City Council Workshop Agenda
Monday, October 03, 2022, 4:30 PM
Council Chambers, 616 NE 4th Avenue

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

To Participate Remotely:
OPTION 1 – Video & Audio (*able to public comment*)
Use Zoom app and Meeting ID – 830 9703 8920; or click https://zoom.us/j/83097038920

OPTION 2 – Audio-only (*able to public comment*)
By phone: 877-853-5257, Meeting ID – 830 9703 8920

OPTION 3 – Observe video & audio (*no public comment*)
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For Public Comment:
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2. On phone – hit *9 to "raise hand"
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CALL TO ORDER

ROLL CALL

PUBLIC COMMENTS

WORKSHOP TOPICS

1. Camas and Washougal School District Capital Facilities Update
   Presenter: Robert Maul, Interim Community Development Director
   Time Estimate: 10 minutes

2. Annual Review Request to Modify Comprehensive Plan and Zoning
   Presenter: Robert Maul, Interim Community Development Director
   Time Estimate: 10 minutes

3. General Sewer Plan Update
   Presenter: Rob Charles, Utilities Manager
   Time Estimate: 15 minutes

4. 2023 Community Development Block Grant (CDBG) Application
   Presenter: James Carothers, Engineering Manager
   Time Estimate: 10 minutes

5. Lakes Management Plan Professional Services Agreement Amendment No. 4
Presenter: Steve Wall, Public Works Director
Time Estimate: 15 minutes

6. City Hall Annex Design Professional Services Agreement
Presenter: Steve Wall, Public Works Director
Time Estimate: 10 minutes

7. American Rescue Plan Act Status Presentation
Presenter: Cathy Huber Nickerson, Finance Director and Debra Brooks, Financial Analyst
Time Estimate: 10 minutes

8. Mayor's 2023-2024 Recommended Budget Presentation
Presenter: Cathy Huber Nickerson, Finance Director and Debra Brooks, Financial Analyst
Time Estimate: 10 minutes

COUNCIL COMMENTS AND REPORTS

PUBLIC COMMENTS

CLOSE OF MEETING

Staff Report

October 3rd, 2022 Council Workshop Meeting

Camas and Washougal School District Capital Facilities Update
Presenter: Robert Maul, Interim Community Development Director
Time Estimate: 10 min

Phone	Email
360.817.7255	rmaul@cityofcamas.us

BACKGROUND: The Camas and Washougal School districts are required to update their capital facility plans periodically. Cities and Counties in turn need to adopt those changes as per RCW36.70A.106.

SUMMARY: The Camas and Washougal School districts are both required to update their adopted capital facility plans. When doing so they must coordinate with all jurisdictions to modify their respective comprehensive plans to comply with state law. The Camas School disctrict has provided a summary and updated capital facility plan that was adopted by the School Board where there is a suggested change to the impact fee amount for residential development within the City of Camas boundaries. The current impact fee collected for each single family dwelling unit and for each dwelling unit in multi-family type development is $5,371. The new impact fee is $6,650. The Washougal School district saw enough decline in enrollment that they will not be collecting impact fees.

EQUITY CONSIDERATIONS:

What are the desired results and outcomes for this agenda item? This is an informational presentation to the City Council for discussion and questions and answers with the Camas and Washougal School districts.

What's the data? What does the data tell us? The data was provided by representatives for the two school districts outlining the current enrollment status for each district as well as corresponding budget implications.

How have communities been engaged? Are there opportunities to expand engagement? The City of Camas is providing the public comprehensive plan process to amend its plan. The two school districts will have conducted their own public outreach programs.

Who will benefit from, or be burdened by this agenda item? Once adopted, Camas School district impact fees will rise, but the Washougal School district will not collect any impact fees.

What are the strategies to mitigate any unintended consequences? N/A

Does this agenda item have a differential impact on underserved populations, people living with disabilities, and/or communities of color? Please provide available data to illustrate this impact. Both school districts are to provide educational services to all members of their respective communities.

Will this agenda item improve ADA accessibilities for people with disabilities? N/A

What potential hurdles exists in implementing this proposal? Some home builders may comment on the increase in the impact fees for the Camas School district.

How will you ensure accountabilities, communicate, and evaluate results? This system has been in place for many years and has operated without any issues.

How does this item support a comprehensive plan goal, policy or other adopted resolution? Yes, this will comply with comprehensive plan policies.

BUDGET IMPACT: This is not a direct impact to the City's budget. The City of Camas collects the impact fees and transfers the funds to the school districts respectively.

RECOMMENDATION: This is a workshop item only. No action to be taken. A future public hearing will be scheduled for formal action.

CAMAS SCHOOL DISTRICT

CAPITAL FACILITIES PLAN

CITY OF CAMAS CITY COUNCIL

OCTOBER 3RD, 2022

LeAnne Bremer,
Attorney
Miller Nash LLP

Jasen McEathron,
Director of
Business Services

Item 1.

OUTLINE

- Background
- Current School Impact Fees
- Capital Facilities Plan – Enrollment vs. Building Capacity
- Impact Fee Considerations
- Resolution No. 21-02 Capital Facilities Plan 2022-28

BACKGROUND

The Washington State Growth Management Act (the "GMA") includes schools in the category of public facilities and services. Camas School District is required by Clark County and the Cities of Camas, Washougal, and Vancouver to adopt a capital facilities plan (CFP) to satisfy the requirements of the GMA and to identify school facilities necessary to meet the educational needs of current and projected enrollment growth for a six-year period.

Clark County Resolution No. 2021-06-01 suspended the need to update our CFP last year due to COVID.

Camas SD contracted with Miller Nash LLC law firm to assist with the preparation of our capital facilities plan.

School impact fees are calculated using methodologies consistent with Chapter 82.02 RCW and local codes, and the School Board adopts the CFP, which establishes the school impact fees; subject to approval by respective jurisdictions.

Item 1.

CURRENT SCHOOL IMPACT FEES

Current Impact Fee Amounts - Clark County Schools

SCHOOL AREA	SFR	Effective date	MFR	Effective date	ADU	Effective date
BATTLE GROUND	$6,397.00	1/1/17	$2,285.00	1/1/17	$571.25	3/1/18
CAMAS	$5,371.00	1/1/17	$5,371.00	1/1/17	$1,342.75	3/1/18
EVERGREEN	$6,432.00	3/18/20	$3,753.00	3/18/20	$938.25	3/18/20
GREEN MOUNTAIN	$3,387.00	9/26/07	N/A	N/A	$846.75	3/1/18
HOCKINSON	$7,790.00	3/18/20	$3,434.00	3/18/20	$858.50	3/18/20
LA CENTER	$3,501.00	3/18/20	$3,104.00	3/18/20	$776.00	3/1/18
RIDGEFIELD	$10,100.00	3/18/20	$10,100.00	3/18/20	$2,525.00	3/18/20
VANCOUVER	$2,880.75	1/1/17	$2,381.93	1/1/17	$595.48	3/1/18
WASHOUGAL	$5,600.00	1/1/17	$5,800.00	1/1/17	$1,450.00	3/1/18
WOODLAND	$5,900.00	3/18/20	$5,900.00	3/18/20	$1,475.00	3/18/20

https://clark.wa.gov/sites/default/files/media/document/2021-11/sfr-impact-fees.pdf

Battle Ground, Camas, Green Mt., Ridgefield, Washougal, & Vancouver updating CFP

Building Capacity Summary

Item 1.

High School	Building Capacity	Portable Capacity	Total Capacity	% Full	Year Enrollment > Capacity
Camas	1,834	310	2,144	87%	2040
Discovery	600	-	600	33%	2030
Hayes Freedom	207		207	69%	2040
	2,641	310	2,951	75%	

High School Class Size = 31; Utilization Rate 83%

Middle School	Building Capacity	Portable Capacity	Total Capacity	% Full	Year Enrollment > Capacity
Liberty	875		875	77%	2028
Odyssey	350		350	85%	2022
Skyridge	825	150	975	73%	2040+
	2,050	150	2,200	77%	

Middle School Class Size = 30; Utilization Rate 83%

Elementary School	Building Capacity	Portable Capacity	Total Capacity	% Full	Year Enrollment > Capacity
Dorothy Fox	552	48	600	79%	2035
Grass Valley	624	48	672	66%	2040+
Helen Baller	576	96	672	78%	2039
Lacamas Lake	600		600	55%	2040+
Prune Hill	504	96	600	71%	2040+
Woodburn	648	48	696	82%	2026
	3,504	336	3,840	72%	

Elementary School Class Size = 24; Utilization of all classrooms

6-Year Plan – Facility Capacity Needs

Project Description	Added Capacity	Estimated Cost	Cost for Added Capacity to Serve Growth
Woodburn Elementary Portable	48	$500,000	$500,000
Odyssey Middle School Addition	100	$15,000,000	$10,000,000
Property Acquisition		$7,000,000	0
Liberty Middle Portable	60	$500,000	$500,000
Middle School Construction	850	$100,000,000	$100,000,000
Leadbetter Campus Improvements for Educational Purpose	500	$87,000,000	0
TOTAL:	**2,158**	**$210,000,000**	**$111,000,000**

IMPACT FEE CONSIDERATIONS

	Current SFR	Current MFR	New Calculated SFR	New Calculated MFR	Board Approved SFR	Board Approved MFR
CAMAS	$5,371	$5,371	**$6,652.48**	**$29,713.38**	$6,650	$6,650

The Single Family Residence (SFR) is fairly consistent with the current SFR. The Multi Family Residence (MFR) calculated fees increased due to these factors:

1. The costs of the facilities
2. Higher assessed values
3. Updated student factors
4. Multi family units of Vancouver & Evergreen generate a high number of students

Item 1.

RESOLUTION NO. 21-02
CAPITAL FACILITIES PLAN 2022-28

Impact Fee discussion:

Single Family Residence (SFR)

2015-21 Calculated Maximum	$5,371
2015-21 Board Adopted	$5,371
2022-28 Calculated Maximum	$6,652.48
2022-28 Board Adopted	$6,650 (May 23rd)

Multi Family Residence (MFR)

2015-21 Calculated Maximum	$10,336
2015-21 Board Adopted	$5,371
2022-28 Calculated Maximum	$29,713.38
2022-28 Board Adopted	$6,650 (May 23rd)

CAMAS SCHOOL DISTRICT 117
RESOLUTION 21-02
CAPITAL FACILITIES PLAN 2022-2028

A Resolution of the Board of Directors (the "Board") of the Camas School District No. 117 (the "District") to adopt a Capital Facilities Plan (the "Plan") for school facilities conforming to requirements of the State Growth Management Act and the Clark County General Policy Plan.

WHEREAS, Districts are required to update their Capital Facilities Plan every six years in compliance with RCW 36.70A (the Growth Management Act); and

WHEREAS, this Plan update was developed by the District in accordance with accepted methodologies and requirements of the Growth Management Act; and

WHEREAS, the proposed impact fees utilize calculation methodologies meet the conditions and tests of RCW 82.02; and

WHEREAS, the District finds that the Plan meets the basic requirements of RCW 36.70A and RCW 82.02; and

WHEREAS, the District conducted a review of the Plan in accordance with the State Environmental Policy Act, state regulations implementing the act, and District policies and procedures;

NOW, THEREFORE BE IT RESOLVED as follows:

1. The 2012 Capital Facilities Plan for the years 2012-2028 is hereby adopted by the District.
2. The Clark County Board of Commissioners is hereby requested to adopt the Plan by reference as part of the capital facilities element of the County's General Policy Plan.
3. The Cities of Camas, Washougal, and Vancouver are hereby requested to adopt the Plan by reference as part of the Capital Facilities Plan element of their respective General Policy Plans.

ADOPTED, this 23rd day of May 2022 at the Regular Meeting of the Board of Directors for Camas School District 117.

CAMAS SCHOOL DISTRICT 117
BOARD OF DIRECTORS

Attest:

Secretary to the Board

CAMAS SCHOOL DISTRICT
CAPITAL FACILITIES PLAN
2022 – 2028

Board of Directors

District I	**Corey McEnry**
District II	**Erika Cox**
District III	**Connie Hennessey**
District IV	**Doug Quinn**
District V	**Tracey Malone**

Interim Superintendent
Doug Hood

Adopted by the Camas School District Board of Directors

May 23, 2022

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I. EXECUTIVE SUMMARY

The Washington State Growth Management Act (the "GMA") includes schools in the category of public facilities and services. The Camas School District ("District") is required by Clark County ("County") and the Cities of Camas, Washougal, and Vancouver ("Cities") to adopt a capital facilities plan to satisfy the requirements of the GMA and to identify school facilities necessary to meet the educational needs of current and projected enrollment growth for a six-year period. Due to the uncertainty of the impact of COVID-19 pandemic on student enrollment and public education and at the request of several school districts, including the District, Clark County suspended until 2022, their four-year update requirement.

The District has prepared a 2022 Capital Facilities Plan ("CFP") to provide the County and the Cities with a schedule and financing program for capital improvement needs over the next six years (2022-2028) to ensure that adequate facilities are available to serve new growth and development. The 2022 CFP includes the following elements:

- A description of standard of service and space requirements for educational programs (Section II)
- An inventory of existing capital facilities owned by the District (Section III)
- Future enrollment projections for each grade span (Section IV)
- A forecast of proposed capacities of expanded or new capital facilities over the next six years based on the inventory of existing facilities and the standard of service (Section V)
- A six-year plan for financing capital facilities within projected funding capacities, which identifies sources of public funds for such purposes. The financing plan separates projects and portions of projects which add capacity from those which do not, since the latter are generally not appropriate for impact fee funding (Section VI)
- A calculation of impact fees based on the formula in the County and City impact fee ordinances and supporting data substantiating such fees (Section VII)

In developing this CFP, the District used the following guidelines:

- The District will use information from recognized sources, such as professional demographers and planners, County and City adopted land use plans and County GIS data.
- The District will use data it generates from reasonable methodologies.
- The CFP and the methodology to calculate the impact fees will comply with the GMA and County and City codes.
- The six-year facility needs are based on an enrollment forecast that takes local development trends into account.
- The District plans to construct permanent/bricks and mortar facilities for its students and will develop a CFP to accomplish that objective. At the same time, the District expects there will be a time period when some of the students that the District serves will be housed in portables. Housing students in portables, temporarily, is necessary to qualify for state funds that are needed to build new schools.

Camas is a financially and academically sound school district. The 57 square mile Camas School District serves the majority of the Camas Urban Growth Area, a large section of the Washougal Urban Growth

Area, and a smaller portion of the Vancouver Urban Growth Area and rural Clark County. The District serves residents from the Cities of Camas, Washougal, Vancouver and unincorporated rural Clark County. It is bordered by Evergreen School District to the west, Hockinson School District to the north, Washougal School District to the east, and the Columbia River and the state line to the south.

The District served a population of 7,412 students in 2019 (October 1, 2019 enrollment). Due to the statewide closure of schools during the COVID-19 pandemic, and associated loss of public school enrollment, the District served a population of 7,055 students in 2020 (October 1, 2020 enrollment) and 7,045 students in 2021 (October 1, 2021 enrollment). The District expects no further enrollment loss and a recovery over 4-5 years to pre-pandemic enrollment.

For purposes of facility planning, the CFP considers grades K-5 as an elementary school, grades 6-8 as a middle school, and grades 9-12 as a high school. The District has six elementary schools; two standard middle schools and a third, smaller, application-based middle school; and a large comprehensive and two, smaller application-based high schools. In addition, the District serves Camas Connect Academy students in grades K-12 in an online platform, pre-school special needs students at the Heights Learning Center and Camas High School, and students aged 18-21 in the Transition Program.

In February 2016, voters approved a bond measure which included the funding for the projects noted below. Construction of the replacement Lacamas Lake Elementary School, the purchase of a 38.2 acre site and the associated remodel of a commercial building to house the new Odyssey Middle School, and the construction of the new Discovery High School on the same site have increased capacity to serve forecast growth.

School facility and student capacity needs are dictated by a complex matrix of regulatory mandates, educational program components, collective bargaining agreements, and community expectations, more fully described in Section II. The District's existing capital facilities are summarized in Section III. In addition, the District owns 32 portable classrooms located at school facilities – 24 of which currently house approximately 9.6%, or 680 students; and 8 additional portable classrooms that are available to accommodate enrollment growth.

Between 2014 and 2019, enrollment growth within the District grew an average 3.1% per year, compared to the countywide rate of 2.0%. A total of 847 students were added to Camas School District during that time. The District expects to continue to see an increase in enrollment over time, although at a slower rate. Much of the land within the District and urban growth boundaries has yet to be developed, and there continues to be market interest in housing development in Camas and Washougal. Future K-12 enrollment is projected to increase by an average 1.3% per year, or 688 students over the next 7 years (see Section IV). Thanks to the 2016 Bond, which provided an increase in educational facility capacity of 192 students at the elementary level, 360 students in middle school, and 600 students in high school, many of the projected number of students by 2028 can be accommodated in the District's existing educational facilities and portable classrooms, except that there will be a need to increase capacity at the middle school level, and slightly at elementary school level.

The calculated maximum allowable impact fees for the District are $6,652.48 per single family residence and $29,713.38 per multi-family residence (**Appendix A**).

II. DISTRICT EDUCATIONAL PROGRAMS AND STANDARDS OF SERVICE

School facility and student capacity needs are dictated by the types and amounts of space required to accommodate the District's adopted educational program. Quality education plays a vital role in growing a strong local economy. To provide quality education, the District must have quality facilities to serve as the supporting space for developing the whole child within a community to prepare them for a competitive world. The educational program components which typically drive facility space needs include grade configuration, optimum facility size, class size, educational program offerings, classroom utilization and scheduling requirements.

Student enrollment is determined by population growth, birth rates, and housing and demographic characteristics of the District. Individual schools within the District may or may not follow the overall District pattern shared in this report. For example, the majority of the new housing in the past decade has been in the central and western portion of the District and the schools in these areas saw the most enrollment growth. As these areas have built out, future housing is proposed more in the outer ring of the District, predominantly to the north and east. This affects the balance of student enrollment and individual school facility capacity in ways that are not reflected in the overall summary.

In addition to student enrollment, other factors such as collective bargaining agreements, government mandates, and community expectations also affect classroom space requirements. Basic education programs are augmented by other programs such as special education, physical education, and art and music. These programs can have a significant impact on the available student capacity of school facilities.

The District's current programs and educational standards are summarized below. The program and educational standards may vary during the six-year CFP planning horizon. Absent significant changes in factors that are beyond the District's control, the District will provide the following programs and standards of service in 2022 through 2028. If significant changes occur that require new facilities or improvements beyond what is identified in this CFP, the District will prepare and submit an updated CFP.

A. Elementary Educational Standards
- Elementary school capacity is calculated utilizing classroom spaces containing a basic education teacher and his/her complement of students. All students are integrated at some time during the day in a basic education classroom and are included in the total enrollment count. All students are pulled out to attend additional programs (which may also be held in classrooms, if there is no designated space available). Building capacity calculations do not include pull-out program areas such as special education learning support centers, resource rooms, technology labs, music instruction spaces, and gymnasiums.
- Class sizes for grades K-5 are targeted not to exceed 24 students per class.
- When feasible K-3 class sizes are reduced to maximize enhanced funding from the State.

B. Middle School Program Standards

- Middle school capacity is calculated utilizing the number of basic education teaching stations. It is not possible to achieve 100% utilization of all teaching stations throughout the day due to schedule conflicts, the need for specialized rooms for certain programs and the need for teachers to have work space during their planning period. A utilization factor of 83% is used to reflect the actual use of the building. Building capacity calculations do not include pull out program areas such as special education learning support centers, resource rooms, and technology labs.
- Class sizes for grades 6-8 are targeted not to exceed 30 students per class.

C. High School Program Standards

- High school capacity is calculated utilizing the number of basic education teaching stations. It is not possible to achieve 100% utilization of all teaching stations throughout the day due to schedule conflicts, the need for specialized rooms for certain programs and the need for teachers to have work space during their planning period. A utilization factor of 83% is used to reflect the actual use of the building. Building capacity calculations do not include pull out program areas such as special education learning support centers, resource rooms, and technology labs.
- Class sizes for grades 9-12 are targeted not to exceed 31 students per class.

III. CAPITAL FACILITIES INVENTORY

The facilities inventory serves to establish a baseline for determining facilities needed to accommodate future demand at acceptable levels of service. This section provides an inventory of capital facilities owned and operated by the District including schools, portables, undeveloped land, and support facilities. School capacity is based on the space requirements for the District's educational programs as outlined in Section II.

A. Elementary Schools

Elementary School	Location	Year of Occupancy	Building SF	Capacity	Teaching Stations
Dorothy Fox (K-5)	2623 NW Sierra St Camas WA 98607	1982/2000/ 2011	62,237	552	23
Grass Valley (K-5)	3000 NW Grass Valley Dr Camas WA 98607	2009	70,023	624	26
Helen Baller (K-5)	1954 NE Garfield St Camas WA 98607	2009	64,417	576	24
Lacamas Lake (K-5)	4825 North Shore Blvd Camas WA 98607	2018	74,330	600	25
Prune Hill (K-5)	1602 NW Tidland St Camas WA 98607	2001	59,130	504	21
Woodburn (K-5)	2400 NE Woodburn Dr Camas WA 98607	2013	72,857	648	27
TOTALS:			**402,994**	**3,504**	**146**

B. Middle Schools

Middle School	Location	Year of Occupancy	Building SF	Capacity	Teaching Stations
Liberty (6-8)	1612 NE Garfield St Camas WA 98607	1937/1952/1969/ 1985/1995/2006	121,047	875	35
Odyssey (6-8)	5001 NW Nan Henriksen Way Camas WA 98607	2016 (built in 1996)	54,140	350	14
Skyridge (6-8)	5220 NW Parker St Camas WA 98607	1996	112,133	825	33
TOTALS:			**287,320**	**2,050**	**82**

C. High Schools

High School	Location	Year of Occupancy	Building SF	Capacity	Teaching Stations
Camas (9-12)	26900 SE 15th St Camas WA 98607	2003/2011	241,621	1,834	71
Discovery (9-12)	5125 NW Nan Henriksen Way Camas WA 98607	2018	92,000	600	24
Hayes Freedom (9-12)	1919 NE Ione St Camas WA 98607	2010	20,500	207	8
TOTALS:			**354,121**	**2,641**	**103**

D. Portables Inventory

Facility Type	Available Portable Classrooms	Capacity
Elementary Schools	14	336
Middle Schools	6	150
High Schools	12	310
TOTALS:	**32**	**796**

E. Support Facilities

Type	Location
Grounds Shop, Bus Maintenance and Warehouse (1963/2001)	1707 NE Ione St Camas WA 98607
Transportation Center (2001/2012)	1125 NE 22nd Ave Camas WA 98607
JD Zellerbach Administration Center (1967/1974/1985/1998/2010)	841 NE 22nd Ave Camas WA 98607
Doc Harris Stadium (2010)	1125 NE 22nd Ave Camas WA 98607
The Heights Learning Center (1963, 1984, 1998, 2008, 2018)	4600 NE Garfield Street Camas WA 98607
Jack, Will & Rob Family Resource Center (2002, 2017)	2033 NE Ione St Camas WA 98607
Transition House (remodeled 2009)	612 NE 2nd Ave Camas WA 98607

F. Land Inventory

The district owns the following under- and undeveloped sites:

- 57.6 acres located at 2815 NW Leadbetter Drive, Camas, WA 98607 – site includes a commercial office building
- 79.9 acres located at the northeast corner of NE 28th Street and NE 232nd Ave
- 19.6 acres located northwest of the intersection of NW Pacific Rim Blvd and NW Parker Street

IV. STUDENT ENROLLMENT PROJECTIONS

The District's six-year enrollment projection is based on a forecast prepared by Eric Hovee of E.D. Hovee & Company, LLC in February 6, 2020 and updated in December, 2021.

The approach used in making the updated enrollment forecast included the following:

- Kindergarten (K) enrollment is forecast based on the population of each school area (and expected population growth) together with birth rate data from five years previous using an age-cohort methodology. Data required for the K-level forecast includes projections of population growth, women of childbearing age and age-specific fertility rates.

- Actual enrollment patterns from prior years are used as a basis for projecting future enrollment for grades 1-12. For example, the number of students in a particular grade as of October 1, 2019 are promoted into the next grade level for 2020 (adjusting for expected population growth together with gains or losses typically associated with a particular grade-to-grade change for each grade level at each individual school). The pattern for the District is for additional students to join as the grades increase, especially at the transition from elementary to middle and from middle to high school.
- The 2021/2022 school year enrollment is based on the October 1, 2021 enrollment data.
- Economic growth impacts, land use and zoning provisions, buildable lands inventory, and new residential developments are taken into account.
- The student generation rates by grade levels in the District for single family homes for the last six years is 0.237 Elementary School, 0.143 Middle School, and 0.202 High School students/new unit. Since there have been limited multi-family units constructed in the District over the last six years, the County code states that County wide averages should be used but the District is using a composite from larger districts with a significant amount of multi-family units. Accordingly, the District will apply a 6-year generation rate for the other larger school districts in Clark County (Battle Ground, Evergreen, and Vancouver). The composite weighted average for these three districts combined is a multi-family generation rate of 0.554 Elementary School, 0.344 Middle School, and 0.460 High School students/new unit.

A. Projected Enrollment 2022-2028 (Headcount)

Grade	Actual 2019	Actual 2020	Actual 2021	2022	2023	2024	2025	2026	2027	2028
K-5	3,117	2,852	2,866	2,954	2,904	3,071	3,041	3,183	3,231	3,308
6-8	1,863	1,737	1,735	1,721	1,758	1,721	1,790	1,766	1,862	1,877
9-12	2,432	2,389	2,444	2,428	2,484	2,453	2,457	2,515	2,494	2,549
TOTALS:	**7,412**	**6,978**	**7,045**	**7,103**	**7,146**	**7,245**	**7,288**	**7,464**	**7,587**	**7,734**

V. CAPITAL FACILITIES NEEDS

Facility needs for purposes of the Growth Management Act and impact fees are based on existing capacity and forecast enrollment. The 2028 Facility needs are shown in the table below and the amount of the facility need that is attributed to forecast growth is described under the table.

A. Forecast Facility Capacity Needs

- Elementary Schools: The enrollment forecast shows an increase of 442 students.
- Middle Schools: The enrollment forecast for middle school shows an increase of 142 students.
- High Schools: The enrollment forecast for high school shows an increase of 105 students.

- The projected number of students by 2028 indicate the need for an additional middle school and elementary school capacity. High school enrollment can be accommodated by the additions in our 2016 bond to our existing educational facilities.

Under the District's 2016 Bond Capital Program, the District purchased property that contained a commercial building in 2016, which was remodeled in 2017 to accommodate educational use and can serve 350 middle school students. In 2018, the District completed construction of a new high school that has a capacity to serve 600 students. In addition, the District completed construction of a replacement elementary school in 2018 to increase the capacity at the elementary level by 192 students. The District also added two double portable classrooms to the District inventory at the elementary level in 2019 and 2020 to address overcrowding at individual schools. The cost to purchase this land and build these schools and portables, which are now available to serve forecast growth are listed below as Facility Capacity Needs.

The District added capacity over the last 4-5 years that is available to serve forecast growth. New development, which places demands on schools will use the capacity that has been provided, and will contribute a small portion of the cost through the payment of school impact fees.

B. 6-Year Plan – Facility Capacity Needs

Project Description	Added Capacity	Estimated Cost	Cost for Added Capacity to Serve Growth
Woodburn Elementary Portable	48	$500,000	$500,000
Odyssey Middle School Addition	100	$15,000,000	$10,000,000
Property Acquisition		$7,000,000	0
Liberty Middle Portable	60	$500,000	$500,000
Middle School Construction	850	$100,000,000	$100,000,000
Leadbetter Campus Improvements for Educational Purpose	500	$87,000,000	0
TOTAL:	**2,158**	**$210,000,000**	**$111,000,000**

- Cost attributed to forecast growth is the proportionate share of the total cost to construct the improvement that is equal to forecast growth. Forecast growth at the elementary school level is 442 and the added capacity is 48. Because two middle schools will be at and over capacity during the 6-year period of this plan, the entire new middle school, addition, and portable are needed for growth. The estimated total cost includes all the costs to construct the improvement. Architect, engineer, professional services, furniture/fixtures/equipment, permit and owner contingency costs have been excluded from the cost allocated to serve forecast growth.
- Costs are estimates.

- The 2016 bond program also included replacement facilities and capital renewal projects that are not listed above. A detailed list of all bond improvements with project specific costs is on file with the District.
- To accommodate growth on a short term and immediate basis, the District may purchase and utilize portable classrooms, and this plan incorporates those facilities and the equipment and furniture necessary to equip these classrooms in the District's facility plan. Impact fee revenue can be available to fund portable facilities if these facilities are needed to serve growth.

VI. CAPITAL FACILITIES FINANCE PLAN

A. Six Year Financing Plan

Facility Capacity Need	Total	Estimated Impact Fees	State Construction Funds	Bonds
Secured	**$4,000,000**	$4,000,000	$0	$0
Unsecured	**$111,000,000**	$3,000,000	$13,000,000	$95,000,000

*Financing plan does not include all potential facility needs identified in table V. B. above.

The total cost for all 2016 bond projects, including facility improvements and property acquisition was $137.2 million dollars. Funding for planned improvements is typically secured from a number of sources including voter approved bonds, limited general obligation bonds, capital levies, state match funds and impact fees. The following information explains each of the funding sources in greater detail.

Capital Levies
In 2021, District voters approved a $11.5 million dollar Capital Levy to fund technology and necessary capital renewal projects; including roof replacements, HVAC replacements, fire protection upgrades, and other capital maintenance.

School Construction Assistance Program (SCAP)
The School Construction Assistance Program (SCAP) provides funding assistance to school districts that are undertaking a major new construction or modernization project. Funds primarily come from the Common School Construction Fund (the "Fund"). School districts may qualify for State construction funds for specific capital projects based on eligibility requirements and a state prioritization system. Based on the District's assessed valuation per student and the formula in the State regulations, the District is currently eligible for state construction funds for new schools at the 63.77% match level. The District received $13,065,000 for construction of the new high school.

Impact Fees
The collection of school impact fees generates partial funding for construction of public facilities needed to accommodate new development. School impact fees are collected by the cities and County on behalf of the District at the time plats are approved or building permits are issued. Impact fees are calculated based on a formula, which includes the portion of District construction resulting in increased capacity in schools.

Anticipated property acquisition and new construction is based on the enrollment forecast, capacity, the District's educational standards and the community's support of finance tools to fund improvements.

VII. SCHOOL IMPACT FEES

The Growth Management Act (GMA) authorizes jurisdictions to collect impact fees to supplement funding of additional public facilities needed to accommodate new development. Impact fees cannot be used for the operation, maintenance, repair, alteration, or replacement of existing capital facilities used to meet existing service demands.

Local jurisdictions in Clark County have adopted impact fee programs require school districts to prepare and adopt Capital Facilities Plans. Impact fees are calculated in accordance with the jurisdiction's formula, which is based on school facility costs to serve new growth. The formula allocates a portion of the cost for new facilities to a single family or multi-family residence that create the demand (or need) based on a student factor, or the average number of students that live in new single family or multi-family homes. The formula also provides a credit for SCAP funds the District receives and the projected future Bond Proceeds (or property taxes) that will be paid by the owner of the home.

The District's impact fees have been calculated utilizing the formula in the Clark County and the Cities of Camas, Washougal, and Vancouver Impact Fee Ordinances. Application of the formula is shown in Appendix A which follows on the next page.

In accordance with the school impact fee calculation in Appendix A, the District's maximum allowable school impact fees are:

$6,652.48 per single family residence
$29,713.38 per multi-family residence

The District Board of Directors, at its May 23, 2022 meeting, recommends collecting school impact fees in the following amounts:

$ 6,650.00 per single family residence
$ 6,650.00 per multi-family residence

Camas School District **APPENDIX A**

Single-Family			
Elementary	Middle School		Formula
$ 500,000.00	$ 110,500,000.00		Facility Cost
48	1010		Additional Capacity
$10,416.67	$ 109,405.94		Cost per Student (CS)
0.237	0.143		Student Factor (SF)
$2,468.75	$15,645.05		CS x SF
$246.83	$246.83		Boeck Index
90	117		OSPI Sq Ft
63.77%	63.77%		State Match Eligibility %
None available	$2,633.52		State Match Credit (SM)
$2,468.75	$13,011.53		CS x SF – SM
		$15,480.28	Cost per Single Family Residence
		LESS	Tax Credit
		0.0220	Average Interest Rate
		0.243108277	Tax Credit Numerator
		0.027348382	Tax Credit Denominator
		8.889311106	Tax Credit Multiplier (TCM)
		$543,752.00	Average Assessed Value (AAV)
		$4,833,580.69	TCM x AAV
		0.00158347	Tax Levy Rate (TLR)
		$7,653.83	TCM x AAV x TLR = (TC)
		$7,826.45	Cost per Single Family Residence - Tax Credit
		LESS	15% reduction (A)
		$6,652.48	Calculated Single Family Fee Amount
		$6,650.00	Recommended Fee Amount
Multi-Family			
Elementary	Middle School		Formula
500,000.00	$ 110,500,000.00		Facility Cost
48.00	1010		Additional Capacity
$10,416.67	$ 109,405.94		Cost per Student (CS)
0.554	0.344		Student Factor (SF)
$5,770.83	$37,635.64		CS x SF
$246.83	$246.83		Boeck Index
90	117		OSPI Sq Ft
63.77%	63.77%		State Match Eligibility %
None available	$6,335.18		State Match Credit (SM)
$5,770.83	$31,300.47		CS x SF – SM
		$37,071.30	Cost per Multi-Family Unit
		LESS	Tax Credit
		0.0220	Average Interest Rate
		0.243108277	Tax Credit Numerator
		0.027348382	Tax Credit Denominator
		8.889311106	Tax Credit Multiplier (TCM)

		$150,212.00	Average Assessed Value (AAV)
		$1,335,281.20	TCM x AAV
		0.00158347	Tax Levy Rate (TLR)
		$2,114.38	TCM x AAV x TLR = (TC)
		$34,956.92	Cost per Multi-Family Unit - Tax Credit
		LESS	15% reduction (A)
		$29,713.38	Calculated Multi-Family Unit Fee Amount
		$6,650.00	Recommended Fee Amount

WASHOUGAL SCHOOL DISTRICT

4855 EVERGREEN WAY WASHOUGAL. WA 98671
PH: 360.954.3000 FAX: 360.835.7776

WASHOUGAL SCHOOL DISTRICT
CAPITAL FACILITIES PLAN

2022-2027

BOARD OF DIRECTORS

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SUPERINTENDENT

Dr. Mary Templeton

DIRECTOR OF BUSINESS AND OPERATIONS

Kris Grindy

Adopted by the Washougal School District Board of Directors
May 24, 2022

I. INTRODUCTION

A. Purpose of the Capital Facilities Plan

The Washington State Growth Management Act (the "GMA") includes public school facilities and services that must be provided as cities and counties plan for growth. School districts have adopted capital facilities plans to satisfy the requirements of the GMA and to identify additional school facilities necessary to meet the educational needs of the growing student populations anticipated in their districts.

The Washougal School District (the 'District") has prepared this Capital Facilities Plan (the "CFP") to provide Clark County (the "County") and the cities of Camas and Washougal (the "Cities") with the District's anticipated capital facility needs and the District's schedule and financing plan for those improvements over the next six years (2022-2027).

In accordance with the Growth Management Act and the County and City Impact Fee Ordinances, this CFP contains the following required elements:

- The District's standard of service, which is based on program year, class size by grade span, number of classrooms, types of facilities, and other factors identified by the District, including teacher contracts and funding requirements,

- An inventory of existing capital facilities owned by the District, showing the locations and capacities of the facilities, based on the District's standard of service.

- Future enrollment forecasts for each grade span (elementary, middle, and high schools).

- A forecast of the future needs for capital facilities and school sites based on the District's enrollment projections

- The proposed capacities of expanded or new capital facilities over the next six years based on the inventory of existing facilities and the standard of service.

- A six-year plan for financing capital facilities within projected funding capacities, which clearly identifies sources of public money for such purposes. The financing plan separates projects and portions of projects that add capacity from those that do not, since the latter are generally not appropriate for impact fee funding.

B. Overview of the Washougal School District

The Washougal School District is located in southwest Washington and serves residents of Washougal, Camas and unincorporated Clark County, as well as residents in the Columbia River Gorge who live in the Cape Horn area of Skamania County. The District map reveals a long, narrow band of land that extends from the Columbia River on the south all the way north to the White Pass School District in Lewis County. This geographical configuration gives Washougal the unusual feature of being incorporated into two counties (Clark and Skamania) and bordering two other counties to the north and west (Cowlitz and Lewis). The District is bordered on the west by seven school districts—Camas, Hockinson, Battle Ground, Woodland, Kalama, Kelso, and Toutle Lake School Districts. It is bordered on the east by the Skamania School District. The northern end of the District includes the uninhabited wilderness around Mt. St. Helens in the Gifford Pinchot National Forest. One of the District's schools, Jemtegaard Middle School, is located within the national boundary of the Columbia River Gorge Scenic Area.

As of March 2022, the District serves a population of 2,903 students. Of the 2,903 students, 1,193 students attend classes in 4 elementary schools (grades K-5), 739 students attend classes in two middle schools (grades 6-8), and 971 students attend classes in one high school and one virtual alternative school (grades K-8). For purposes of facility planning this CFP considers grades K-5 as elementary, grades 6-8 as middle school, and grades 9-12 as high school.

In April 2022, the District re-evaluated enrollment forecasts and student generation rates based on recognized methodologies including trends in land development, housing starts, and residential construction and that data is reflected in this plan.

The most significant issues facing the District in terms of providing classroom capacity and maintaining support facilities to accommodate existing and projected demands are:

- The District will complete the OSPI Study and Survey in 2022-2023 and present results and preliminary understandings that can be drawn upon in the future.

- The District owns property known as the Kerr property, which is suitable for a new elementary and a new middle school. The Kerr property was paid off in 2013. Purchase of additional land for future school facility sites is currently being studied.

- The District Administrative Services Center has no additional office space available.

- District growth has been experienced moderate residential growth at a significantly lower pace than during the mid-2000s.

In summary, the District recognizes that quality schools are essential to a positive, growing community. People gravitate to communities with great schools, and businesses thrive in communities where there is pride and accomplishment associated with educational opportunity. Washougal School District is engaged in long-range educational, fiscal and operational planning that will benefit the students, families and community members it serves.

II. DISTRICT EDUCATIONAL PROGRAMS AND STANDARDS OF SERVICE

To provide quality education, the District must have quality facilities. Facilities provide the physical structure necessary for achieving educational goals established by the Board of Directors.

School facility needs are dictated not only by student enrollment, but also by the space required to accommodate the District's adopted educational program. Beyond regular education, the District also provides specialized programs with unique facility needs such as special education, dual language programs, and technology education, transitional kindergarten, early learning programs and after school programs.

The District's program and educational standards for 2022 are summarized below. The program and educational standards may vary during the six-year CFP window. Absent significant changes in factors that are beyond the District's control, the District will provide the following programs and standards of service in 2022, 2023, 2024, 2025, 2026, and 2027. If significant changes occur that require new facilities or improvements, beyond what is identified in this CFP, the District will prepare and submit an updated CFP to the County and Cities.

A. District-wide Educational Programs

The District's core services and program offerings include the following:

- Elementary schools provide education in all core subject areas including reading, writing, math, social studies and science. In addition, students participate in P.E., music, art and library programs.

- Middle schools provide instruction in the core disciplines of English, mathematics, social studies, science, P.E., music, and art. Students have elective offerings available including robotics, music and art. An extracurricular sports program is offered after school to students in 7th and 8th grades.

- High schools provide course work including English, history, science, mathematics, P.E., music, and art. Additional offerings include career and technical education programs, career counseling, access to Running Start at Clark College, and Advanced Placement courses. An extracurricular program includes clubs, athletics, arts, etc.

- The District provides science classroom space supporting advanced coursework at the secondary level that require water, sinks, gas, hoods, safety equipment, etc. Schools are working to meet expanded science standards and this will require spaces that cannot typically be met by adding portables.

- The District will need to upgrade elementary, middle school, and high school spaces supporting health, fitness, fine arts and extracurricular activities. This includes replacing the turf and gym floor at the high school.

- Technology access is necessary and expectations are increasing. Technology (either within the classroom or in dedicated labs) takes extra space that is not calculated in current state square footage allowances, but is necessary for student learning. Technology support and infrastructure needs are also increasing including the installation of fiber optic cable to Jemtegaard and Canyon Creek Middle School as well as Cape Horn Elementary.

- Beginning in the fall of 2022, the District changed to add Transitional Kindergarten program. This change has required two additional classroom spaces at Hathaway elementary school.

- Library/Media demands are crucial. In an information driven environment, access to knowledge through appropriately sized library/media spaces is essential.

- Extra-curricular activities need space in order to be supported properly with growing student populations.

- Supplementary services in core academic areas and multiple pathways that prepare students for a broader range of post-secondary learning opportunities require additional space and spaces that are modernized to reflect industry standards to replicate the real life working environments for our students to gain quality learning experiences in these post-secondary fields.

In addition to the above core educational programs, the following support services are essential to the District's educational program:

- Given current enrollment, the core facilities are sufficient at all schools except Hathaway Elementary School where the addition of three portable modular classrooms is beyond the capacity.

- Maintenance and warehouse support facilities are a necessary component in the District operations.

The following special services are also required to meet the needs of special populations:

- Special Education programs are provided at all schools within the District. Special needs program standards change year to year as a result of various state and Federal regulation adjustments. Changes may also be prompted by research-based modifications to programs, class sizes, and the changes in the population of students eligible for services. Modifications in school facilities are sometimes needed to meet the unique needs of individual students or cluster small groups of students with similar needs.

- Federal and state programs, including Title 1 Reading and Math, Highly Capable, and Bilingual are required programs with limited funds that do not cover the expense of adding facilities as needed to support the programs.

- The District’s early learning program is housed in five classrooms across the District, one or two classrooms at each elementary school.

B. Elementary Educational Standards

The following District educational standards of service affect elementary school capacity:

- Class sizes for grades K-3 are targeted not to exceed 24 students per class.
- Class sizes for grades 4 and 5 are targeted not to exceed 26 students per class.
- Music instruction will be provided but in separate (pull-out) classrooms. Physical education is provided in a separate area.
- All elementary schools have a library/media resource center.
- A standard for technology is being developed for elementary classrooms.
- Special education, Title I and LAP (Learning Assistance Program) instruction is provided for some students in classrooms that are separate from regular teaching stations. Class sizes in these programs tend to be small, usually not more than 15 students.

C. Middle and High School Program Standards

The following District educational standards of service affect middle and high school capacity:

- Class sizes for grades 6-8 are targeted not to exceed 28 students per class.
- Class sizes for grades 9-12 are targeted not to exceed 29 students per class.
- Music, art, PE, drama, and career and technical education classes are provided in separate instructional space.
- Counseling and career center programs are provided in separate spaces.
- A standard for technology is being developed for secondary classrooms. Technology labs and distance learning labs are provided in separate spaces.
- Each middle and high school has a separate library/media resource center.

III. CAPITAL FACILITIES INVENTORY

The facilities inventory serves to establish a baseline for determining the facilities that will be necessary to accommodate future demand (student enrollment) at acceptable levels of service. This section provides an inventory of capital facilities owned and operated by the District including schools, portables, and support facilities.

A. Schools

The District maintains four (4) elementary schools, two (2) middle schools, one (1) high school, and one (1) alternative school. The elementary schools serve grades K-5, middle schools serve grades 6-8, and the high school serves grades 9-12. Presently the alternative school serves grades K-8 virtually.

Table 1 shows the name, number of teaching stations and student capacity for the elementary schools based on the District's standard of service described above.

Table 1: Elementary School Inventory 2021/22

Four (4) Elementary Schools	Total Bldg. Sq. Ft.	Teaching Stations	Student Capacity	2021/22 Enrollment
Gause Elem. 1100 34th Street, Washougal, Washington 98671	56,196	25	625	275
Hathaway Elem. 630 24th Street, Washougal, Washington 98671	48,901	23	575	266
Cape-Horn Skye 9731 Washougal River Road, Washougal, WA 98671	43,838	21	525	286
Columbia River Gorge 35300 SE Evergreen Hwy, Washougal, WA 98671	63,883	28	700	330
Total	212,818	97	2,425	1,157

Table 2 shows the name, number of teaching stations and student capacity of the two (2) middle schools based on the District standard of service described above.

Table 2: Middle School Inventory 2021/22

Two (2) Middle Schools	Total Bldg. Sq. Ft.	Teaching Stations	Student Capacity	2021/22 Enrollment
Canyon Creek MS 9731 Washougal River Road, Washougal, Washington 98671	46,609	15	420	231
Jemtegaard MS 35300 SE Evergreen Hwy, Washougal, WA 98671	58,483	22	616	464
Total	105,092	37	1,036	695

Table 3 shows the name and number of teaching stations and student capacity of each high school based on the District standard of service described above.

Table 3: High School Inventory 2021/22

High Schools	Total Bldg. Sq. Ft.	Teaching Stations	Student Capacity	2021/22 Enrollment
Washougal HS 1201 39th Street, Washougal, Washington 98671	150,471	42	1,218	974
Excelsior 1201 39th Street, Washougal, Washington 98671	8,996	4	116	Included in above number
Total	159,467	46	1,334	974

Student capacity was determined based on the number of teaching stations within each building and the space requirements of the District's current educational programs and standards of service. Student capacity as noted in Tables 1, 2, and 3 does not include capacity that is currently provided in portables at each school.

B. Portables

Portable classrooms are used on an interim basis to house students until funding can be secured to construct permanent classrooms. To accommodate future growth on a short term and immediate basis, the Washougal School District may purchase and utilize portable classrooms.

The District currently uses a total of 7 dual classroom portables. Of the 7 dual classroom portables (14 teaching stations), 12 teaching stations are used for basic education and early learning instructional classrooms. Table 4 identifies the total number of portables at elementary school sites distinguishing between the number that are used to provide interim capacity (as teaching stations) and those are used for special programs or to address other educational needs.

Table 4: Portables Inventory

Facility Type	**Number of Portables Number of Classrooms**	**Number of Classrooms Used as Teaching Stations**	**Number of Students Housed in Portable Classrooms**
Elementary Schools	7 Portables 14 Classrooms	12 teaching stations	336
TOTAL	7/14	12	336

C. Support Facilities

In addition to schools, the District owns and operates additional facilities that provide special programs and operational support functions to the schools. An inventory of these facilities is provided in Table 5.

Table 5: Support Facility Inventory

Facility	Location
Early Learning and Community Education Center	630 24th Street, Washougal, WA 98671
Administrative Service Center	4855 Evergreen Way, Washougal, WA 98671
Maintenance Facility/ Warehouse	4855 Evergreen Way, Washougal, WA 98671
Fishback Stadium	1201 391 Street, Washougal, WA 98671
Transportation Facility	995 E Street, Washougal, WA 98671
WLA Alternative Learning Center	9731 Washougal River Rd., Washougal, WA 98671

IV. STUDENT ENROLLMENT PROJECTIONS

A. Existing Enrollment

The District's enrollment by grade level in March 2022 was 2,903 students. Of the 2,903 students, 1,193 were enrolled in elementary schools, 739 were enrolled in middle schools and 971 were enrolled in high schools.

B. Projected Student Enrollment 2022-2027

The District's six-year enrollment projections are based on a report from OSPI Report 1049. The following table shows existing enrollment and the District's six-year enrollment forecast by grade level bands. As reflected in Table 6a, the District is forecasting an decrease of 11 elementary students, 156 middle school students and 172 high school students.

The District's six-year enrollment projections are also based on a report from Johnson Economics Demographer Report as a baseline. The following table shows existing enrollment and the District's six-year enrollment forecast by grade level bands. As reflected in Table 6b, the District is forecasting as a baseline of an increase of 151 elementary students, decrease 77 middle school students and decrease of 139 high school students.

Table 6a: ICOS Enrollment Forecast

Grade	2021	2022	2023	2024	2025	2026	2027
Total K-5	1,200	1,193	1,187	1,188	1,184	1,211	1,189
Total 6-8	741	690	635	602	597	562	585
Total 9-12	989	1,001	991	963	928	876	817
TOTALS	2,930	2,884	2,813	2,753	2,709	2,649	2,591

Table 6b: Demographer Enrollment Forecast Baseline

Grade	2021	2022	2023	2024	2025	2026	2027
Total K-5	1,198	1,269	1,290	1,308	1,319	1,344	1,349
Total 6-8	739	701	664	641	649	635	662
Total 9-12	1,038	1,097	1,095	1,054	993	947	899
TOTALS	2,975	3,067	3,049	3,003	2,961	2,926	2,910

Table 8: Planned Improvement and Facility Costs to Address Needs

Project Description	Cost Estimate	Added Capacity	Cost for Added Capacity
Portables (3)	$1,200,000	312 [2 & 3]	$1,200,000
Future School Site (4)	$1,000,000	TBD [1]	$1,000,000
Maintenance Facility/Warehouse	$1,400,000	In response to growth	$1,400,000
Technology Infrastructure	$1,000,000	In response to growth	$1,000,000
TOTAL	$4,600,000		$4,600,000

1. Cost for future school site represents a portion of the total cost of the project and would include State SCAP and local dollars within the financing package.

2. Portables provide a temporary interim capacity and not treated as permanent facilities that add capacity. Additional capacity will be determined when the type of school and capacity needs for that school are determined.

3. To accommodate growth on a short term and immediate basis, the District may purchase and utilize portable classrooms and this plan incorporates those facilities and the equipment and furniture necessary to equip these classrooms in the District's project list. Impact fee revenue can be available to fund portable facilities if these facilities are needed to serve growth.

4. District has an option on Tax Parcel 986039-602 (31 acres), which must be included in the Washougal Urban Growth Area to be developed. If not included, the District will explore other sites.

V. CAPITAL FACILITIES FINANCE PLAN

A. Six-Year Finance Plan for Planned Facility Improvements

The total cost for the above planned and needed improvements is $4,600,000. Funds for the improvements are identified in Table 9A and 9B below.

Table 9A: Secured Finance Plan

Type	**Amount**
Impact Fees (as of 8/31/21)	$3,040,654
Unreserved Capital Projects Funds	$0
Total Secured	$3,040,654

Table 9B: Unsecured Finance Plan

Type	**Amount**
Impact Fees (1)	$1,059,346
Capital Projects Funds (bonds and state match)	$500,000
Total Unsecured	$1,559,346

(1) From projects in the pipeline.

B. Financing Sources

The cost for all the planned improvements will be paid for with school impact fees that have been collected for these facilities contained in the District's prior plan, and other available public funds.

The Growth Management Act (GMA) authorizes local jurisdictions to collect impact fees to supplement funding of additional public facilities needed to accommodate new development. Local jurisdictions in Clark County have adopted impact fee programs that require school districts to prepare and adopt Capital Facilities Plan. Impact fees reflected within this Capital Facilities Plan do not include expenditures for new permanent facilities needed for growth (facilities needed for growth from the prior plan are carried forward). Therefore, the District will not be collecting additional impact fees once this plan is adopted until the plan is updated and additional facilities are identified to serve growth.

Staff Report

October 3rd, 2022 Council Workshop Meeting

Annual Review Request to Modify Comprehensive Plan and Zoning
Presenter: Robert Maul, Interim Community Development Director
Time Estimate: 10 minutes

Phone	Email
360.817.7255	rmaul@cityofcamas.us

BACKGROUND: The Camas Municipal Code (CMC) allows for annual review requests to modify a comprehensive plan designation for properties outside of the periodic Comp Plan review required by state law. Specifically, CMC 18.51.020 states "The comprehensive Plan shall be reviewed once a year as a Type IV legislative process, and in accordance with RCW35A.63.070-073.

SUMMARY: The applicant is seeking to change the comprehensive plan designation for a five acre parcel, #986026906, address 4711 NW CAMAS MEADOWS DR, CAMAS, WA from Light Industrial/Business Park, to Commercial so the zoning can be changed to Mixed Use. The easterly abutting properties have all had the same change over the last two years. Please see Exhibit 1 for a detailed staff report, analysis and summary.

EQUITY CONSIDERATIONS:

What are the desired results and outcomes for this agenda item? This is a workshop item for Council to provide background information on a comprehensive plan change request.

What's the data? What does the data tell us? The applicant has provided a written narrative, supportive economic study, traffic analysis as well as cited comprehensive plan goals and support from the City Engineer on utility impacts.

How have communities been engaged? This is an individual request by a property owner. The public hearing notice will include abutting properties within a 300' radius, public noticing on all city social media outlets and on the city website.

Who will benefit from, or be burdened by this agenda item? The applicant is seeking flexibility in development options. Future site development will serve the general community with housing and commercial development options.

What are the strategies to mitigate any unintended consequences? N/A

Does this agenda item have a differential impact on underserved populations, people living with disabilities, and/or communities of color? Please provide available data to illustrate this impact. All future development will be required to comply with all local, state and federal regulations, and laws on equity.

Will this agenda item improve ADA accessibilities for people with disabilities? All future development will be required to comply with all current ADA accessibility regulations.

What potential hurdles exists in implementing this proposal? There some site constraints that will have to be addressed regardless of the zoning designation for steep slopes, critical areas and other site impacts.

How will you ensure accountabilities, communicate, and evaluate results? The development review process requires compliance with all adopted regulations.

How does this item support a comprehensive plan goal, policy or other adopted resolution? Yes, as shown these changes can and will comply with adopted comprehensive plan policies.

BUDGET IMPACT: N/A

RECOMMENDATION: This is for presentation only.

Item 2.

2022 Comprehensive Plan Amendments

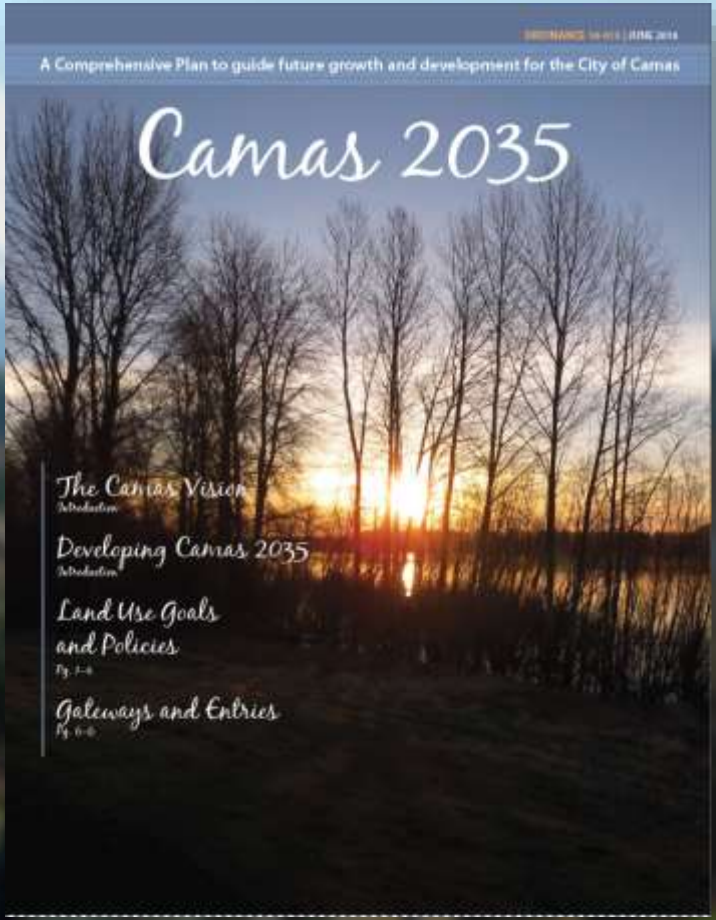
City Council Workshop

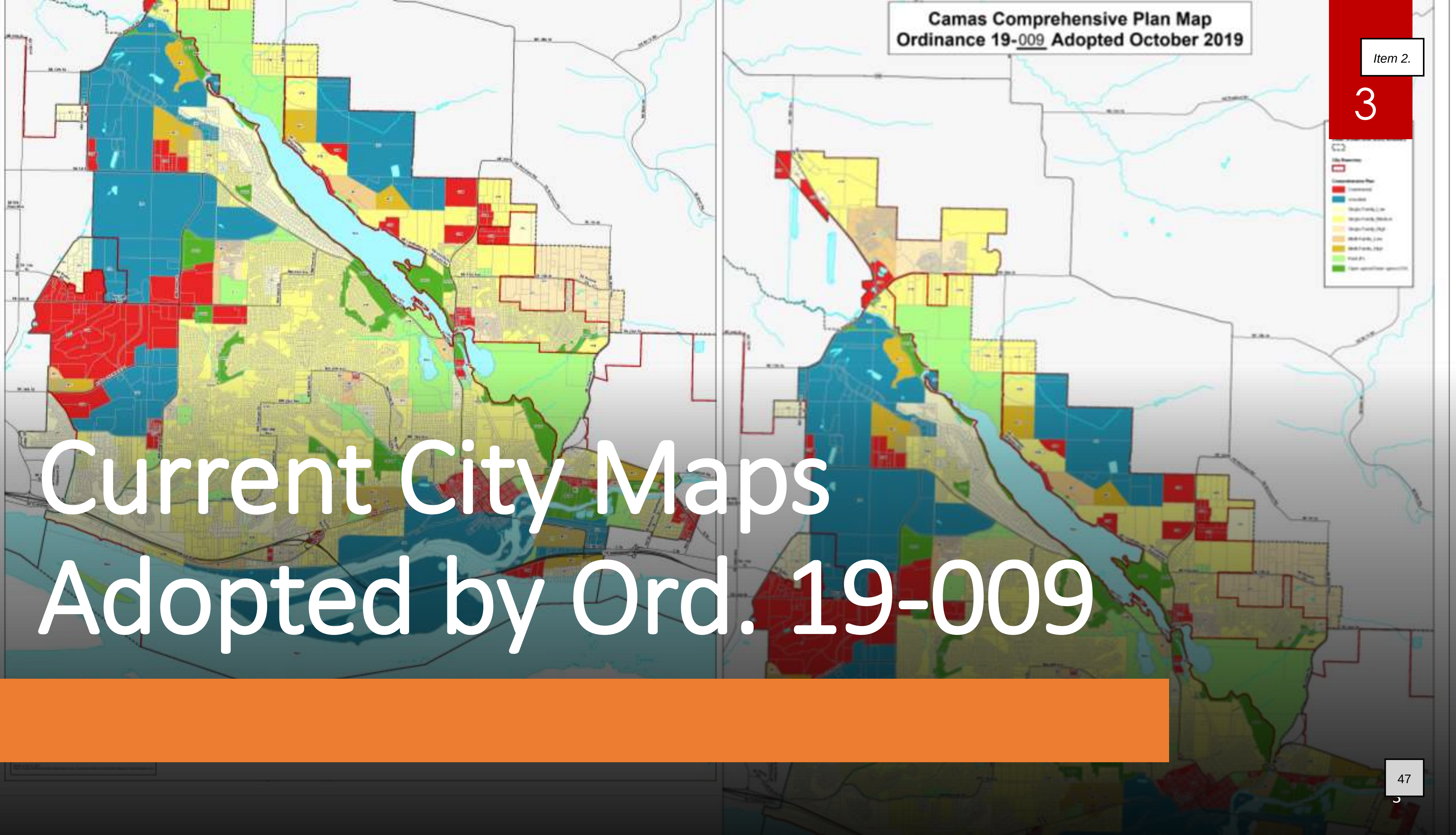
October 2022

1

Elements of Camas 2035

Land Use	1
Housing	2
Natural Environment	3
Transportation	4
Public Facilities & Services	4
Economic Development	6
Appendices	



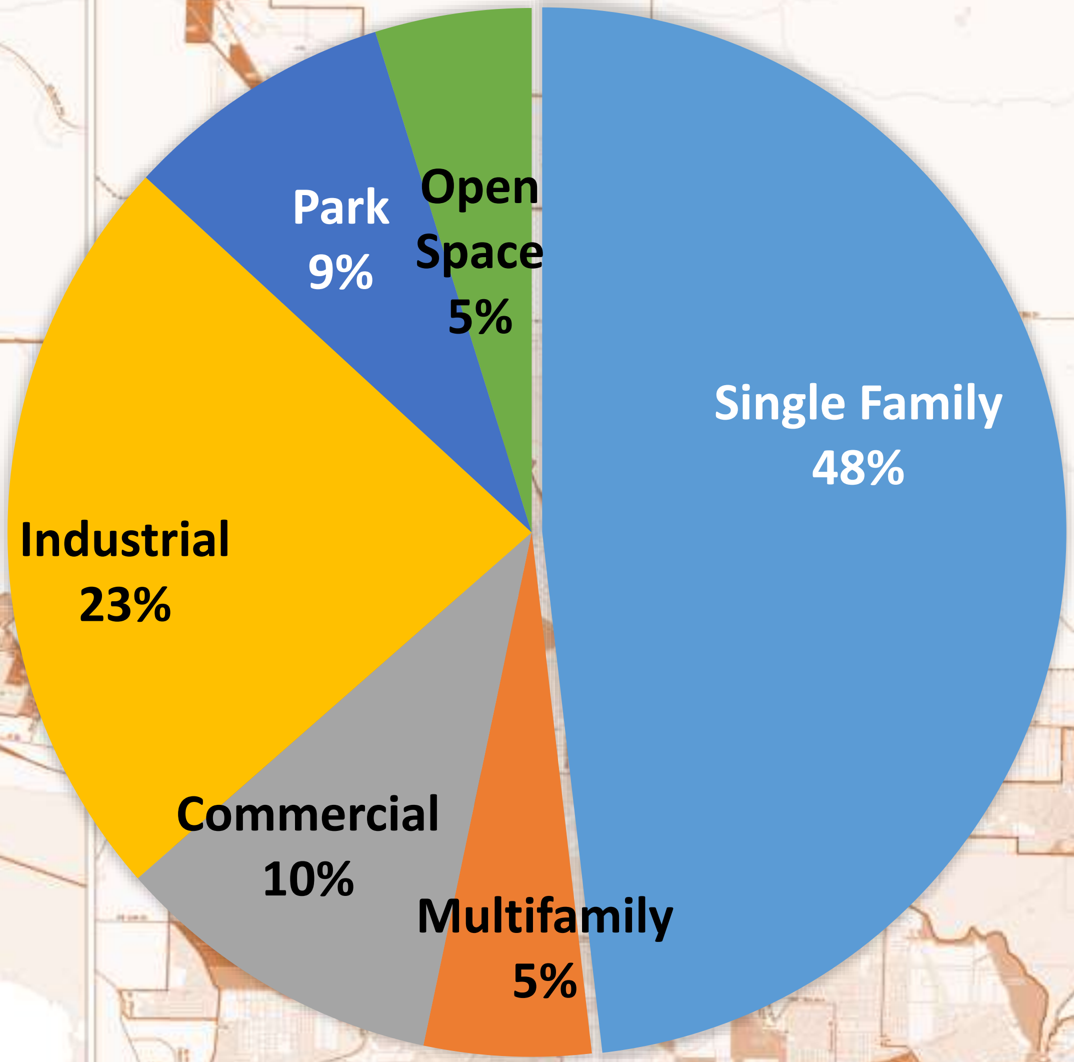


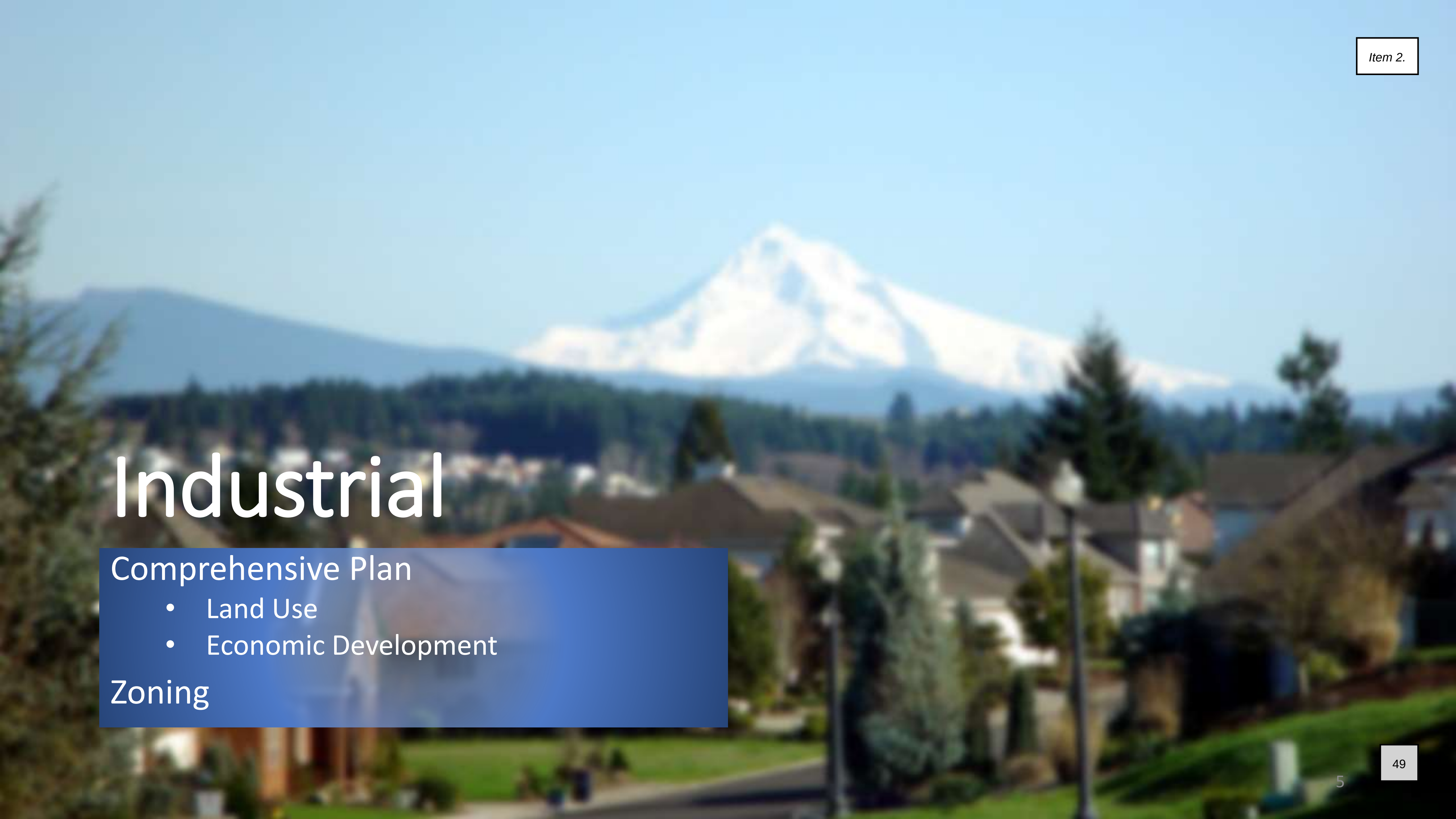
Current City Maps Adopted by Ord. 19-009

Camas Comprehensive Plan Map
Ordinance 19-009 Adopted October 2019

Total City Acreage

Comprehensive Plan Designations	Current Acres
Single Family	
· Low Density	866.86
· Medium Density	3,608.65
· High Density	437.49
Multi-Family	
· Low Density	290.01
· High Density	256.71
Commercial	970.56
Industrial	2,427.0
Park	850.72
Open Space / Green Space	492
Total acreage:	10,200





Industrial

Comprehensive Plan

- Land Use
- Economic Development

Zoning

Light Industrial/Business Park Zone “Grass Valley”

Camas Meadows Dr.

Plexsys

Lightfeet

Reality

Oregon Ice Cream

Logitech

NW Lake Road

Safe Fire

Almar Tools

Wafer Tech

Samson Sports

NW Pacific Rim Dr.

Kärcher

Furuno

(West-Adjacent) Holland Shopping Center

7

Mixed Use Zone

2nd Avenue

South of Safeway

Chiropractic clinics

Opus Music

School Distict (Life skills home)

Everett Street

Acorn & the Oak

Muranos Deli

L&L Auto

Kajak Rentals

Evaluation Criteria

Impact upon

- Comprehensive Plan or zoning code?
- Surrounding properties?
- Code & other adopted documents?

Alternatives to the proposal?

Pedwar #CPA22-01

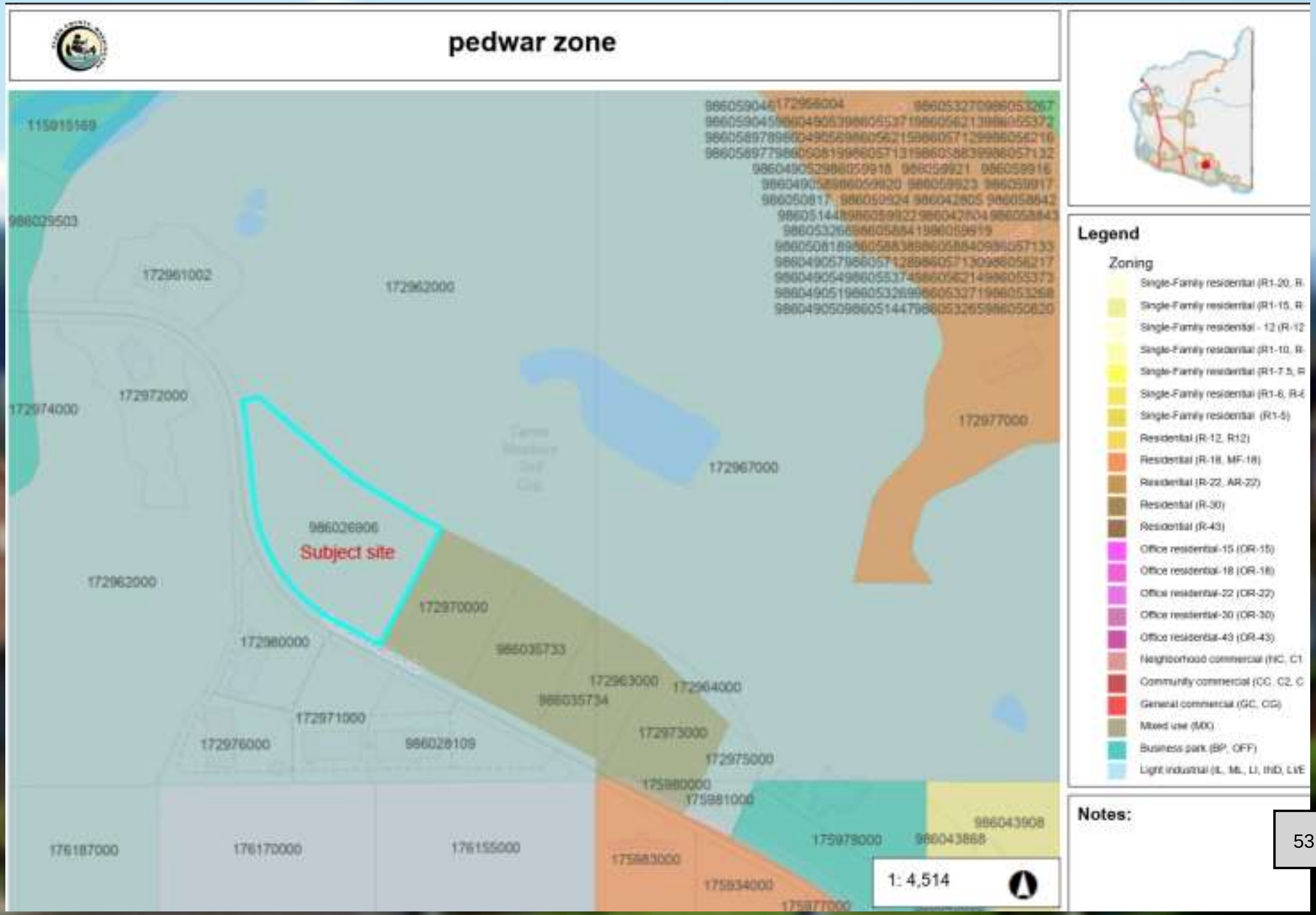
Size: 5 acres

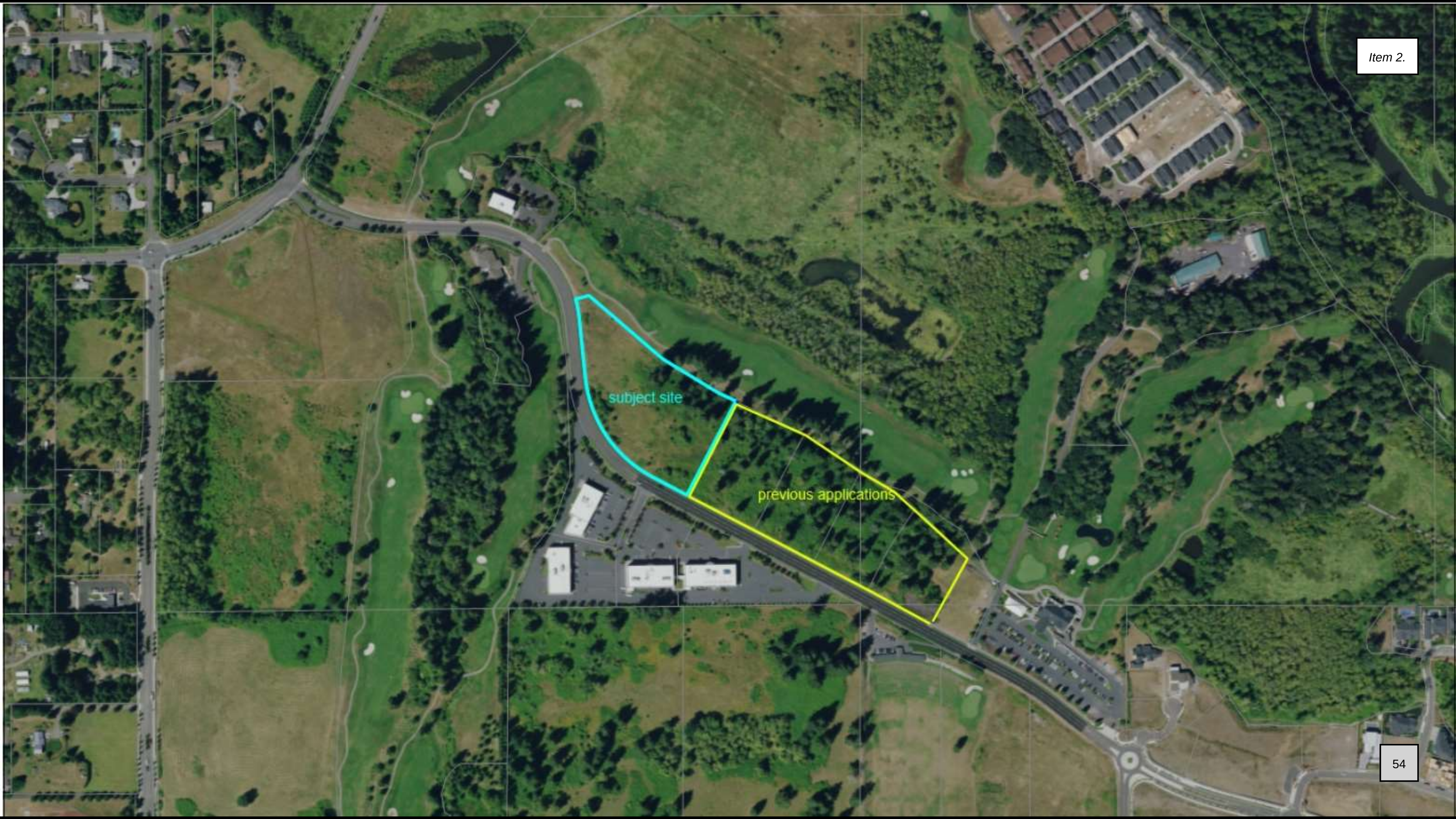
Current: LI/BP - Industrial

Proposed: MX - Commercial

Current Use: Vacant

Adjacent Use: Golf Course




subject site
previous applications

Next Steps

- ✓Public Hearing – Planning Commission October 19th
- ✓Public Hearing – City Council November 7th
- ✓Staff report will include the department's recommendation as follows:
  - Adoption,
  - Rejection or
  - Deferral of each proposed change

STAFF REPORT

Annual Comprehensive Plan Amendments
City File Number: CPA22-01

TO:	Camas City Council	**DATE:**	October 3rd, 2022
FROM:	Marty Snell, AICP, MacKay Sposito on behalf of planning staff		
LOCATION:	4711 NW Camas Drive (Property Tax ID# 986026906)		
APPLICABLE LAW:	Camas Municipal Code Chapters (CMC) Chapter 18.51		

CONTENTS:

This Staff Report will:

- Analyze the City's Comprehensive Plan policies and goals; and
- Address the provisions set forth in Camas Municipal Code 18.51.

I. COMPREHENSIVE PLAN AMENDMENT PROCESS

Each year in the months leading up to January, the City announces that proposed amendments to the Comprehensive Plan will be received for 30 days. The City received one application (File: CPA22-01).

II. BACKGROUND

In 2016, the city adopted a complete update to its comprehensive plan and map, titled Camas 2035 (Ord. 16-010). The city's comprehensive plan guides land use and the city's financial plans relative to capital facilities and the provision of city services and programs, consistent with the state's Growth Management Act (GMA) and Clark County's Community Framework Plan.

The plan includes six (6) elements that work together to achieve the community's vision and long-term economic vitality. Those elements include policies and goals for the following: Land Use; Housing; Natural Environment; Transportation and Street Plans; Public Facilities, Utilities, and Services; and Economic Development.

The growth plan anticipates that the city will have a total population of 34,098 in 2035 and will add 11,182 new jobs. According to the state's Office of Financial Management, the city's population, as of April 1, 2021, is **26,870**, which is a 3.09% increase from the 2020 Census of **26,065**. This increase is 1.15% more than the Clark County increase of 1.94%, which is in keeping with a trend of more growth than the county experiences as a whole.

The City must evaluate proposed comprehensive plan changes in order to provide a balance of residential and employment lands. The City must also carefully evaluate the amount of developable land for each use, after deducting for critical areas or other practical challenges. The following report will discuss the city's compliance with the population and employment allocations to date and provide an analysis of the proposed amendments.

III. LAND INVENTORY

EMPLOYMENT LANDS

The city's vision for economic development (Camas 2035, Section 6.1) in part reads, "In 2035, the economy has grown to attract a variety of businesses that offer stable employment opportunities and family wage jobs in the medical and high tech fields." This element also has a goal to 'maintain a diverse range of employment opportunities to support a setting and quality of life that attract and retain businesses.'

The City has approximately 3,398 acres designated for employment (combined commercial and industrial lands), or 33% of the overall acreage. Based on June, 2022 Clark County's Buildable Lands Report (BLR), it is estimated that there is 963 net acres of vacant and underutilized employment land in Camas. The model estimates that the city's capacity of 296 net acres of Commercial land and 667 acres of Industrial land will create 11,921 additional jobs by 2035. This estimate is based on the employment density assumptions of adding 9 jobs per acre for industrial and 20 jobs per acre for commercial, which was reaffirmed by Clark County for the June 2022 BLR.

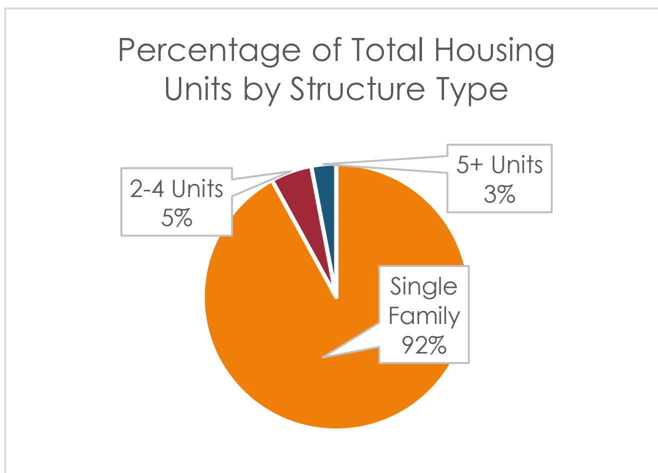
Given the high-level nature of the buildable lands analysis, there may be additional land that cannot be developed when detailed site plans are researched, or alternatively, a new employer may exceed the estimated jobs per acre based on whether their industry can expand vertically instead of lineally.

The Industrial comprehensive plan designation is comprised of the following zones: Light Industrial (LI); Light Industrial Business Park (LI/BP); Business Park (BP); and Heavy Industrial (HI). The city's industrial lands include the top employers, some school district properties, and provide family-wage jobs. Commercially designated properties include the following zones: Regional Commercial (RC); Downtown Commercial (DC); Mixed Use (MX); Neighborhood Commercial (NC); and Community Commercial (CC). The most recent commercial developments and preliminary approvals have occurred in the city's downtown and along NW 38th Avenue.

RESIDENTIAL LANDS

The majority of land in Camas is designated for single family residential uses (45%). Together with multifamily, residentially designated lands comprise approximately 53% of total acreage. Camas 2035 states that the city must add 3,868 new residential units within residentially designated areas by 2035 to meet the growth rate of 1.26 percent population growth per year. Since adoption in 2016, there has been an average of 250 residential units built per year.

In July, the city adopted the Camas Housing Action Plan (Res. 21-006), which provides detailed background information on the city's current housing stock, and strategies to further the 2035 goals of achieving a greater mix of housing types, sizes, and affordability levels. The following chart is an excerpt from the plan. The full plan is available on the city's website at: https://www.cityofcamas.us/com-dev/page/camas-housing-action-plan.



Multifamily Apartment and Townhouse Developments in Camas, 2022

Development Name	Type	Year Built	NUMBER OF UNITS
Lloyd Apartments, 1022-1050 E. 1st Avenue	Apartments	1954	8
Hill Crest Apartments, 1222 NW Couch Street	Apartments	1971	5
First Avenue Apartments, 1410 E. 1st Avenue	Apartments	1972	11
Camas House Apartments, 1102-1138 E. 1st Avenue	Apartments	1979	16
Crown Villa, 1529 Division Street	Apartments	1986	19
River View Apartments, 3003 NE 3rd Avenue	Apartments	1995	60
Russell Street Townhouses, 1820 SE Seventh Ave	Townhomes	1996	9
River Place Apartments, 1718 SE 11th Avenue	Apartments	1998	20
Third Avenue Apartments, 2615 NE 3rd Avenue	Apartments	2000	42
Camas Ridge, 1420 NW 28th Avenue	Apartments	2011	51
Logan Place Village, 1346 NW 25th Avenue	Townhomes	2014	26
7th Avenue Townhomes, 710 NW 7th Avenue	Townhomes	2015	10
Stoneleaf Townhomes, 5843 NW 26th Avenue	Townhomes	2015	12
Parker Village, 20th Avenue & NW Brady Road	Townhomes	2018	60
Terrace at River Oaks, 3009 NE 3rd Avenue	Apartments	2018	120
Clara Apartments, 608 NE Birch Street	Apartments	2020	32
Kielo at Grass Valley, 5988 NW 38th Avenue	Apartments	2020	276
Parklands at Camas Meadows, NW Longbow Lane	Townhomes	2020	24
The Casey, 5515 NW Pacific Rim Blvd.	Apartments	2022 (u.c.)	136

IV. APPLICABLE COMPREHENSIVE PLAN GOALS & POLICIES

In order to support changes to the Camas 2035 plan, the city must review the application in light of Camas Municipal Code (CMC) 18.51 Comprehensive Plan and Zoning Amendments and, more specifically, CMC 18.51.030 Evaluation Criteria to address the following:

A. *Impact upon the city of Camas comprehensive plan and zoning code;*
B. *Impact upon the surrounding properties, if applicable;*
C. *Alternatives to the proposed amendment; and*
D. *Relevant code citations and other adopted documents that may be affected by the proposed change.*

Further, the city must agree that the proposed amendments comply with and promote the goals of the Growth Management Act.

Commercial and industrial properties are focal points as to where the city plans and anticipates job growth potential for the community. The Camas 2035 plan includes goals and policies for job growth within the Economic Development element of the plan (Ch. 6). The subject property is located within the "Grass Valley" area of the city, which is within an economic development target area located in the west side of the city.

The applicant proposes to amend the Industrial designation to Commercial, with an associated zoning district of Mixed Use (MX). Relevant goals and policies are found in the Land Use, Housing, and Economic Development chapters of the Camas 2035 plan. A few are touched on below.

Land Use (Camas 2035, Ch. 1): The city's overall vision is outlined in the Land Use chapter. Five (5) major land use categories are covered in this chapter with goals and policies.

Citywide Goal LU-1: Maintain a land use pattern that respects the natural environment and existing uses while accommodating a mix of housing and employment opportunities to meet the City's growth projections.

The following policies are particularly applicable to the proposed amendments:

> Policy LU-1.1: Ensure the appropriate mix of commercial-, residential-, and industrial-zoned land to accommodate the City's share of the regional population and employment projections for the 20-year planning horizon.
>
> Policy LU-1.3: Maintain compatible use and design with the surrounding built and natural environments when considering new development or redevelopment.
>
> Policy LU-1.5: Where compatible with surrounding uses, encourage redevelopment or infill development to support the efficient use of urban land.

<u>Goal LU-2</u>: Create a diversified economy and serve Camas residents and tourists by providing sufficient land throughout the City to support a variety of business types and employment opportunities.

The following policies are particularly applicable to the proposed amendments:

> Policy LU-2.4: Encourage mixed-use developments (residential and commercial) in order to support adjacent uses and reduce car trips, but not at the expense of job creation.
>
> Policy LU-2.7: Protect employment land from conversion to residential uses in order to ensure an adequate supply of commercial and industrial land to meet 20-year employment projections.

Housing (Camas 2035, Ch. 2): The city's housing goals and policies focus on increasing housing diversity and affordability over the next 20 years.

<u>Citywide Goal (H-1):</u> Maintain the strength, vitality, and stability of all neighborhoods and promote the development of a variety of housing choices that meet the needs of all members of the community.

The following policies are particularly applicable to the proposed amendments:

> Policy H-2.3: Any comprehensive plan designation change that increases residential capacity should require a quarter (25 percent) of the new units to be affordable to households earning 50 to 80 percent of Camas' MHI at the time of development.
>
> Policy H-2.4: All affordable housing created in the City should remain affordable for the longest possible term, whether created with public funds, through development agreements, or by regulation.

Economic Development (Camas 2035, Ch. 6): The vision for the community's economy is articulated in this chapter. The city is broken out by six (6) distinct areas. The most relevant of these is the Grass Valley area.

<u>Grass Valley Economic Development Goal, ED 3:</u> Promote a cooperative industrial business park in which businesses and the City share resources efficiently to achieve sustainable development, with the intention of increasing economic gains and improving environmental quality.

The following policy is applicable to the proposed amendments:

> Policy ED-3.3: Protect employment land from conversion to residential uses by requiring an analysis of adequate buildable lands in Grass Valley to meet 20-year employment projections prior to land conversion approval.

Impacts on Utilities and Transportation Plans
Public Works staff reviewed the proposed zone change of this five (5) acre parcel and considered the potential substantive impacts to the city's sewer, water, and transportation systems and plans. With negligible impacts to either systems or plans, Public Works concluded that the proposed change does not warrant revisions to the adopted plans. Future potential impacts will be reviewed and considered again at the time of a development application. (*see Public Works memo dated September 7, 2022*)

EVALUATION CRITERIA – CMC 18.51.030 (A-D)

The application materials must include responses to eight general questions (A-H, of CMC§18.51.010).

After considering whether or not the current plan is deficient, the Planning Commission must recommend whether to support, reject or defer the amendments to City Council. The code provides the following criteria at CMC18.51.030:

A. *Impact upon the city of Camas comprehensive plan and zoning code;*
B. *Impact upon surrounding properties, if applicable;*
C. *Alternatives to the proposed amendment; and*
D. *Relevant code citations and other adopted documents that may be affected by the proposed change.*

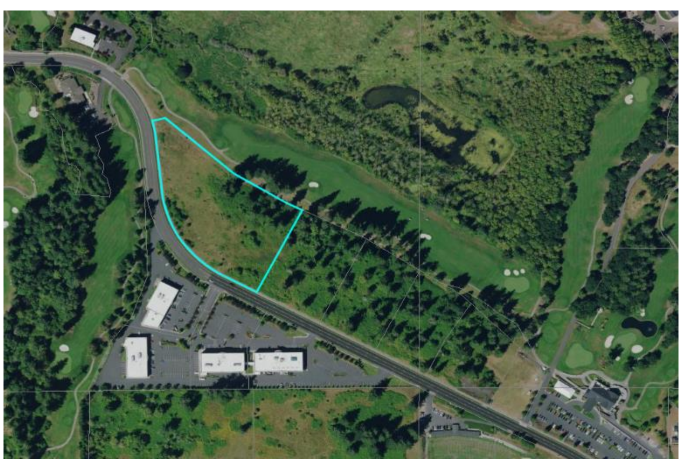
At the following section, staff will address the applicable criteria for each proposal. At Section IX of this report, there is a summary of the proposed changes to land use acreages.

V. PROPOSED AMENDMENT

A. PEDWAR PROPERTY (FILE #CPA22-01)

Description: Amend comprehensive plan from to Industrial to Commercial with an associated rezone from Light Industrial/Business Park (LI/BP) to Mixed Use (MX) of a 5-acre site that is currently vacant.

Site Location and Description:



The vacant 5-acre (+/-) property is located along NE Camas Meadows Drive and is designated Industrial with zoning of Light Industrial/Business Park (LI/BP). The same designation lies to the north, west and south of the site. To the north is the Camas Meadows Golf Course and across the street; to the south is a corporate business park. To the east of the site, properties comprising 8.8 (+/-) acres were amended in 2020 and 2021 from Industrial to Commercial with a concurrent rezone of Mixed Use. Further to the southeast are multifamily designated properties, with one project, the Village at Camas Meadows under construction. Another multifamily development is located north of the golf course. To the east of the golf course, there is a Business Park zone with a mixed use development planned.

Discussion: The applicant requests that the comprehensive plan designation of Industrial on the subject parcels be amended to Commercial, with a concurrent rezone from LI/BP to MX.

In order to better evaluate the proposal, the city must consider the comprehensive plan goals and policies for the Grass Valley Area (Economic Development, Chapter 6) and the zoning regulations of the proposed Mixed Use Zone. The comprehensive plan specifically requires an analysis of buildable lands, for any proposed conversions within the Grass Valley area of the city, "**ED-3.3:** *Protect employment land from conversion to residential uses by requiring an analysis of adequate buildable lands in Grass Valley to meet 20-year employment projections prior to land conversion approval*."

Land Need Analysis for Mixed Use Development

For this request, the applicant submitted a report titled "Land Need Analysis for Mixed Use Development on a Site in Camas, Washington" (Johnson Economics, LLC, February, 2022). The stated purpose of this report is to evaluate the feasibility of multi-family residential development on the subject site. Furthermore, analysis in the report compares the suitability of the site for two alternative uses (business park v. mixed use) based on market and planning criteria.

Land Capacity vs. Demand (Camas 2035)

The report notes there are thousands of square feet of space available at the Camas Meadows Corporate Center and an estimated oversupply of industrial and business park land to accommodate new development. (pp. 4 & 5) Additionally, the report outlines the findings of Clark County's Vacant Buildable Lands Model and the city's own Comprehensive Plan relative to land capacity. Figure 3.1 of the report (p. 6) shows a net surplus across commercial, industrial, and residential land uses – 127 acres, 167 acres, and 231 acres respectively. Relying on Clark County's Buildable Lands Report for the pace of development for five years (2016-2020), the report states there is sufficient land supply for commercial (over 50 years), industrial (over 400 years), and residential (8 years) uses. While commercial and industrial development tends to be 'chunky' – meaning development does not happen on a linear 6-acre or 1.6-acre burn rate per year as noted on page 6 of the report – it stands to reason that there is more land supply for commercial and industrial development than there is for residential development. This point is underscored in the northern area of Grass Valley, where the report notes an adequate supply of space and land for commercial/industrial use and a constrained supply for residential use.

Supplemental Employment Sector Analysis

Johnson undertook some analysis of forecasted growth dates for major industry sectors, based on WA Employment Security Department data for the broader SW WA region. The analysis leads to the expectation of more growth in the Education and Health services and also in Professional and Business Services – both in terms of percentages and in absolute jobs numbers. The conclusion of this analysis is '***the greatest number of new jobs will be found in sectors that tend to use commercial office and retail space (and land) and fewer jobs in sectors that use industrial space***.' (p. 7)

Residential Demand Analysis

The Johnson Economics report includes a somewhat in-depth analysis of the market for rental housing (apartments) in Camas for the past 20 years and for the next 5 years (2022-2027). The analysis shows a trend of households growing older and with more households with higher incomes than in the previous two decades. The report forecasts that new growth alone will demand support for 250+ units over the next five years and will represent a wide array of household incomes and cohort groups. One interesting note in the report speaks to 'trading up' into newer units with less wear-and-tear and more amenity rich complexes. This is in response to research that many of the existing apartment projects in Camas are old and are small (averaging 35 years old and 19 units as an average size). The report concludes that more updated properties and development should offer competitive advantages to households looking to rent.

Report Conclusions

The report concludes with, "While the subject site is generally suitable for either of the proposed uses, the prospective industrial business park development faces some disadvantages while a mixed-use development generally enjoys advantages for feasibility." The conclusion is based on market forces, demand for multifamily residential units, topography of the site, and compatibility with adjacent and surrounding uses. (p. 13)

Mixed Use Zoning in Camas

Previous to 2020, the Mixed Use Zone was found at two areas of the city—adjacent to downtown and north of the intersection of Lake Road and Everett Road. Those areas were targeted for their redevelopment potential for transit-oriented developments, given the prevalence of small lots located near arterials and collectors. Those areas were also formerly designated a mix of other commercial designations that at the time prohibited new residential construction. Mixed Use and Downtown Commercial zones are the only commercial zones in the city that allow a variety of residential uses outright. Camas 2035 ("Plan") at Section 1.4.5 states, "*Future conversion of commercial or industrial areas to MX should consider the benefits to the community, such as providing a gathering place (e.g., pocket park), housing options for a variety of income levels, and job opportunities*." This section of the Plan includes three policies and the following goal for mixed use areas. "**LU-5:** *To foster economically and socially diverse mixed neighborhoods as the foundation for a healthy city, which includes meeting the multi-modal transportation, housing, employment, education, recreation, and health needs of the citizens*."

The LI/BP Zone is almost entirely found on parcels in the northwestern section of the city. Over the past few comprehensive plan amendment cycles, properties have converted from LI/BP to either BP or RC zones due to the restrictive development standards of the LI/BP zone, which include deep building setbacks from property lines (Refer to Section XI of this report). The current zoning requires a minimum front setback of 200-feet and rear setback of 100-feet. In comparison, in the MX zone there is a *maximum* front building setback of 10-feet, meaning that a building must be established at the front property line or no further back than 10-feet.

Amendment of a comprehensive plan designation not only includes a consideration of the comprehensive plan, development standards of the zoning, but also includes a comparison of the allowed land uses within the current zone and proposed zone in order to evaluate the merits of the proposal and any unintended consequences of such change. The allowed land uses for each zone are found within the Use Authorization Table at CMC Chapter 18.07. There are 73 outright allowed uses within the MX zone and of those, there are 41 uses that are not allowed ("X") within the current zoning of the property (see list at Section XI of this report).

A variety of residential uses are generally allowed in the MX zone, where they are prohibited in the LI/BP zone. The city has a level of concern that development of this site and adjacent MX properties could be entirely residential in nature, given that the MX does not mandate a mix of uses. However, there is a limit to the amount of residential development that could be built, as the MX zone includes a maximum residential density of 24 units per acre. The site would be limited to 120 units.

EVALUATION CRITERIA **CMC18.51.030 (A-D) and CMC18.51.010 (C)**	**FINDINGS**
Impact upon the city of Camas comprehensive plan and zoning code;	The amendment would decrease industrial lands by five (5) acres and increase land for residential or mixed use development.
Impact upon surrounding properties, if applicable;	The city did not identify any detrimental effects to adjacent properties if this change is approved.
Alternatives to the proposed amendment; and	The applicant submitted a Land Use Analysis for Mixed Use Development report that compared potential development under current zoning and potential development under Mixed Use zoning. (Johnson Economics, LLC, February 2022) The report finds and supports the conversion of a modest amount of industrial land to commercial land, without significantly impairing the ability to meet future industrial demand. (p. 15 of the report)
Relevant code citations and other adopted documents that may be affected by the proposed change.	Public Works staff has provided a memo stating that it has considered the zone change of this five (5) acres, in light of the water, sewer, and transportation plans and find the potential impact negligible.
Why the current comprehensive plan is deficient or should not continue in effect. Specifically: "Protect employment land from conversion to residential uses by requiring an analysis of adequate buildable lands in Grass Valley to meet 20-year employment projections prior to land conversion approval." – Policy ED-3.3	The Johnson Economics, LLC report relies on Clark County's Buildable Lands Report and Vacant Buildable Lands Model (VBLM) to support its findings that Camas has an adequate supply of commercial and industrial land to accommodate future growth. The report further provides reasons why Mixed Use and, specifically residential development, is more suitable for this property, which go to topography, compatibility, market conditions, and a strong demand for multifamily development.

Pursuant to CMC18.51.030 a staff report "*shall contain the department's recommendation on adoption, rejection or deferral of each proposed change*".

VI. PUBLIC COMMENT

None at this time.

VII. STAFF RECOMMENDATION

Department Recommendation: N/A at this time. This is an informative presentation only. Staff will conduct a public hearing with the Planning Commission on October 19th, 2022 which will provide a recommendation to the Camas City Council on November 7th, 2022.

VIII. TABLE 1 –2021 COMPREHENSIVE PLAN ACREAGE (PROPOSED)

Comprehensive Plan Designations	Current Acres	CPA22-01	Final Acres
Single Family			
· Low Density	866.86		866.86
· Medium Density	3608.65		3608.65
· High Density	437.49		437.49
Multi-Family			
· Low Density	311.01		311.01
· High Density	256.21		256.21
Commercial	979.36	5	979.36
Industrial	2397.2	-5	2292.20
Park	850.72		850.7
Open Space / Green Space	492.00		492.0
Total acreage:	10,200		10,200

Zoning**	2020	CPA22-01	Final 2021 Acreage
Parks/Open Space			
Neighborhood Park (NP)	145.14		145.14
Special Use (SU)	164.09		164.09
Open Space (OS)	421.55		421.55
Industrial			
Heavy Industrial (HI)	858.58		858.58
Light Industrial (LI)	91.83		91.83
Business Park (BP)	542.63		542.63
Light Industrial/Business Park (LI/BP)	790.75	**-5**	785.75
Residential			
Residential-15,000 (R-15)	716.30		716.30
Residential-12 (R-12)	925.43		925.43
Residential-10,000 (R-10)	989.29		989.29
Residential-7,500 (R-7.5)	1534.34		1534.34
Residential-6,000 (R-6)	191.11		191.11
Multifamily Residential-10 (MF-10)	224.39		224.39
Multifamily Residential-18 (MF-18)	312.70		312.70
Commercial			
Downtown Commercial (DC)	72.22		72.22
Mixed Use (MX)	46.56	**5**	51.56
Regional Commercial (RC)	597.93		597.93
Neighborhood Commercial (NC)	10.57		10.57
Community Commercial (CC)	237.44		237.44
Total Acres	**8872.95**		**8872.95**

***Does not include UGB areas*

IX. ZONING REGULATIONS

USE AUTHORIZATION TABLE – CMC CHAPTER 18.07

Comparison of land uses that are allowed ("P") in the MX Zone and uses that are prohibited ("X") in the LI/BP Zone. Residential-type uses are highlighted.

Zoning Districts	MX	LI/BP
Antique shop [6]	P	X
Appliance sales and service [6]	P	X
Bowling alley/billiards [6]	P	X
Building, hardware and garden supply store [6]	P	X
Clothing store [6]	P	X
Department store [6]	P	X
Furniture repair; upholstery [6]	P	X
Furniture store [6]	P	X
Funeral home [6]	P	X
Grocery, large scale [6]	P	X
Grocery, small scale [6]	P	X
Hospital, emergency care [6]	P	X
Hotel, motel [6]	P	X
Household appliance repair [6]	P	X
Laundry (self-serve)	P	X
Nursing, rest, convalescent, retirement home [6]	P	X
Pet shops [6]	P	X
Second-hand/consignment store [6]	P	X
Shoe repair and sales [6]	P	X
Theater, except drive-in [6]	P	X
Veterinary clinic [6]	P	X
Auditorium [6]	P	X

Zoning Districts	MX	LI/BP
Community club [6]	P	X
Church [6]	P	X
Library [6]	P	X
Museum [6]	P	X
Sports fields [6]	P	X
College/university [6]	P	X
Elementary school [6]	P	X
Junior or senior high school [6]	P	X
Private, public or parochial school [6]	P	X
Adult family home	P	X
Apartment, multifamily development, row houses	C	X
Assisted living	P	X
Bed and breakfast	P	X
Designated manufactured home	P	X
Duplex or two-family dwelling	P	X
Group home	P	X
Home occupation	P	X
Housing for the disabled	P	X
Residence accessory to and connected with a business	P	X
Single-family dwelling	P	X

X. DEVELOPMENT STANDARDS – CMC CHAPTER 18.09

Comparison of development dimension standards that apply to the MX Zone and the LI/BP Zone.

	MX	**LI/BP** Note 2
Maximum Density (dwelling units/net acre)	24	n/a
Minimum lot area (square feet)	1,800	10 acres
Minimum lot width (feet)	None	Not specified
Minimum lot depth (feet)	None	Not specified

Setbacks: Commercial and industrial development setbacks shall be as follows, unless along a flanking street of a corner lot. If along flanking street, then the setback must be treated like a front, and provide safe sight distance.

Minimum front yard (feet)	Note 3	5' per 1 foot of building height (200' minimum)
Minimum side yard (feet)	10'	100' for building; 25' for parking
Minimum rear yard (feet)	25'	100' for building; 25' for parking area
Lot Coverage: Lot coverage (percentage)	1 story (60%) 2 stories or more (50%)	1 story (30%) 2 stories (40%) 3 stories (45%)
Building Height Maximum building height (feet)	None	60

Notes:
1. If along a flanking street of corner lot.
2. The densities and dimensions in the LI/BP zone may be reduced under a planned industrial development. See Chapter 18.21 Light Industrial/Business Park.
3. Maximum setback at front building line is ten feet.
4. Residential dwelling units shall satisfy the front setbacks of CMC Section 18.09.040 Table 2, based on comparable lot size.

City of Camas WASHINGTON

Community Development Department | Planning
616 NE Fourth Avenue | Camas, WA 98607
(360) 817-1568
communitydevelopment@cityofcamas.us

General Application Form

Case Number: CPA22-01

Applicant Information

Applicant/Contact:: Romano Development, Inc. (Kess Romano) Phone: (360) 952-3811

Address: 4610 NE 77th Avenue, Suite 102 (Street Address) kess@romanofinancial.com (E-mail Address)

Vancouver (City) WA (State) 98662 (ZIP Code)

Property Information

Property Address: 4711 NW Camas Meadows Drive (Street Address) 986026-906 (County Assessor # / Parcel #)

Camas (City) WA (State) 98607 (ZIP Code)

Zoning District: Light Industrial/Business Park Site Size ± 5.0 Acres

Description of Project

Brief description:
Proposal to amend the comprehensive plan designation from Industrial to Commercial, and to rezone the parcel from Light Industrial/Business Park (LI/BP) to Mixed Use (MX)

Are you requesting a consolidated review per CMC 18.55.020(B)? ☐ YES ☒ NO

Permits Requested: ☐ Type I ☐ Type II ☐ Type III ☒ Type IV, BOA, Other

Property Owner or Contract Purchaser

Owner's Name: Romano Properties LLC (Last) (First) Phone: (360) 949-6688

4610 NE 77th Avenue (Street Address) Suite 102 (Apartment/Unit #)

E mail Address: korban@romanofinancial.com Vanocuver (City) WA (State) 98662 (Zip)

Signature

I authorize the applicant to make this application. Further, I grant permission for city staff to conduct site inspections of the property.

Signature: DocuSigned by: Korban Romano 38AEE162BDB8490 Date: 1/27/2022

Note: If multiple property owners are party to the application, an additional application form must be signed by each owner. If it is impractical to obtain a property owner signature, then a letter of authorization from the owner is required.

Date Submitted: 1-31-22 Pre-Application Date:

Staff: Related Cases # PA21-59

☐ Electronic Copy Submitted

Receipt #: 00665852
$6,036.00
Validation of Fees

Revised: 01/22/2019

CPA 22-01
PA 21-59 (Rela[ted])

Application Checklist and Fees [updated on January 1, 2022]

◊ Annexation	$863 - 10% petition; $3,669 - 60% petition	001-00-345-890-00		$
◊ Appeal Fee		001-00-345-810-00	$399.00	$
◊ Archaeological Review		001-00-345-810-00	$137.00	$
◊ Binding Site Plan	$1,879 + $24 per unit	001-00-345-810-00		$
◊ Boundary Line Adjustment		001-00-345-810-00	$103.00	$
◊ Comprehensive Plan Amendment		001-00-345-810-00	$5,826.00	$ 5,826.00
◊ Conditional Use Permit				
Residential	$3,417 + $105 per unit	001-00-345-810-00		$
Non-Residential		001-00-345-810-00	$4,328.00	$
◊ Continuance of Public Hearing		001-00-345-810-00	$524.00	$
◊ Critical or Sensitive Areas (fee per type)		001-00-345-810-00	$775.00	$
(wetlands, steep slopes or potentially unstable soils, streams and watercourses, vegetation removal, wildlife habitat)				
◊ Design Review				
Minor		001-00-345-810-00	$433.00	$
Committee		001-00-345-810-00	$2,375.00	$
◊ Development Agreement	$877 first hearing; $530 ea. add'l hearing/continuance	001-00-345-810-00		$
◊ Engineering Department Review - *Fees Collected at Time of Engineering Plan Approval*				
Construction Plan Review & Inspection		*(3% of approved estimated construction costs)*		
Modification to Approved Construction Plan Review		*(Fee shown for information only)*	$420.00	
Single Family Residence (SFR) - Stormwater Plan Review		*(Fee shown for information only)*	$208.00	
Gates/Barrier on Private Street Plan Review		*(Fee shown for information only)*	$1,041.00	
◊ Fire Department Review				
Short Plat or other Development Construction Plan Review & Insp.		115-09-345-830-10	$284.00	$
Subdivision or PRD Construction Plan Review & Inspection		115-09-345-830-10	$354.00	$
Commercial Construction Plan Review & Inspection		115-09-345-830-10	$424.00	$
◊ Home Occupation				
Minor - Notification (No fee)			$0.00	
Major		001-00-321-900-00	$69.00	$
◊ LI/BP Development	$4,328 + $41.00 per 1000 sf of GFA	001-00-345-810-00		$
◊ Minor Modifications to approved development		001-00-345-810-00	$346.00	$
◊ Planned Residential Development	$35 per unit + subdivision fees	001-00-345-810-00		$
◊ Plat, Preliminary				
Short Plat	4 lots or less: $1,936 per lot	001-00-345-810-00		$
Short Plat	5 lots or more: $7,1755 + $250 per lot	001-00-345-810-00		$
Subdivision	$7,175 + $250 per lot	001-00-345-810-00		$
◊ Plat, Final:				
Short Plat		001-00-345-810-00	$200.00	$
Subdivision		001-00-345-810-00	$2,375.00	$
◊ Plat Modification/Alteration		001-00-345-810-00	$1,196.00	$
◊ Pre-Application (Type III or IV Permits)				
No fee for Type I or II				
General		001-00-345-810-00	$354.00	$
Subdivision (Type III or IV)		001-00-345-810-00	$911.00	$
◊ SEPA		001-00-345-890-00	$810.00	$ 810.00
◊ Shoreline Permit		001-00-345-890-00	$1,196.00	$
◊ Sign Permit				
General Sign Permit	(Exempt if building permit is required)	001.00.322.400.00	$41.00	$
Master Sign Permit		001.00.322.400.00	$126.00	$
◊ Site Plan Review				
Residential	$1,151 + $34 per unit	001-00-345-810-00		$
Non-Residential	$2,876 + $68 per 1000 sf of GFA	001-00-345-810-00		$
Mixed Residential/Non Residential	(see below)	001-00-345-810-00		$
	$4,055 + $34 per res unit + $68 per 1000 sf of GFA			
◊ Temporary Use Permit		001-00-321-990-00	$80.00	$
◊ Variance (Minor)		001-00-345-810-00	$695.00	$
◊ Variance (Major)		001-00-345-810-00	$1,295.00	$
◊ Zone Change (single tract)		001-00-345-810-00	$3,345.00	$

Adopted by RES 1023 AUG 2005; Revised by RES 1113 SEPT 2007; Revised by RES 1163 OCT 2009; Revised by RES 1204 NOV 2010; Revised by RES 15-001 JAN 2015; Revised by RES 15-007 MAY 2015; Revised by RES 15-018 DEC 2015; Revised by RES 16-019 NOV 2016; Revised by RES 17-015 NOV 2017; Revised by RES 18-003 APRIL 2018; Revised by RES 18-013 NOV 2018; Revised by RES 19-018 DEC 2019 Revised by RES20-014 DEC 2020

Fees reviewed & approved by Planner: ________ *Initial* *Date*

For office use only

Total Fees Due: $ 6,636.00

Pedwar Comp Plan

Legend

Taxlots

Notes:

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

Pedwar Property Zone Change
Type IV Comprehensive Plan Amendment

Date:	January 2022
Submitted to:	City of Camas Community Development 616 NE 4th Avenue Camas, WA 98607
Applicant:	Romano Development, Inc. 4610 NE 77th Avenue, Suite 102 Vancouver, WA 98682 Kess Romano (360) 952-3811 kess@romanofinancial.com
AKS Job Number:	9030

AKS
ENGINEERING & FORESTRY

Table of Contents

Pedwar Property Zone Change
Type IV Comprehensive Plan Amendment

Submitted to:	City of Camas Community Development 616 NE 4th Avenue Camas, WA 98607
Applicant:	Romano Development, Inc. 4610 NE 77th Avenue, Suite 102 Vancouver, WA 98682 Kess Romano (360) 952-3811 kess@romanofinancial.com
Property Owners:	Pedwar Development Group, LLC 4711 NW Camas Meadows Drive Camas, WA, 98607
Applicant's Consultant:	AKS Engineering & Forestry, LLC 9600 NE 126th Avenue, Suite 2520 Vancouver, WA 98682 Contact(s): Michael Andreotti, RLA Email: andreottim@aks-eng.com Phone: (360) 882-0419
Site Location:	4711 NW Camas Meadows Drive Camas, WA, 98607
Clark County Parcels:	986026-906
Site Size:	±5.00 acres (±217,800) square feet)
Land Use Districts:	Light Industrial/Business Park (LI/BP)

I. Request

Through this application, Romano Development Inc. (Applicant) is requesting to amend the City of Camas' Comprehensive Plan to move the subject site (described below) from its current Industrial designation to Commercial. With the Comprehensive Plan amendment, the applicant requests to rezone the property from Light Industrial/Business Park (LI/BP) to Mixed-Use (MX) zone. In addition to this narrative, the application package includes the materials necessary for the City Council to review and approve this submittal, including a State Environmental Policy Act (SEPA), Traffic Analysis, and Land Needs Analysis/Economic Study.

This written narrative, together with other documentation included in the application materials, establishes that the application complies with all applicable approval criteria. This documentation represents substantial evidence and provides the basis for City Council to approve the application.

II. Site Description

The subject property is a ±5.0-acre parcel comprised of one tax lot (Clark County Property Identification Number: 986026-906) located at 4711 NW Camas Meadows Drive within the Grass Valley Area of Camas. The site is vacant and situated in Camas' Grass Valley area, within the Light Industrial/Business Park zone. The property fronts NW Camas Meadows Drive along its southwestern boundary and is southeast of the intersection between NE Goodwin Road and NW Camas Meadows Drive. Surrounding properties are predominately within the Light Industrial/Business Park zone with the properties to the southeast zoned Mixed Use (MX). The Camas Meadows Golf Course occupies the abutting tax lots to the north and adjacent lot to the west (across NW Camas Meadows Drive); office buildings and off-street parking areas occupy the properties to the southwest (across NW Camas Meadows Drive). The property abutting the subject site to the southeast is vacant and was recently re-zoned to the Mixed-Use (MX) zone (City file: CPA21-01).

The subject site is hilly, sloping from south to north with grades that range between five percent and 20 percent, with the 20 percent slopes located along the north half of the property. The existing vegetation on site consist mostly of field grass with clusters of shrubs and trees in the northeast corner. According to Clark County Geographic Information Systems (GIS) there are no critical areas on site.

III. Applicable Review Criteria

CITY OF CAMAS MUNICIPAL CODE

Title 18 – Zoning

Chapter 18.51 Comprehensive Plan and Zoning Amendments

18.51.010 Application for amendments to comprehensive plan.

Any interested person, including applicants, citizens, planning commission, city council, city staff, and other agencies, may submit an application in the month of January each year for a comprehensive plan amendment. The application shall specify:

A. A detailed statement of what is proposed and why;

Response: The Applicant proposes to change the Comprehensive Plan designation of the subject site from Industrial to Commercial and change the site zoning from LI/BP to MX. The subject property is a ± 5.0-acre parcel bordered by Camas Meadows Golf Course to the north and west and NW Camas Meadows Drive along its southwest property boundary. The abutting property to the southeast is within a Commercial designation and the Mixed-Use zone. Based on the size of the subject property, the use/zoning of surrounding properties, and the existing grades on site, the potential for this property to be engaged in light industrial or business park use is limited. By designating this property as Commercial and re-zoning the parcel to MX, the subject site will be consistent with the contiguous properties to the southeast, which are within a Commercial designation and situated in the MX zone. Redesignating and re-zoning the property will also allow for a development with uses that can be integrated into the challenging slopes on site, consistent with nearby properties, and compatible with surrounding uses. The MX zone also provides for employment uses, which will minimize impact to the city's inventory of employment land and keep it above the amount needed to meet the 20-year employment projections.

B. A statement of the anticipated impacts of the change, including the geographic area affected, and issues presented by the proposed change;

Response: The Comprehensive Plan amendment will help solve development issues associated with the site. As previously stated, the subject property is a ± 5.0-acre parcel. Based on the site's current zoning, size, existing grades, and the use/zoning of the surrounding properties, the property has limited development potential under the current zoning. Designating the site as Commercial and incorporating it into the MX zone will expand the economic development opportunities for the site, while also providing the opportunity for residential development. The modification will ensure the site is consistent with abutting properties to the southeast and allow for uses that can be integrated into the existing site grades with less cost and impact to the site and adjacent properties than a use in the LI/BP zone. The MX zone also promotes the reduction of urban sprawl and provides opportunities for employees to walk to their jobs. Additionally, according to an economic analysis provided by Johnson Economics, LLC., the redesignation of this property will have no substantial impact on the city's available employment land. As shown in the traffic memo complete by H. Lee & Associates on January 28, 2022, the proposed change will increase the potential weekday and peak hour trips at for the site. Any future application will be required to complete a traffic study to determine actual trips for a project and any development in the existing or proposed zone would increase trips of the existing condition. As will be discussed in more detail later in this narrative, the proposed change is also not anticipated to have a significant impact on the existing or proposed parks and open space within the vicinity of the site.

C. An explanation of why the current comprehensive plan is deficient or should not continue in effect;

Response: The subject site is within the Grass Valley area of Camas. The proposed change from Industrial to Commercial will not remove the opportunity for jobs to be developed and will widen the range of potential jobs related uses as well as providing the opportunity to develop residential uses on the site and help address the need for housing diversity. The existing Comprehensive Plan designation of Industrial and land use zoning of LI/BP allows for uses that generally require larger building footprints and large, flat parking and maneuvering areas. With the existing grades on site, development requiring a large, flat footprint will be costly, and less desirable to develop and have greater impacts than a use that could be integrated more easily into the slopes. Existing allowed uses will also be generally less compatible with the adjacent golf course and MX parcels to the southeast. The proposed modification will also allow for the reduction of urban sprawl and provides the opportunity for employees to walk to their jobs.

D. A statement of how the proposed amendment complies with and promotes the goals and specific requirements of the growth management act;

Response: Consistent with the Washington State Planning Goals in RCW 36.70A.020, the subject property is within Camas' urban growth area, where adequate public facilities are available. NE Camas Meadows Drive is fully developed with water, sewer, and other necessary utilities available at the site. This amendment will increase the inventory of land within the MX zone allowing for dense development that supports urban growth and reduction of low-density sprawl. Based on the surrounding office and recreational uses, additional mixed-use commercial and residential development will help promote a diversity of transportation types. Increasing the inventory of available land for residential use in a commercial mixed-use setting helps to provide more housing types and potentially provides more available housing to the market. As previously noted, the proposed conversion of a ±5.0-acre parcel from an Industrial designation to Commercial and rezoning it to MX will have no substantial impact on available employment land. This amendment will result in a higher diversity of commercial and residential uses in the area, which will promote economic development within the City of Camas, while maintaining the goal to reduce sprawl.

E. A statement of what changes, if any, would be required in functional plans (i.e., the city's water, sewer, stormwater or shoreline plans) if the proposed amendment is adopted;

Response: This amendment does not require changes to any of the City's functional plans. The subject property is not within the City's shoreline jurisdiction. This application includes a Transportation Impact Analysis, which identifies that NW Camas Meadows Drive, and the surrounding transportation infrastructure is sufficient to support any traffic generated by this amendment. The necessary public utilities, water and sewer, are available to the site. Any future development will be required to manage stormwater on site. There are no shorelines on the site.

F. A statement of what capital improvements, if any, would be needed to support the proposed change which will affect the capital facilities plans of the city;

Response: The subject property is situated within city limits. Public facilities have necessary capacity, utilities are available, and NW Camas Meadows Drive is fully improved. No capital improvements are necessary to support this amendment.

G. A statement of what other changes, if any, are required in other city or county codes, plans, or regulations to implement the proposed change; and

Response: Other than the proposed Comprehensive Plan amendments, no other changes to existing city or county codes are necessary.

H. The application shall include an environmental checklist in accordance with the State Environment Policy Act (SEPA).

Response: A SEPA checklist, including Section D for non-project actions, is provided in the application package.

CITY OF CAMAS COMPREHENSIVE PLAN GOALS

Chapter 2 – Housing

H-1: **Maintain the strength, vitality, and stability of all neighborhoods and promote the development of a variety of housing choices that meet the needs of all members of the community**

Response: As currently zoned, the site does not allow for residential development. Redesignating the site to Commercial with an associated rezoning to MX will allow for the potential development of all housing types allowed in the City of Camas and provide opportunity for housing to meet needs recently identified in the City of Camas Housing Action Plan (HAP). These goals include developing housing to accommodate growth, diversifying the housing mix, increasing housing affordability, and preserving existing affordable housing. One method would be upzoning, which a MX zone will allow for. Additionally, Strategy 1 identifies expanding the housing opportunity in the MX zone and Strategy 2 identifies targeted rezones, which will suit the property as it is abutting other MX zoned properties.

H-2: **Create a diversified housing stock that meets the needs of all economic segments of the community through new developments, preservation, and collaborative partnerships.**

Response: The potential for residential development within the MX zone increases the availability and variety of housing in Camas. Rezoning to MX provides for the development of all allowed housing types in the City, giving the opportunity for diversified housing that can meet the needs of all economic segments of the community, while maintaining job lands.

H-3: **Encourage and support a variety of housing opportunities for those with special needs, particularly those with challenges relating to age, health, or disability.**

Response: The proposed MX zone for the site will allow for the opportunity to develop any of the housing types allowed within the City of Camas. The flexibility in development opportunities provides the potential for housing opportunities for residents with different challenges.

Chapter 6 – Economic Development

ED-1 **Maintain a diverse range of employment opportunities to support all residents and provide a setting and quality of life that attract and retain businesses.**

Response: The existing LI/BP zone offers a range of economic development opportunities. The proposal to change to the MX zone will greatly expand on the economic development opportunities by allowing many new commercial uses while still allowing many of the same uses that are allowed under the current LI/BP zone. The expansion of the available economic uses provides for the goal of maintaining a diverse range of employment opportunities. Additionally, the MX zone allows for residential uses which can increase the quality of life for employees and help attract and retain businesses to the surrounding area.

ED 3 **Promote a cooperative industrial business park in which businesses and the City share resources efficiently to achieve sustainable development, with the intention of increasing economic gains and improving environmental quality.**

ED-3.1 Promote the development of a subarea plan that will capitalize on the creation and retention of industries that provide family-wage jobs.

Response: The proposed change to the MX zone for the site will greatly expand upon the economic development opportunities, while also continuing to allow most of the uses currently allowed under the LI/BP zone. This will allow for a greater opportunity for the creation and retention of family-wage jobs. The proposed change will also allow for the development of residential, which provides the potential for employees to live closer to their jobs.

ED-3.2 Subarea planning should capitalize on existing facilities and infrastructure and include a mix of uses that are trail- and transit-oriented and designed with high-quality streetscape appeal.

Response: The proposed change to the MX zone will provide the opportunity for a greater mix of uses while utilizing the existing infrastructure that exists in NE Camas Meadows Drive. The potential development under the MX zone allows for development that can provide high-quality streetscape appeal and with design review required for MX development, it provides the City opportunity to have input on the streetscape. Adding the opportunity to develop residential within the MX zone provides for uses that are more associated with trails and provide for the potential that employees could walk or bicycle to work versus needing to drive.

ED-3.3 Protect employment land from conversion to residential uses by requiring an analysis of adequate buildable lands in Grass Valley to meet 20-year employment projections prior to land conversion approval.

Response: The proposed modification will change the site zoning for LI/BP to MX. As previously discussed, the change will expand the allowed job creating uses for the site, while also adding the potential for residential uses. The allowed range of uses under the MX zone also helps to meet the goal of reducing urban sprawl by providing the opportunity for employment and residential uses to be developed together in the same development. Findings from an Economic Study included with this application provided by Johnson Economics, LLC state that the conversion of a ±5.0-acre parcel from the LI/ BP zone to the Commercial MX zone will not reduce the available employment land below the amount necessary to meet 20-year employment projections in the Grass Valley area. These findings are consistent with the City's Comprehensive Plan findings (Section 1.3 Land Use) that currently designated employment lands to exceed the necessary capacity to meet the job projections.

CITY OF CAMAS PARKS AND OPEN SPACE

Response: The subject site is in the vicinity of Lacamas Lake and the parks and trails surrounding the lake. The public park system surrounding Lacamas Lake covers a large area with many miles of trails and many acres of park, including Fallen Leaf Park, Heritage Park, Lacamas Regional Park, Lacamas Park Trails, the Lacamas Creek Trail, and the Heritage Trail. The park and trail system is regional in nature and serves residents throughout Camas and Clark County. In addition, there are two potential neighborhood parks and multiple proposed trails shown on the Camas Parks Recreation and Open Space Plan (PROS) within one mile of the subject site. As these two parks develop, they will provide additional options for potential residents or employees of a mixed-use development, as well as the surrounding neighborhood. It is not anticipated that a change from an LI/BP zone to a MX zone for the five-acre site will create a significant impact to the current and proposed park system, given the recently approved Comprehensive Plan Amendment and zone change of the neighboring parcels to the southeast. Additionally, future residential development will be required to pay applicable park impact fees.

IV. Conclusion

The Applicant is proposing to redesignate the subject site from Industrial to Commercial, with an associated zone change from Light Industrial/Business Park to Mixed Use. The proposed change will provide for greater economic and residential development opportunities that meet the goals of the Camas Comprehensive Plan and Housing Action Plan.

The submittal requirements have been met and the required findings made for the applicable approval criteria. These findings serve as the basis for the City Council to approve the application and are supported by substantial evidence in the application materials.

H. Lee & Associates, PLLC
Civil Engineering, Traffic Engineering, and Planning

P.O. Box 1849
Vancouver, WA 98668
Phone: (360) 727-3119

MEMORANDUM

JEONG HANN LEE
STATE OF WASHINGTON
43845
PROFESSIONAL ENGINEER
1/28/22

To: City of Camas Staff

From: Hann Lee, P.E.

Date: January 28, 2022

Subject: Romano Development Rezone
Trip Generation Memorandum

INTRODUCTION

The proposed Romano Development Rezone is located at 4711 NW Camas Meadows Drive 986026906 in Camas, Washington and is comprised tax lot 986026906. The existing tax lot is approximately 5.0 acres (217,800 square feet) and is currently zoned light industrial/business park (LI/BP). The rezone proposal is to change the existing zoning from IL/BP to MX to match the abutting parcels to the east.

The build out of the existing IL/BP zoning was based on a floor area ratio (FAR) of 0.25 of the net building area (217,800 square feet). Applying this FAR yields a build out of 54,450 square feet of IL/BP space. For trip generation purposes the build out of the existing zoning was assumed to be ITE Code 770 (Business Park) use.

The applicant does not know at this time what the mix of land uses will be with the proposed MX zoning. Therefore, to estimate the likely trip generation impact of the requested MX zoning, a mix of uses allowed by the MX zoning in CMP Table 18.07.030-1 not likely to be exceeded was developed. For trip generation purposes the build out of the proposed MX zoning is assumed to be comprised of the following land uses and densities:

- Single Family Detached Housing (ITE Code 210) – 12 units
- Single-Family Attached Housing (ITE Code 215) – 18 units
- Low-Ride Residential with Ground Floor Commercial (ITE Code 230) – 90 units
- General Office Building (ITE Code 710) – 7,500 square feet
- Strip Retail Plaza >40k sf (ITE Code 822) – 7,500 square feet

TRIP GENERATION COMPARISON

Estimates of daily, A.M. peak hour, and P.M. peak hour trips generated by the build out of the existing and proposed zonings were developed from rates published in "Trip Generation, 11th Edition" (Institute of Transportation Engineers, 2021). The build out of the existing zoning is expected to generate 677 daily, 74 A.M. peak hour (63 in, 11 out), and 66 P.M. peak hour (17 in, 49 out) net new trips and is summarized in Table 1. The build out of the proposed zoning is expected to generate 1,042 daily, 86 A.M. peak hour (35 in, 51 out), and 113 P.M. peak hour (61 in, 52 out) net new trips and is summarized in Table 2. The proposed zoning is expected to generate 365 more daily, 12 more A.M. peak hour (-28 in, 40 out), and 47 more P.M. peak hour (44 in, 3 out) net new trips. Table 3 summarizes the trip generation comparison of the existing IL/BP zoning and the proposed MX zoning.

Table 1. Trip Generation Summary for Existing IL/BP Zoning

	Amount	Average Daily	A.M. Peak			P.M. Peak		
			In	Out	Total	In	Out	Total
Existing (IL/BP) Zoning – General Light Industrial (ITE Code 110)								
Rate per 1,000 square feet (ksf)		12.44	1.15	0.20	1.35	0.32	0.90	1.22
Trips	54.450 ksf	677	63	11	74	17	49	66

Table 2. Trip Generation Summary for Proposed MX Zoning

	Amount	Average Daily	A.M. Peak			P.M. Peak		
			In	Out	Total	In	Out	Total
Proposed (MX) Zoning – Single-Family Detached Housing (ITE Code 210)								
Rate per dwelling unit		9.43	0.18	0.52	0.70	0.59	0.35	0.94
Trips	12 units	113	2	6	8	7	4	11
Proposed (MX) Zoning – Single-Family Attached Housing (ITE Code 215)								
Rate per dwelling unit		7.20	0.15	0.33	0.48	0.32	0.25	0.57
Trips	18 units	130	3	6	9	5	5	10
Proposed (MX) Zoning – Low-Rise Residential with Ground Floor Commercial (ITE Code 230)								
Rate per dwelling unit		3.44	0.10	0.34	0.44	0.26	0.10	0.36
Trips	90 units	310	9	31	40	23	9	32
Proposed (MX) Zoning – General Office Building (ITE Code 710)								
Rate per 1,000 square feet (ksf)		10.84	1.34	0.18	1.52	0.24	1.20	1.44
Trips	7.500 ksf	81	10	1	11	2	9	11
Proposed (MX) Zoning – Strip Retail Plaza >40k (ITE Code 822)								
Rate per 1,000 square feet (ksf)		54.45	1.42	0.94	2.36	3.29	3.30	6.59
Trips	7.500 ksf	408	11	7	18	24	25	49
Net Trips for Proposed MX Zoning		**1,042**	**35**	**51**	**86**	**61**	**52**	**113**

Table 3. Trip Generation Comparison for Romano Development Rezone

	Average Daily	A.M. Peak			P.M. Peak		
		In	Out	Total	In	Out	Total
Existing (IL/BP) Zoning	677	63	11	74	17	49	66
Proposed (MX) Zoning	1,042	35	51	86	61	52	113
Proposed Rezone Trip Increase	**365**	**(28)**	**40**	**12**	**44**	**3**	**47**

CITY OF CAMAS
Memorandum

TO: Robert Maul, Interim Community Development Director

FROM: James Carothers, Engineering Manager/City Engineer

DATE: September 7, 2022

SUBJECT: CPA 22-01 Pedwar Property Zone Change Request from LI/BP to MX

Zone changes require consideration of potential substantive impacts to the citywide water, sewer and transportation systems. When reviewing the potential changes in use for this 5-acre parcel, staff finds that any changes in use of this property are negligible and do not warrant revisions to the current Water System Plan, General Sewer Plan or the Transportation Plan. Any impacts will be addressed at the time of application for development.

Jim E Carothers

James E. Carothers, Engineering Manager/City Engineer

JOHNSON ECONOMICS

LAND NEED ANALYSIS FOR MIXED USE DEVELOPMENT ON A SITE IN CAMAS, WASHINGTON

JOHNSON ECONOMICS, LLC
621 SW Alder St, Suite 605
Portland, Oregon 97205

PREPARED FOR:
ROMANO DEVELOPMENT
FEBRUARY 2022

JOHNSON ECONOMICS

TABLE OF CONTENTS

I. INTRODUCTION

JOHNSON ECONOMICS was retained by ROMANO DEVELOPMENT to evaluate the feasibility of a multi-family residential development on a site in northwest Camas, Washington. The site in question is currently zoned Light Industrial/Business Park (LI/BP). This report assesses the appropriateness of rezoning the land from the industrial designation to a designation that would allow for the multi-family housing development. This analysis compares the suitability of the site for the two alternative uses (business park vs. mixed use) based on market and planning criteria.

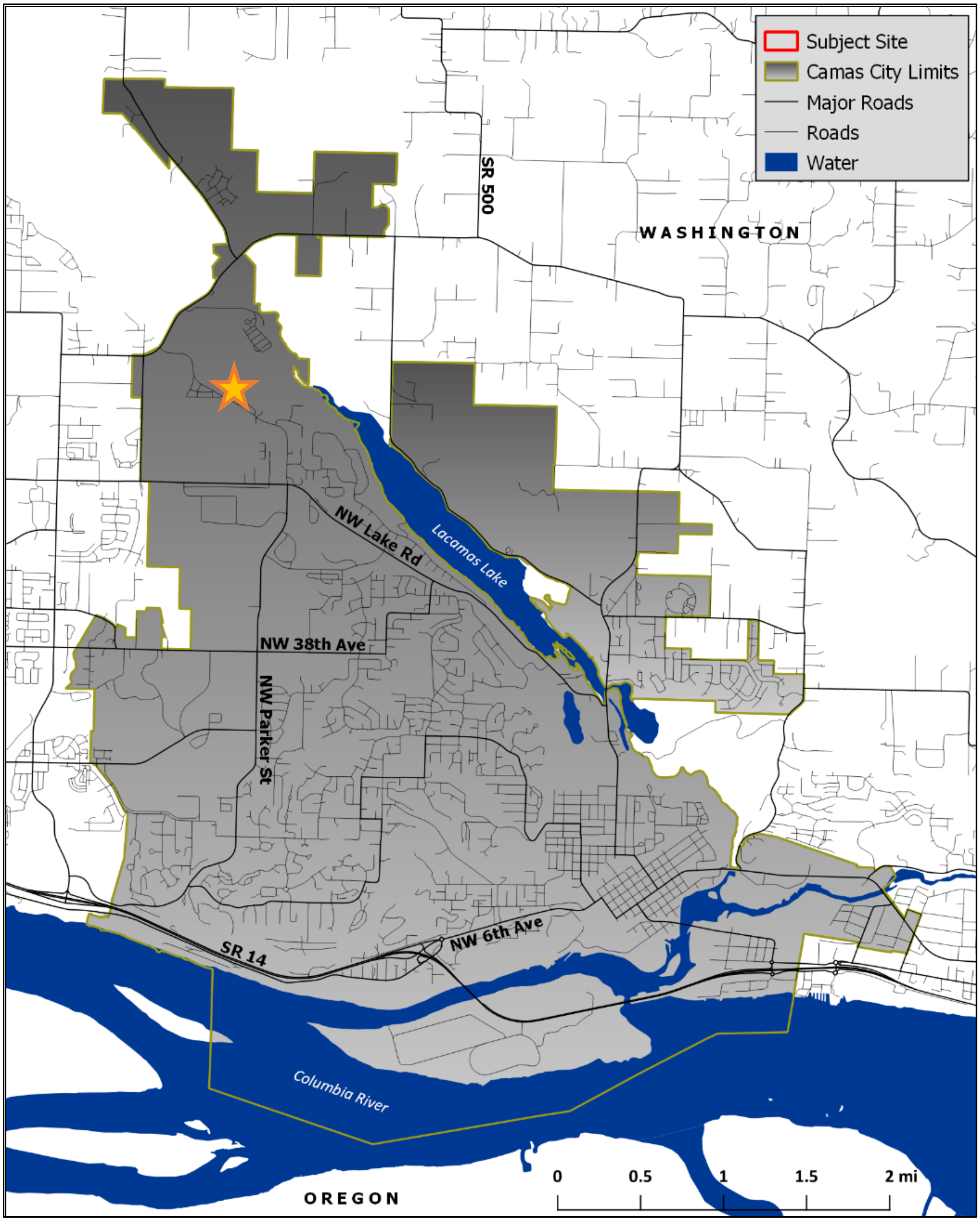
JOHNSON ECONOMICS aims to inform this decision by taking the following steps:

- Review the City of Camas' current relevant planning documents and evaluate, update, and/or modify forecasts and capacity estimates based on current information.
- Discuss the relative suitability of the site for either an Industrial Business Park or Mixed Use.
- Discuss most current projections for employment land needs and land inventory based on estimates from the Camas 2035 Comp Plan and Clark County VBLM and Buildable Lands Report.
- Estimate market demand for residential and commercial uses.
- Reconcile the above to determine the "need" and suitability for additional LI/BP vs. mixed-use commercial land capacity at the subject site.

FIGURE 1.1: SITE CONTEXT

SOURCE: Bing Maps, Johnson Economics

FIGURE 1.2: SUBJECT LOCATION



Source: Johnson Economics, Clark County, US Census Bureau TIGER, Metro RLIS

II. SITE ANALYSIS

THE SUBJECT SITE

The subject site is a roughly triangular-shaped parcel, consisting of one taxlot. The parcel is five acres in size. The site is partially forested and located on Camas Meadows Drive in Northwest Camas. The site features a downward slope from the south (Camas Meadows Drive) to the north (golf course fairway). Access will be from Camas Meadows Drive, a three-lane arterial street.

Broadly speaking, the site is located near the boundary of a large area planned for light industrial or business park employment uses (to the west) and a large area planned for residential and commercial uses (to the east and south).

The site and much of the surrounding area is zoned LI/BP. However, there is mixed use zoning located adjacent to the site to the east, and multi-family zoning (MR-18) located nearby to the southeast. There is also business park zoning to the east, but this area is now under development as the Village at Camas Meadows, which includes multi-family and single-family residential. Therefore, the site sits at the boundary of residential and employment neighborhoods.

Surrounding Uses: The site is bordered directly to the north by the Camas Meadows Golf Club and to the south by an existing business park development across Camas Meadows Drive. There are new multi-family and single-family residential subdivisions under development roughly 0.25 miles southeast of the site. Directly to the east are roughly 10-acres of land zoned MX, which are planned to house similar uses as those proposed at the subject site.

There is also substantial remaining vacant land in the immediate area, mostly in the area zoned LI/BP to the west north, and south, but also in the MR-18 zone directly to the south.

Services: The subject site lies roughly 1.25 miles by road to the nearest concentration of shopping and commercial services on NE 192nd Avenue. Commercial tenants in the area include Costco, Walmart, JC Penny, PetSmart, Home Depot, and Lowe's, as well as a number of smaller stores, restaurants, and service providers. The site also offers good access to recreational amenities, like the Camas Meadows Golf Club, Lacamas Lake, Lacamas Heritage Trail, and Harmony Sports Complex.

There is land zoned for commercial use along Lake Road to the south, and in the Green Mountain Village area to the north, which will be somewhat closer if in eventually develops with commercial uses. The site is over 4 miles from Downtown Camas via Lake Road and Everett Street.

PROPOSED ALTERNATIVE USES

There is a proposal for change in Comp Plan designation for the subject site, from LI/BP to a mixed-use designation that allows multi-family development. As noted, the site sits at the boundary of employment and mixed-use zones.

The purpose of the Light Industrial/Business Park (LI/BP) zone according to the Camas Municipal Code is:

> *The Light Industrial/Business Park (LI/BP) district is intended to provide for employment growth in the city by protecting industrial areas for future light industrial development. Design of light industrial facilities in this district will be "campus-style," with ample landscaping, effective buffers, and architectural features compatible with, and not offensive to, surrounding uses. Commercial development in the LI/BP district is limited to those uses necessary to primarily serve the needs of the surrounding industrial area, and is restricted in size to discourage conversion of developable industrial land to commercial uses. (Chapter 18.21.010)*

The mix of uses alternatively proposed at the site are likely to include multi-family residential uses. The commercial zones which would allow for some residential uses as part of a development are the Mixed Use Zone (MX), Community Commercial (CC), Downtown Commercial (DC) and Regional Commercial (RC). The CC, DC and RC zones placed conditions on mixed uses that are likely to make them inappropriate for the subject site. The MX zone allows mixed uses as a conditional use and provides for more flexibility in how they might be configured.

> *MX Mixed Use. This zone provides for a wide range of commercial and residential uses. Compact development is encouraged that is supportive of transit and pedestrian travel.* (Chapter 18.21.050)

Site Suitability for Alternative Uses

The following is a general discussion of the suitability of the site for the alternative uses based on market considerations, physical configuration, and access. While the site may be technically suitable for an industrial or business park use, there are multiple reasons that it is likely more suitable for a mix of commercial and residential uses.

Light Industrial/Business Park

The site would generally be physically suitable for light industrial or business park development, as evidenced by the presence of some existing business park developments along Camas Meadows Drive, but due to some site limitations and location factors is not as well suited for this use as the alternative. At four acres, it is of sufficient size to hold one or more office, industrial or "flex space" type developments.

- **Compatibility:** Some industrial and flex-space users may not be compatible with the existing golf course use to the north edge of the site. These may include businesses that create negative externalities such as noise, smoke or other fumes, excessive industrial yard machinery or storage, or heavy truck traffic. All of these factors would make an industrial user an unattractive neighbor to the golf club. At the same time, employees at the site would be unlikely to take advantage of the proximity to the golf facilities during most daylight hours, as golf tends to be more of a residential lifestyle amenity than a corporate park amenity.

- **Topography:** The sloping topography of the site might present a challenge for industrial users who prefer flat land. The preparation and grading of this land must not be cost prohibitive, because typically industrial users pay the least of the major uses for buildable land (i.e. excessive land development costs can render a site infeasible for industrial use). The topography would present less of a challenge to a business park development offering more standard office space.

- **Traffic/Access:** The area is generally accessible for campus-style employment uses via Camas Meadows Drive which is a three-lane arterial. In theory if enough of the vacant LI/BP lands in the northwest Camas area were to build out, this could eventually lead to traffic congestion at high-volume times of the day.

- **Market Conditions:** The Camas and East Vancouver submarket has seen healthy growth of industrial and office park users and new jobs during the recent economic recovery. The area has attracted multiple high-paying professional firms in recent years and remains a draw for Portland-metro business owners looking to move to a more favorable tax environment. According to data from CoStar Analytics, the strength of the local office market has fluctuated over time. While rent levels have risen steadily, vacancy has at times exceeded the 10% threshold sought in a healthy market.

  Currently, there are thousands of vacant square feet of space available at the Camas Meadows Corporate Center across the street from the subject site. As discussed more in Section III of this report, there is also estimated to be an oversupply of industrial and business park land to accommodate new development. For these reasons, Johnson Economics does not estimate that there is currently a significant shortage or even tight supply of industrial, business park or office space in the Camas area for the foreseeable future.

Commercial and Residential Mixed Use

The site would be physically suitable for a mix of commercial and residential uses and is an adequate size for such a development.

- **Compatibility:** The site is compatible for a range of small commercial users including convenience retail, small dining establishments and small office users. These uses can benefit from a location between industrial parks to the west, residential neighborhoods to the east, and traffic to and from the golf course.

  Residential housing is a traditional compatible use next to a golf course, and this development would benefit from being near the clubhouse and driving range. The established neighborhoods to the east around the golf course demonstrate that this is a desirable location for residents, offering excellent access to nature, views, and livability amenities. New single-family homes in the area sell in the range of $400,000 to well over one million dollars.

  The site would be suitable for a range of residential housing types from attached multi-family apartments to townhomes to condominiums. Based on currently achievable rents and construction costs, the likely development form for housing on this site would be two-to-three story wood-frame construction.

- **Topography:** Multi-family developments are typically feasible on more uneven topography due to the ability to locate multiple buildings and parking areas at different elevations. Commercial uses at the site would need more even building sites and parking lots. However, residential and/or commercial developments can also typically afford higher cost for land preparation than industrial uses.

- **Traffic/Access:** The area is accessible via Camas Meadows Drive. NW Lake Road to the south offers access to the regional network of major arterials and highways. The quiet location is likely to be a key attractor to prospective residents at the site. The site location is somewhat distant from other commercial services. This would provide an advantage for the right mix of commercial businesses at the site, who could serve the on-site tenants, local neighborhoods, and nearby employers.

- **Market Conditions:** The subject site is a good location for small businesses, providing good access and visibility, with a built-in local customer base. The greatest concentrations of commercial shopping and service are all located more than a mile from this area. Demand for these businesses will continue to grow as Camas experiences strong residential and employment growth. As Section III of this report presents, the Camas 2035 plan forecasts strong growth in commercial jobs over coming decades, and significantly outnumbering industrial jobs.

  Section IV of this report discusses estimates of demand for housing types by age and income groups. Since 2000, Camas has grown by nearly 4,000 households, or 89% growth. This translates to robust annual growth of 3.2%, in comparison to 1.4% growth in Washington State, and 0.8% in the United States. The community is forecasted to continue to add an average of roughly 200 households each year over the next five years. The housing supply for both owner and rental units must continue to increase to meet the need of these new residents.

  Camas is a strong residential development market, with median sale price of homes approaching $500,000 and 30% higher than the prior peak in 2007. Annual home sales have increased from 415 to 770 between 2007 and 2021, and housing units permitted rose from 130 to 650 per year. This pace already exceeds the forecasted growth rate of the Camas 2035 plan.

III. LAND CAPACITY VS. DEMAND (CAMAS 2035)

CAMAS 2035 FINDINGS

Figure 3.1 presents the estimated buildable acres of commercial, industrial and residential land in Camas as identified in the City's most recently adopted Camas 2035 Comp Plan. Camas 2035 was adopted in 2016 and generally reflects the land demand and capacity estimates from 2015. The original source of the buildable land inventory was the 2015 Vacant Buildable Lands Model (VBLM) of Clark County.

The adopted Comp Plan estimated 464 net acres of buildable commercial land (generally retail and office), and an estimated 660 net acres of buildable industrial land. There was an estimated supply of 876 net buildable acres of residential land.

After the projected amount of land need over 20 years was factored, the analysis adopted in the Comp Plan finds that there is a surplus of land for all three land uses. The Comp Plan finds the narrowest 20-year surplus of commercial land (127 acres), with a larger surplus of industrial lands (167 acres), and the largest surplus of residential land (231 acres).

FIGURE 3.1: ESTIMATED LAND SUPPLY AND DEMAND
CITY OF CAMAS COMPREHENSIVE PLAN (2015 – 2035)

Land Use Category	Density	Demand (2035)			Total Land Supply / Capacity		Surplus Supply / Capacity	
		Jobs	Units	Acres	Net Acres (CP)[1]	Capacity (jobs/units)	Net Acres (CP)	Capacity (jobs/units)
Commercial	20 jobs/ac	6,744		337	464	9,280	127	2,536
Industrial	9 jobs/ac	4,438		493	660	5,940	167	1,502
	Total:	***11,182***		***830***	***1,124***	***15,220***	***294***	***4,038***
Residential	6 units/ac		3,868	645	876	5,256	231	1,388

[1] Acreage based on VBLM, but further refined by City. Finding of more net acres than in VBLM.
Source: Camas 2035, Table 1-1; Clark County Vacant Buildable Lands Model (2015)

Draft Clark County Buildable Lands Report (2022): An updated VBLM and growth forecasts for Clark County, including Camas, have been developed over the past year and is expected to be adopted soon. This updated VBLM found a diminished supply of net buildable lands in all of the land categories after factoring the development that has taken place over the last few years:

- 302 acres of Commercial Land (down from 464 ac. in 2015)
- 647 acres of Industrial Land (down from 660 ac.)
- 481 acres of Residential Land (down from 876)

The draft Buildable Lands report provides estimated development pace from 2016-2020. At this pace, the remaining acreage represents the following land supply by category:

- Over 50 years of Commercial Land (6 acres/year)
- Over 400 years of Industrial Land (1.6 acres/year)
- 8 years of Residential Land (59.6 acres/year)

Forecasted Job Growth (Land Demand): The Camas 2035 Comp Plan presents a forecast of land demand for 337 commercial acres and 493 industrial acres over the planning period. However, due to the higher assumed density of jobs on commercial lands (20 jobs/ac.), this amounts to many more commercial jobs than industrial jobs (6,744 vs. 4,438 respectively). (The draft Buildable Lands Report does not include specific job forecasts, only land capacity to house jobs.)

The Comprehensive Plan projects 11,182 new jobs in Camas by 2035, based on estimates from the Clark County Buildable Lands Report (2015). Given the 9,093 jobs from 2013 shown in the Comprehensive plan, this means that the city has forecasted average annual employment growth in the range of 3.7% per year.

Though average annual growth in the city was only 1.5% from 2001 to 2015, growth has been rapid since the downturn. From 2010 to 2015, the city added jobs at an average annual rate of 5.4%, and at 5.0% after 2016, prior to the shock of the pandemic recession. This growth was faster than the 3.6% and 4.3% growth seen county-wide in those time frames, respectively.

As noted above, the latest updated estimate of buildable land in Camas (2020) found that there is a significant amount of remaining employment land:

- 302 acres of Commercial Land (with capacity for 6,033 jobs)
- 647 acres of Industrial Land (with capacity for 5,825 jobs)

This is a total estimated land capacity to house 11,858 jobs as of 2020. *This is a remaining capacity that is greater than the total projected new job growth (11,182) in the Camas 2035 plan, even five years after that plan's adoption*.

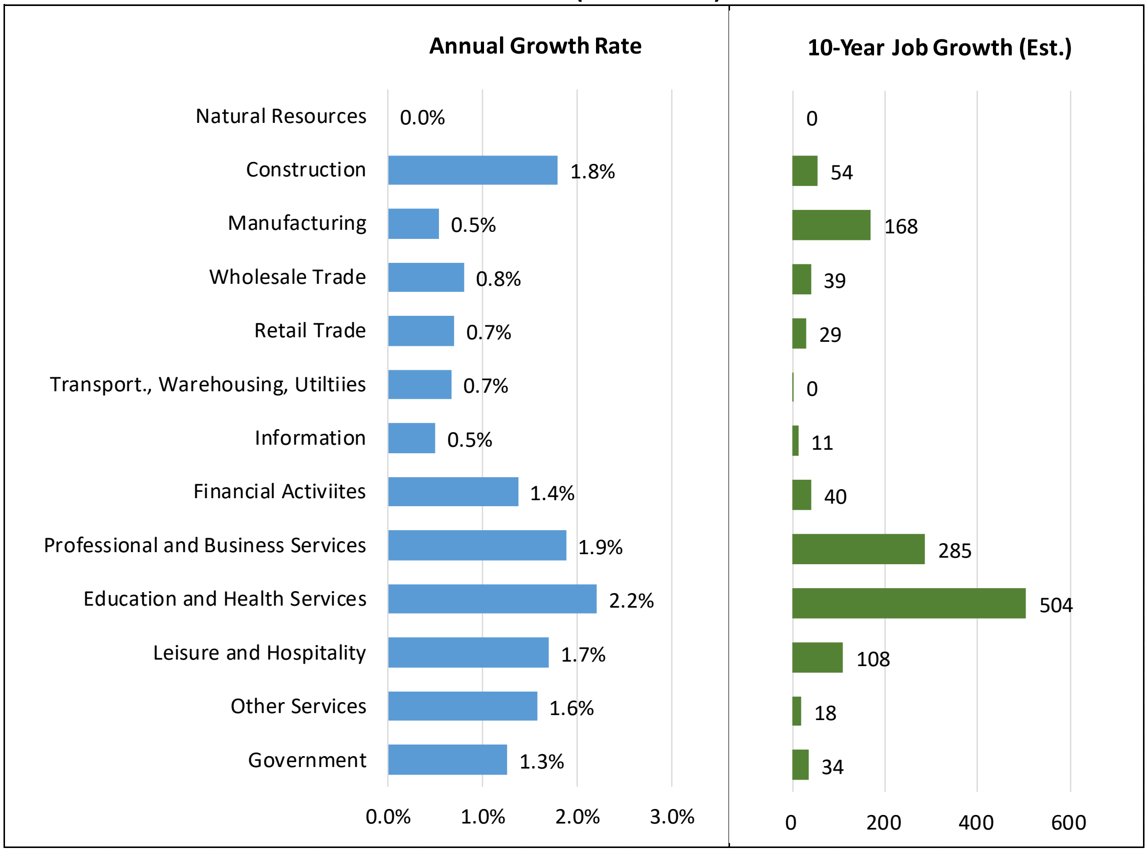
Supplemental Employment Sector Analysis: JOHNSON ECONOMICS prepared additional analysis of employment growth based on the forecasted growth rate of major industry sectors in Southwest Washington. This forecast is based on 10-year growth rates prepared by the Washington State Employment Security Department (ESD) for the broader Southwest Washington region. Because the methodologies differ, the overall job growth forecast does not match that found in the Comp Plan. However, this does provide more granularity on what employment sectors are expected to grow fastest in the region, and whether or not these tend to be industrial, office or retail jobs (Figure 3.2, following page.)

This analysis utilized the estimated employment base level of 9,093 as presented in the Camas 2035 plan, distributed across sectors as reported by the US Census Longitudinal Employer-Household Dynamics program. Applying the projected growth rates from the ESD, we see that the fastest growing industries are projected to be Education and Health Services (2.2% annually), Professional and Business Services (1.9%), and Construction (1.8%).

In terms of absolute growth in number of jobs, the greatest local growth is expected in Education and Health Services, and Professional and Business Services. There next highest number of jobs are in manufacturing and tourism-related sectors. (These numbers do not match the adopted forecast in the Camas 2035 Plan, and therefore should be viewed as an indicator of projected growth relative to other sectors.)

This alternate forecast suggests that **the greatest number of new jobs will be found in sectors that tend to use commercial office and retail space (and land), and fewer new jobs in sectors that use industrial space.** The major users of industrial space (manufacturing, transportation/warehousing, construction) are projected to make up roughly 16% of new employment under this alternative forecast. The sectors which are major users of office and retail commercial space make up an estimated 82% of new employment.

FIGURE 3.2: ALTERNATE 10-YEAR JOB GROWTH PROJECTION
CITY OF CAMAS (2015 – 2025)



SOURCE: Washington State Employment Security Department, Johnson Economics

IV. Residential Demand Analysis

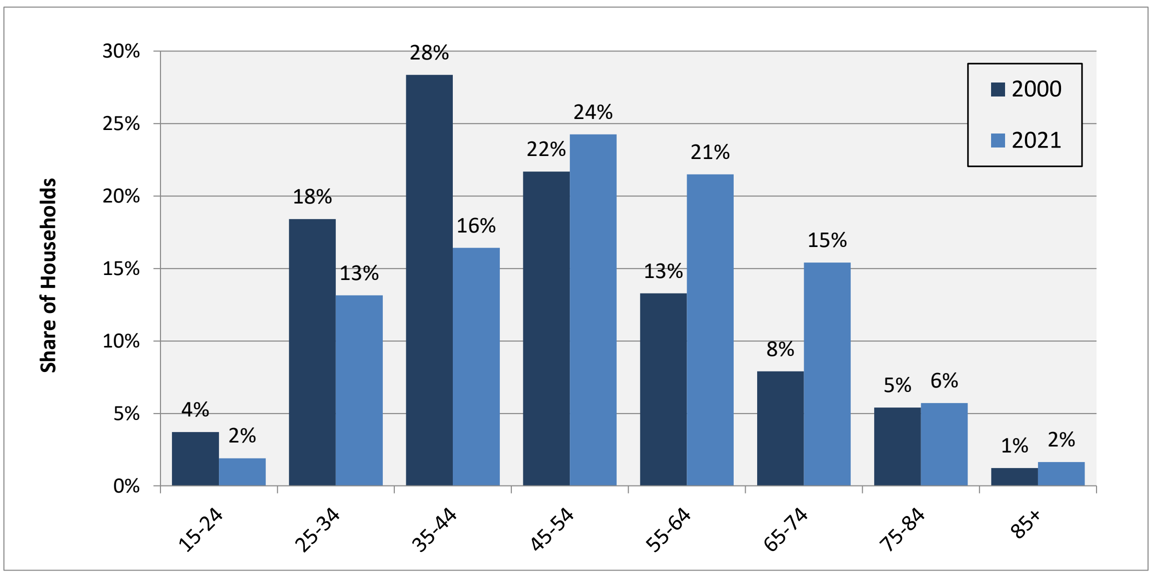
In this section, we analyze the market depth for rental apartments within the City of Camas, to determine the potential demand for housing at the subject site as part of a mixed-use development. We provide estimates of turnover in the existing household base as well as estimates of current demand growth over the coming five years. The forecast supports the continued robust growth of the Camas community and need for housing.

Historical Growth

According to estimates from Environics and the Census, the PMA totaled 8,317 households as of 2020, after adding over 3,850 households since the turn of the millennium. Over this 20-year period, this translates to an average annual growth of 3.2%, which is far above the average growth rate observed in the Portland Metro Area (1.3%). Since 2000, households in Camas have grown significantly older and wealthier on average.

Age of Householder: The following figure displays how the household growth within the market area has been distributed across age groups since 2000. The strongest growth was seen in households aged 45 to 74. All age categories except 15-24-year-olds experienced some growth in absolute terms. But in terms of share of households (%), those aged 45 to 74 grew the most.

Figure 4.1: Age Profile of Camas Households, 2000 and 2021

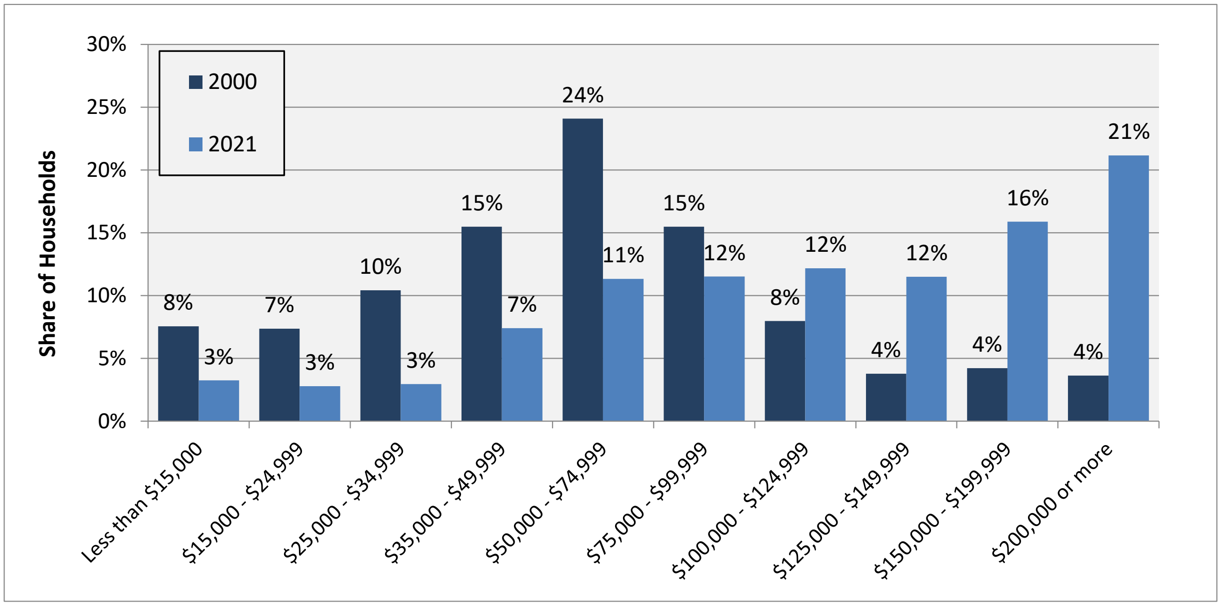


SOURCE: Environics Analytics

The largest total growth seen within an age group was in those aged 55-64. This age group increased by an estimated 1,200 households since 2000. The 45-54 age group and the 65-74-year old age group each grew by roughly 1,000 households since 2000. This group had a smaller population to begin with, however, so the increase represents a 6.8% annual growth, highest among all age groups.

Household Income: The area has become quite affluent over the last two decades, though part of the increase can be attributed to inflation. The realized growth on a net basis has been among households making at least $75,000 per year. Growth is particularly strong among households making more than $100,000 per year. Nearly all the positive growth came from households with incomes above this threshold. The highest-income households, making at least $200,000 per year, increased over ten-fold over the period, faster than any other income group.

FIGURE 4.2: INCOME PROFILE OF CAMAS HOUSEHOLDS, 2000 AND 2020



SOURCE: Environics Analytics

DEMAND GROWTH (2022 - 2027)

JOHNSON ECONOMICS has developed a housing demand model that translates estimates of job growth and household growth into demand for housing of different forms. Our model begins with household growth estimates stratified by age and income, as these are the variables that best predict housing preferences. Our household growth estimates are based on projections by Environics, a third-party data provider that draws on various data sources to identify trends that impact the household base within specific geographies down to a census block group level. We adjust these estimates based on employment growth projections (by age) and migration trends. The goal is for the projections to reflect underlying demand rather than expected realized household growth, which is constrained by supply.

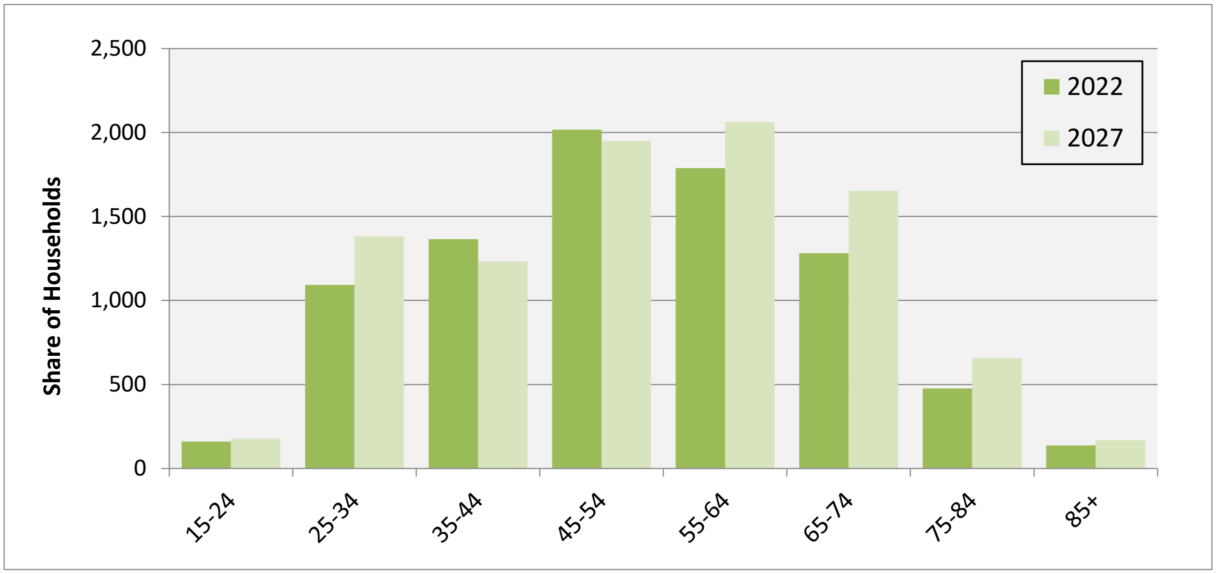
After developing a segmented projection of overall housing demand for the market area, we use local microdata from the U.S. Census Bureau to establish segment-specific rates of housing tenure (owners/renters) and housing type (SF detached/SF attached/multi-family), to derive assumptions of future housing propensity within the segments.

NEW HOUSEHOLD DEMAND, CAMAS

Over the coming five years, Johnson Economics projects an increase of roughly 960 households within Camas, or 190 per year. This represents annual growth of 2.2%. Note that this is based on an extrapolation of historical trends, which in turn is based on realized growth rather than underlying demand not limited by supply constraints. Taking into account job growth and migration, we believe that the household growth is likely to exceed this rate, therefore we believe this is a conservative estimate.

The following chart displays the anticipated change in the number of households by the age of the householder. The projections indicate particular demand growth among young households in the early family-stage, as well as considerable growth in empty-nester and senior segments, reflecting the aging of the baby boomers. The greatest growth is anticipated in those between 55 and 74 years of age.

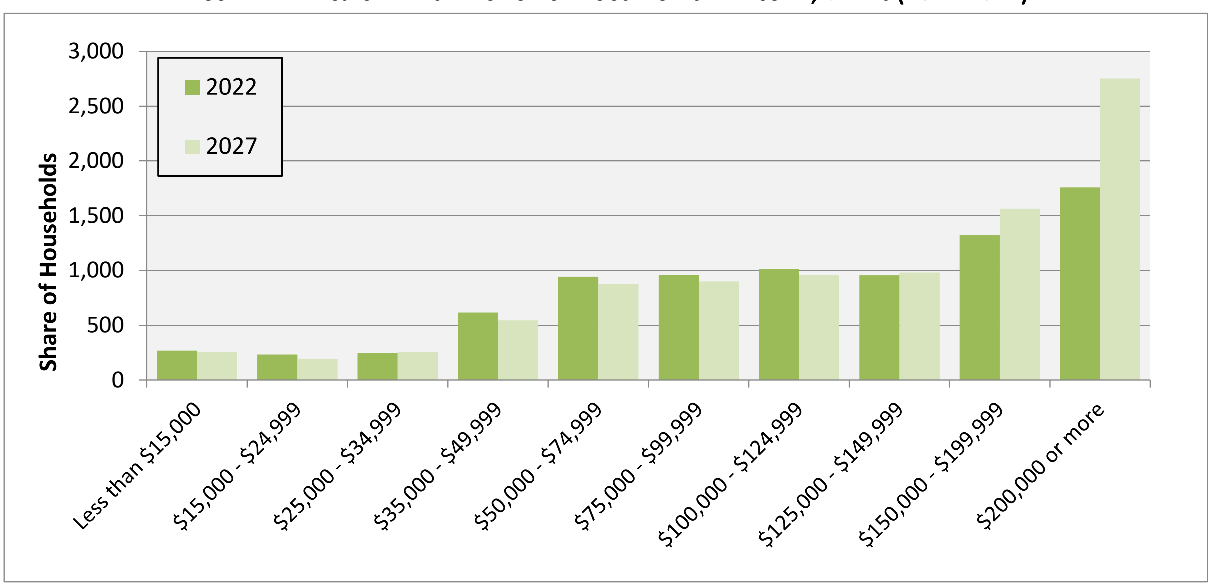
FIGURE 4.3: PROJECTED DISTRIBUTION OF HOUSEHOLDS BY AGE, CAMAS (2022-2027)



SOURCE: Environics, JOHNSON ECONOMICS

With respect to income, the growth is anticipated to be distributed broadly across mid- and upper-income segments, but with the greatest growth continuing to be seen in the highest income categories. The city is expected to continue to develop as an attractive middle- and upscale community for Clark County and Portland-metro workers. The affluent suburban nature of the community will enhance its attractiveness to prospective new residents.

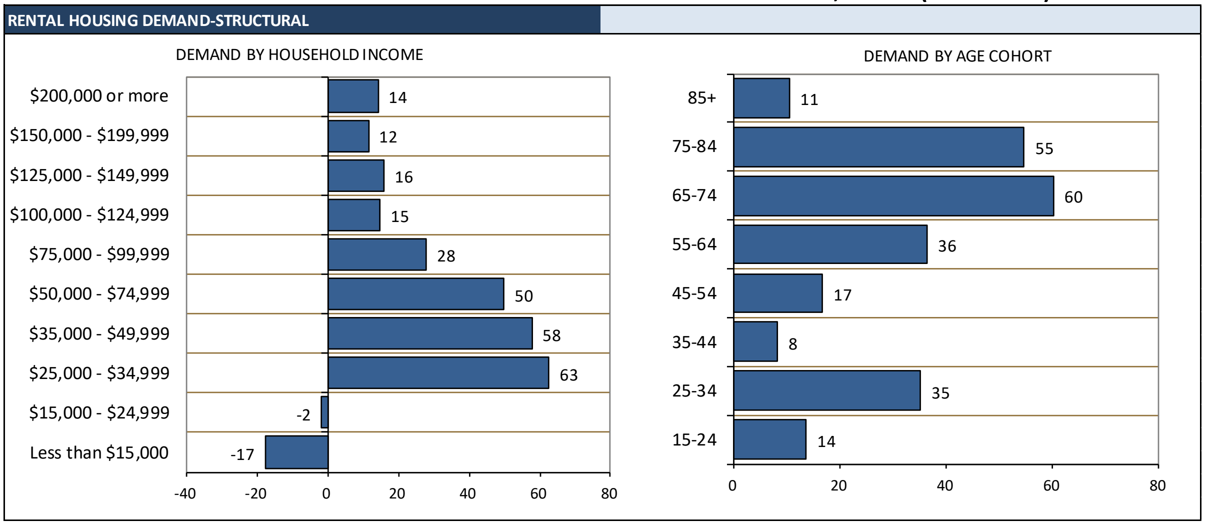
FIGURE 4.4: PROJECTED DISTRIBUTION OF HOUSEHOLDS BY INCOME, CAMAS (2022-2027)



SOURCE: Environics, JOHNSON ECONOMICS

When we apply estimates of future tenure (rent vs. own) and housing type propensity rates to the projected demand, our model indicates that new growth alone will support roughly 240 apartment units over the coming five years, or an average of nearly 50 per year. The net new demand is projected to be concentrated among the lower- to middle-income households who are more likely to rent than own. This trend supports the need for the continued development of new housing options in coming years.

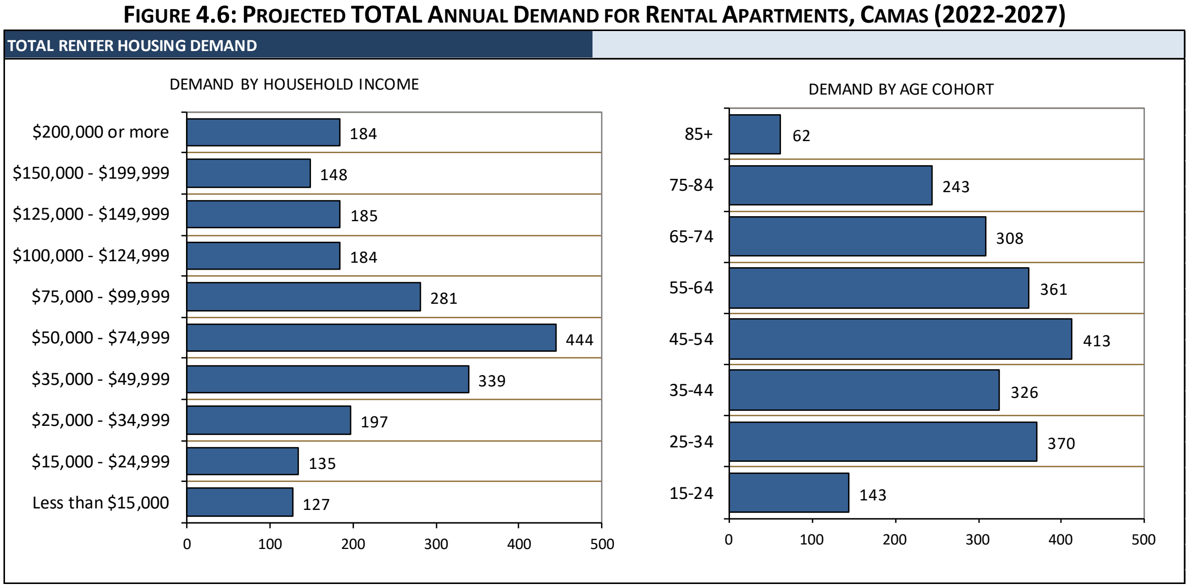
FIGURE 4.5: PROJECTED GROWTH IN DEMAND FOR RENTAL APARTMENTS, CAMAS (2022-2027)



SOURCE: Environics, JOHNSON ECONOMICS

A secondary source of demand is turnover in the existing base of apartment households in the city. When currently renting households move out of their units, newer rental properties have the ability to compete for these renters with newer facilities and up-to-date amenities. We project around 445 rental transactions (new and turnover) per year in the Camas apartment market. These transactions are expected to represent a wider distribution across age and income categories than the net new demand.

FIGURE 4.6: PROJECTED TOTAL ANNUAL DEMAND FOR RENTAL APARTMENTS, CAMAS (2022-2027)



SOURCE: Environics, U.S. Census Bureau, JOHNSON ECONOMICS

Though turnover represents demand for which there already is matching supply, these transactions tend to benefit the absorption of new units in the market, as existing renters "trade up" into newer units with less wear and more up-to-date features. Based on Clark County taxlot data, analyzed in GIS, the average age of existing apartment projects with at least five units in Camas is 35 years, suggesting more up-to-date properties should be able to offer a large competitive contrast. Moreover, the data indicates that the average size of these projects is 19 units. Projects of this scale rarely offer any community amenities to speak of.

V. CONCLUSIONS

ALTERNATE USES

While the subject site is generally suitable for either of the proposed uses, the prospective industrial business park development faces some disadvantages while a mixed-use development generally enjoys advantages for feasibility. These are mainly related to market forces, demand, and the topography of the site, and compatibility with surrounding uses:

- **Topography:** The sloping topography of the site might present a challenge for industrial users who prefer flat land. The preparation and grading of this land must not be cost prohibitive, because typically industrial users pay the least of the major uses for buildable land (i.e. excessive land development costs can render a site infeasible for industrial use). Multi-family developments are typically feasible on more uneven topography due to the ability to locate multiple smaller buildings and parking areas at different elevations. **Higher-value residential and/or commercial developments can also typically support higher cost for land preparation than industrial uses.**

- **Compatibility:** Housing is a classic compatible use next to a golf course, and this development would benefit from being near the clubhouse and driving range. The established neighborhoods to the east around the golf course demonstrate that this is a desirable location for residents, offering excellent access to nature, views, and livability amenities. The site is compatible for a range of small commercial users including convenience retail, small dining establishments and small office users. These uses can benefit from a location between industrial parks to the west, residential neighborhoods to the east, and traffic to and from the golf course.

  Some industrial and flex-space users are likely to be incompatible with the existing golf course use to the north edge of the site. These include businesses that create negative externalities such as noise, smoke or other fumes, excessive industrial yard machinery or storage, or heavy truck traffic. Business Park office development may be less likely to face these issues.

- **Market Conditions:** The Camas and East Vancouver submarket has seen healthy growth of industrial and office park users and new jobs since 2010. But according to data from CoStar Analytics, the strength of the local office market has fluctuated over time. While rent levels have risen steadily, vacancy has at times exceeded the 10% threshold sought in a healthy market. Recently, the pandemic has greatly increased professional office vacancy as many workers switched to working from home, and may not return.

  Currently, there are thousands of vacant square feet of space available at the Camas Meadows Corporate Center across the street from the subject site. As discussed more below, there is also estimated to be an oversupply of industrial and business park land to accommodate new development. For these reasons, **Johnson Economics does not estimate that there is currently a shortage or even tight supply of industrial, business park or office space in the Camas area** for the foreseeable future.

  The subject site may be a good location for small commercial businesses, providing good access and visibility, with a built-in local customer base. The greatest concentrations of commercial shopping and service are all located more than a mile from this area. Demand for these businesses will continue to grow as Camas experiences strong residential and employment growth. The Camas 2035 plan forecasts strong growth in commercial jobs over coming decades, and significantly outnumbering industrial jobs.

  Since 2000, Camas has grown by 4,000 households, or 89% growth. This translates to robust annual growth of 3.2%, in comparison to 1.4% growth in Washington State, and 0.8% in the United States. The community is forecasted to continue to add an average of roughly 200 households each year over the next five years. The housing supply for both owner and rental units must continue to increase to meet the need of these new residents.

Camas is a strong residential development market, with median sale price of homes approaching $500,000 and 30% higher than the prior peak in 2007. Annual home sales have increased from 415 to 770 between 2007 and 2021, and housing units permitted rose from 130 to 650 per year. This pace already exceeds the forecasted growth rate of the Camas 2035 plan.

- **Job Capacity:** The Camas 2035, using Clark County assumptions assumes that industrial land will develop at an average of 9 jobs per acre. The amount of employment at any one LI/BP development will vary. Office space in a business park is likely to supply jobs at a higher density than a warehouse. However, it should be noted that if a greater job density is assumed, then the forecast of total needed industrial acres over 20 years should also be lower (i.e. more jobs would be accommodated on less land.) If that is the case, then this would result in an even higher surplus of industrial land in the inventory. The impact of converting a small amount of it to a different use would be even less.

  Under the alternative mixed-use scenario for the site, the commercial portion is assumed to accommodate an average of 20 jobs per acre, indicating that the transition from industrial to commercial zoning will still allow for employment growth at the subject site.

INDUSTRIAL AND COMMERCIAL LAND SUPPLY

The Camas 2035 comparison of 20-year land need from job and household growth, with the current buildable lands, found a surplus of all the major categories of land in Camas (Figure 3.1, reproduced below). If the lands build out as projected, there will remain a surplus of 127 commercial acres, and 167 industrial acres. **These adopted figures do not present a compelling reason to protect a small amount of either of these categories of land from conversion**, all else being equal.

FIGURE 3.1: ESTIMATED LAND SUPPLY AND DEMAND
CITY OF CAMAS COMPREHENSIVE PLAN (2015 – 2035)

Land Use Category	Density	Demand (2035)			Total Land Supply / Capacity		Surplus Supply / Capacity	
		Jobs	Units	Acres	Net Acres (CP)[1]	Capacity (jobs/units)	Net Acres (CP)	Capacity (jobs/units)
Commercial	20 jobs/ac	6,744		337	464	9,280	127	2,536
Industrial	9 jobs/ac	4,438		493	660	5,940	167	1,502
	Total:	***11,182***		***830***	***1,124***	***15,220***	***294***	***4,038***
Residential	6 units/ac		3,868	645	876	5,256	231	1,388

[1] Acreage based on VBLM, but further refined by City. Finding of more net acres than in VBLM.

Source: Camas 2035, Table 1-1; Clark County Vacant Buildable Lands Model (2015)

The updated 2020 VBLM (yet to be adopted) indicates that the supply of buildable residential land has diminished much faster than the supply of commercial or industrial land. The report provides estimated development pace from 2016-2020. At this pace, the remaining acreage represents the following land supply by category:

- Over 50 years of Commercial Land (6 acres/year)
- Over 400 years of Industrial Land (1.6 acres/year)

- 8 years of Residential Land (59.6 acres/year)

INDUSTRIAL VS. COMMERCIAL LAND DEMAND

The Camas 2035 projects a 20-year growth of 11,182 jobs. A majority of these (60%) are forecasted to be jobs that take place in a commercial environment, and 40% in an industrial environment (Figure 3.1). Additional analysis by employment sector using state ESD forecasts supports the conclusion that, despite robust industrial job growth, a majority of new employment will be commercial jobs. **This finding is supportive of conversion of a modest amount of industrial land to commercial land on the border of the Grass Valley LI/BP area, without significantly impairing the ability to meet future industrial demand.**

RESIDENTIAL LAND DEMAND

The Camas 2035 plan likewise finds a surplus of residential lands over the planning period. Over the coming five years, Johnson Economics projects an increase of roughly 960 households within Camas, or 190 per year. This represents annual growth of 2.2%, which we consider a conservative estimate. **The demand analysis prepared by strongly supports the need for additional housing options of all types over the coming decades.**

The subject site is an appropriate location for housing as part of a mixed-use development based on physical, location and market factors.

Staff Report

October 3, 2022, Council Workshop Meeting

General Sewer Plan Update
Presenter: Rob Charles, Utilities Manager
Time Estimate: 15 minutes

Phone	Email
360.817.7003	rcharles@cityofcamas.us

BACKGROUND: The General Sewer Plan (GSP) update provides the City with a plan to install or replace infrastructure to meet both growth (capacity) and repair and replacement needs of the City over a 20-year period. The plan also provides a cost for the upgrades as well as a financial plan for funding the projects.

SUMMARY: The Department of Ecology requires that cities review their GSP for consistency and update it to reflect the needs of city's growth. The attached plan meets the needs of Ecology and will provide a plan for maintaining existing infrastructure as well as providing new infrastructure to meet growth projections.

EQUITY CONSIDERATIONS:

What are the desired results and outcomes for this agenda item?

Approval of the GSP so the City can plan accordingly for future sewer infrastructure needs.

What's the data? What does the data tell us?

Based on the City's anticipated growth, additional sewer infrastructure will be required.

How have communities been engaged? Are there opportunities to expand engagement?

A State Environmental Policy Act has been completed and will be published in the paper of record for public comments.

Who will benefit from, or be burdened by this agenda item?

Users of the sewer system and the City as a whole will benefit from the GSP.

What are the strategies to mitigate any unintended consequences?

N/A

Does this agenda item have a differential impact on underserved populations, people living with disabilities, and/or communities of color? Please provide available data to illustrate this impact.

No.

Will this agenda item improve ADA accessibilities for people with disabilities?

N/A

What potential hurdles exists in implementing this proposal (include both operational and political)?

Costs identified in the plan will need to be funded through rate and System Development Charge increases over time.

How will you ensure accountabilities, communicate, and evaluate results?

Budget requests will reflect plan components and funding.

How does this item support a comprehensive plan goal, policy or other adopted resolution?

The GSP is in essence the Capital Facilities Plan for the Sewer System, which is a component of the City's Comprehensive Plan.

BUDGET IMPACT: This specific item has no direct budget impacts. However, a preliminary rate analysis completed by FCS Group as part of the GSP process identifies the need for rate increases to fully fund the plan.

RECOMMENDATION: This item is for Council's information only. Staff recommends that Council adopt the General Sewer Plan as presented at the November 21st Council meeting. This plan will be part of the Capital Facilities Plan element of the Comprehensive Plan which will also be adopted that evening.

General Sewer Plan Update

Presentation to City Council

City of Camas // October 2022

Agenda

- Elements addressed in General Sewer Plan(GSP).
- Projected collection system flows.
- City’s existing wastewater system.
- Inflow and infiltration.
- System analysis and recommended projects.
- Capital Improvement Plan.
- Financial analysis.

Elements addressed in General Sewer Plan

The GSP provides a 20 year plan for the city to install or replace infrastructure to meet growth and repair and replacement needs of the city and is fiscally responsible. The plan is approved by Department of Ecology and the City of Camas.

- The evaluation of system capacity to address both existing deficiencies and potential development.
- Implementation of recommended system improvements by priority and funding which maintains affordable rates for the system users.

Projected collection system flows

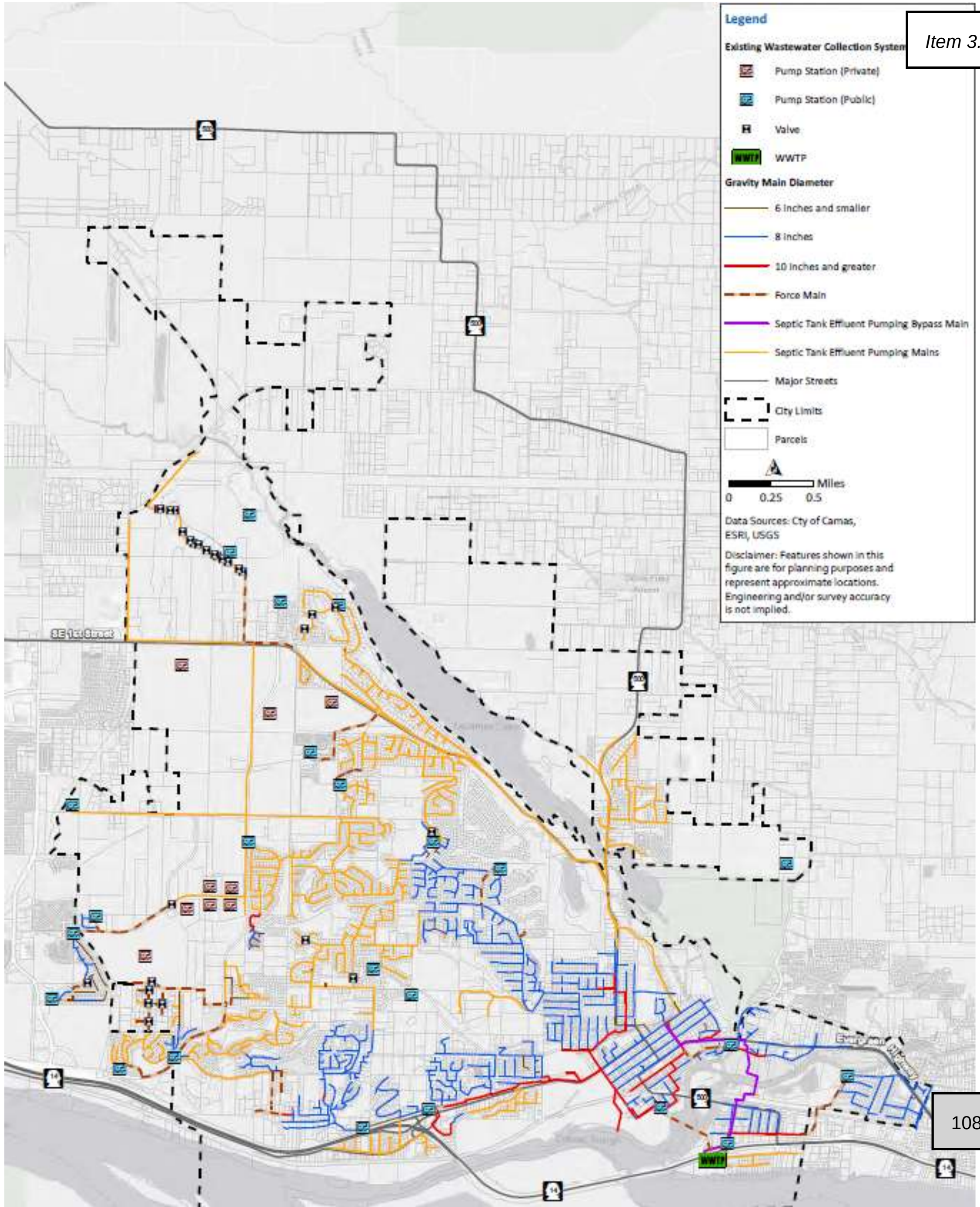
- Based on City's 2035 Comprehensive Plan. Wet weather flows are high in the city due to the influence of groundwater which enters sewer lines underground or stormwater which can enter through non-permitted connections to sewer lines.

Planning Horizon	Average Dry Weather Flow (mgd)	Peak Wet Weather Flow (mgd)
2018	0.80	5.45
2035	1.63	13.33
Buildout	2.63	14.86

// City's existing sewer system

- Conventional system
  - 44.7 miles of gravity main
  - 29 lift stations
  - 7.2 miles of force main
- Septic tank effluent system
  - 49.8 miles of sewer main

  5000+ STEP Tanks maintained by the city



Item 3.

City's Wastewater Treatment Facility (WWTF)

The city has greatly reduced infiltration and inflow!

Parameter	EPA Criteria for Excessive I/I (gpcd)	I/I Value for Camas in 2014 (gpcd)	Current I/I Value for Camas (gpcd)
EPA Excessive Infiltration Criteria	120	80	46
EPA Excessive Inflow Criteria	275	348	176

gpcd - gallons per capita per day.

Recommended Project Improvements Short term (2022-2031) and Long Term (2032-2041)

Pipelines

- Short Term - $5.517M
- Long Term - $568k

Pump Stations (PS)

- Short Term - $3.787M
- Long Term - $12.813M

Gravity and STEP System

- Short Term - $821k
- Long Term - $816k

Repair and Replacement (Waste Water Treatment Plant (WWTP), PS, Sewer mains, STEP Tanks)

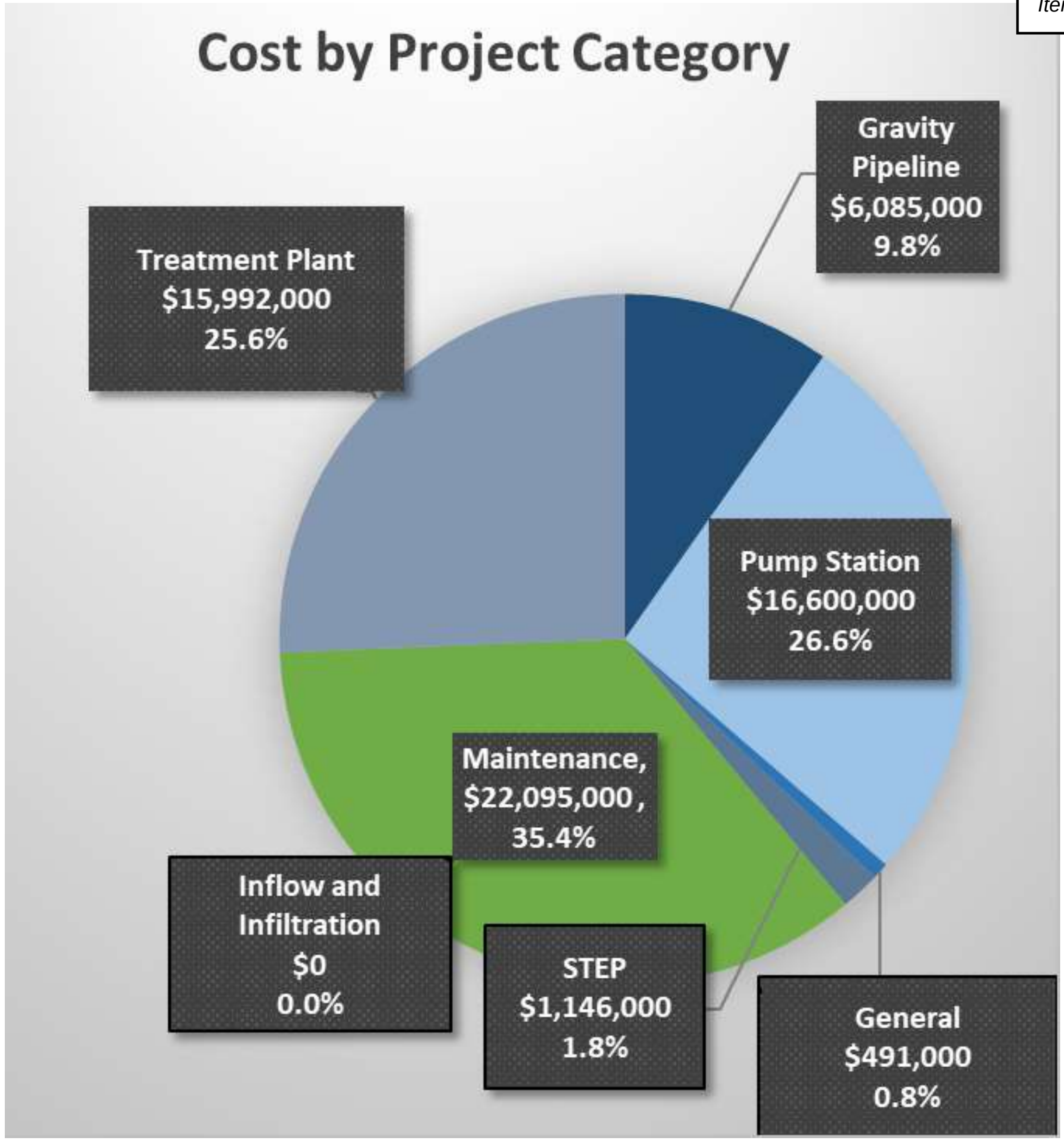
- Short Term - $14.595M
- Long Term - $7.5M

WWTP

- Short Term - $15.254M
- Long Term - $738K

Capital Improvement Plan

Planning Period	Total Cost	Annual Cost
Short-term (2022-2031)	$40.0 M	$4.0 M
Long-term (2032-2041)	$22.4 M	$2.2 M



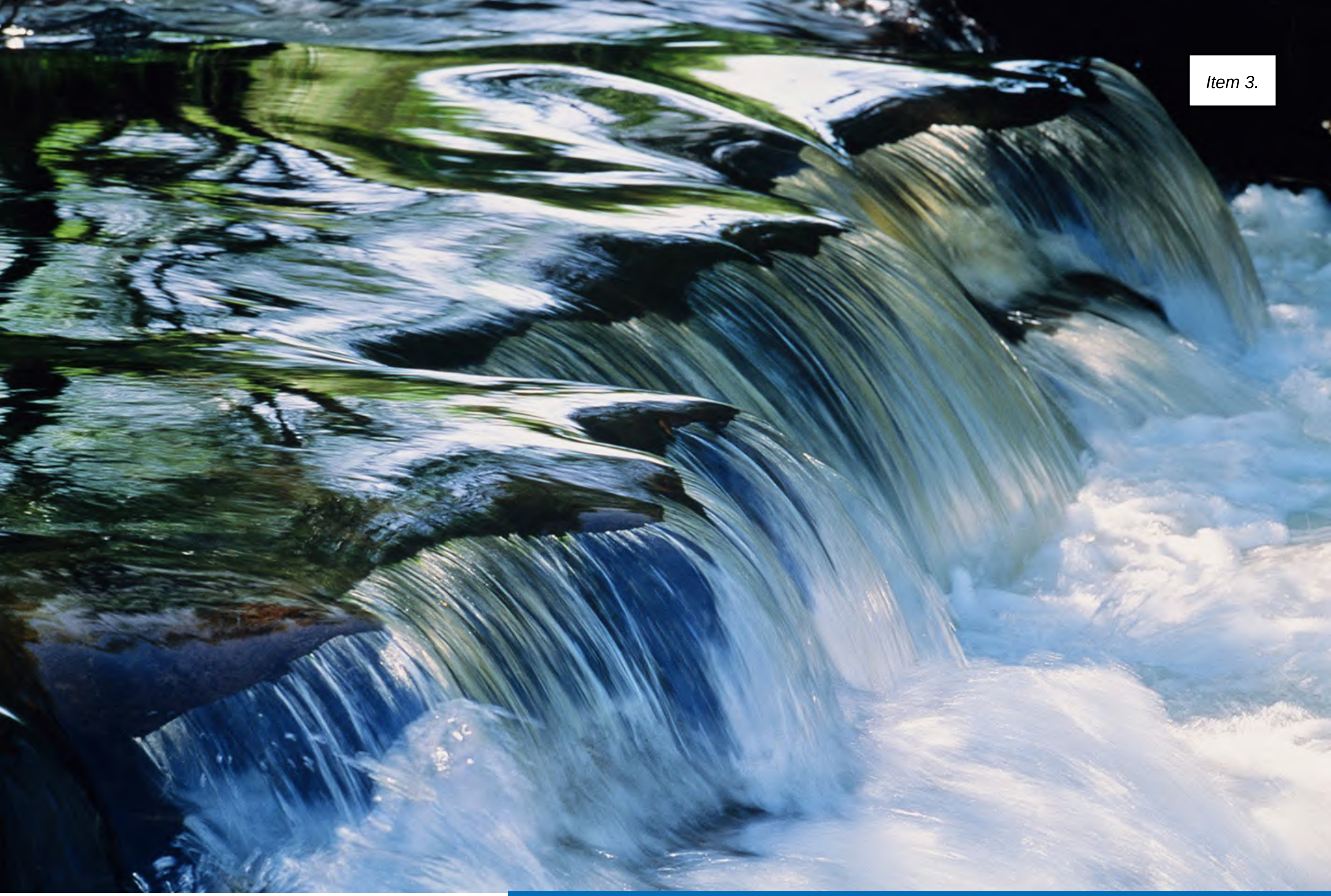
Financial analysis

- Rates increases needed to provide sufficient revenue:
  - *Recommended rate increase:
    - 3.3% annual increase in 2022 and 2023.
    - 1.75% annual increase in 2024 through 2026.
  - State affordability index defined as 2% of median household income or more.
    - Rates projected to be 0.53 – 0.59% of median household income.

*Rates are currently being reviewed by FCS Group and will be presented to council at a later date.

- Adoption of the GSP will be at the Nov. 21st Council meeting as part of the Capital Facilities Plan element of the Comprehensive Plan.

Questions?



City of Camas

GENERAL SEWER PLAN

DRAFT | June 2022

City of Camas

GENERAL SEWER PLAN

DRAFT | June 2022

This document is released for the purpose of information exchange review and planning only under the authority of Joshua R. Miner, June 23, 2022, State of Washington PE No. 22015138.

Contents

Appendices

Tables

Figures

Abbreviations

°F	degrees Fahrenheit
AACE	American Associate of Cost Estimators
AAF	average annual flow
AB	aeration basin
AC	alternating current
ACH	changes per hour
ADWF	Average Dry Weather Flow
AKART	all known, available and reasonable methods of prevention, control and treatment
Anx	Anoxic Zone
aSRTs	aerobic solids retention times
ATS	automatic transfer switch
BOD	biochemical oxygen demand
BOD_5	5-day biochemical oxygen demand
CARA	Critical Aquifer Recharge Area
Carollo	Carollo Engineers, Inc.
CCTV	closed-circuit television
CFD	computational fluid dynamics
CFM	cubic feet per minute
CFR	Code of Federal Regulations
cfs	cubic feet per second
CIP	Capital Improvement Plan
City	City of Camas
CMC	Camas Code of Ordinances / Municipal Code
CMMS	Computerized Maintenance Management System
CWA	Clean Water Alliance
d	depth
D	diameter
d/D	depth versus diameter
DMR	discharge monitoring report
DMZ	demilitarized zone
DNS	determination of non-significance
DO	dissolved oxygen
DOE	Department of Ecology
DWF	dry weather flow
E&IC	electrical instrumentation and control
EA	Environmental Assessment
Ecology	Washington State Department of Ecology

ENR	Engineering News Report
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FOG	fats, oil and grease
FONSI	finding of no significant impact
ft	feet
ft/sec	feet per second
ft^3	cubic feet
gal	gallon
GIS	geographic information system
GMA	Washington Growth Management Act
gpad	gallons per acre per day
gpcd	gallons per capita day
gpd	gallons per day
gpd/sq ft	gallons per day per square foot
gpm	gallons per minute
GSP	general sewer plan
GWI	groundwater infiltration
HDPE	high-density polyethylene
HGL	Hydraulic Grade Line
HMI	human-machine interface
hp	horsepower
hr	hour
I/I	Inflow and Infiltration
IDWF	Influent Dry Weather Flow
in	inch(es)
lbs/day	pounds per day
LEL	Lower Explosive Limit
LF	linear feet
LOS	level of service
LS	lift station(s)
MG	million gallons
$Mg(OH)_2$	Magnesium Hydroxide
mg/L	milligrams per liter
mgd	million gallons per day
MH	manhole
mi	mile
mL	milliliter

mL/g	milliliters per gram
MLSS	mixed liquor suspended solids
mm	millimeter
MMF	maximum monthly flow
MS4	Municipal Separate Storm Sewer System
n	Manning's Coefficient
N/A	Not applicable
NASSCO	National Association of Sewer Service Companies
NEPA	National Environmental Policy Act
NH4	ammonia
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	National Resources Conservation Service
O&M	operation and maintenance
Orange Book	Ecology's Criteria for Sewage Works Design book
Ox	Aerobic Zone
PC	primary clarifier
PCB	polychlorinated biphenyl
PDCs	power distribution centers
PDF	peak day flow/load
PDX	Portland Airport
Penn Valley	Penn Valley Pump Company, Inc.
PHD	peak hour demand
PHDF	peak hour demand flow
PHF	peak hour flow
Plan	City of Camas General Sewer Plan
PLC	programmable logic controller
ppcd	pounds per capita day
ppd	pounds per day
ppm	parts per million
PS	Pump Station???
psi	pounds per square inch
PVC	polyvinyl chloride
PWWF	peak wet weather flow
QA/QC	quality assurance and quality control
RAS	Return Activated Sludge
RCW	Revised Code of Washington
RDI/I	rainfall dependent infiltration and inflow
RIOs	remote input/output

R&R	repair and replacement
SAx	Anaerobic Selector Zone
SC	secondary clarifier
SCADA	supervisory control and data acquisition
SEPA	State Environmental Policy Act
SPA	state point analysis
SR	State Route
SSO	sanitary sewer overflow
STE	septic tank effluent
STEF	septic tank effluent filter
STEG	septic tank effluent gravity
STEP	septic tank effluent pump
SU	standard units
SVI	sludge volume index
SWCAA	Southwest Clean Air Agency
SWPPP	stormwater pollution prevention plan
TCLP	toxic characteristic leachate procedure
TM	technical memorandum
TP	treatment plant
TSS	Total Suspended Solids
UGA	Urban Growth Area
UGB	Urban Growth Boundary
UV	ultraviolet
VCP	vitrified clay pipe
VFD	variable frequency drive
WAC	Washington Administrative Code
WAS	Waste Activated Sludge
WRF	water reclamation facility
WSE	water surface elevations
WTP	water treatment plant
WWTF	wastewater treatment facility
WWTFO	Washington Wastewater Treatment Facility Operator

EXECUTIVE SUMMARY

ES.1 Introduction

The City of Camas (City) is located in Clark County, Washington near the border of Washington and Oregon along the Columbia River near Vancouver, Washington. The City owns and operates most of the sewer collection system within the City limits and its urban growth boundary (UGB). The collection system is a combination of gravity sewers, pump stations, force mains, and septic tank effluent pump (STEP) systems. Wastewater is collected and treated by the City at the Camas Wastewater Treatment Plant and then discharged to the Columbia River.

The purpose of the City's General Sewer Plan (Plan) is to develop a clear and logical path to manage the collection system over the next 20 years. The Plan results from an evaluation of the sanitary sewer system which identified deficiencies and concerns that must be addressed to provide service to existing users, as well as improvements needed to accommodate growth. Key elements addressed in the Plan include:

- The need and timing of the replacement of older, deteriorating sanitary sewer facilities within large, neighborhood-size areas within the City.
- The evaluation of system capacity to address both existing deficiencies and potential development.
- The identification of sanitary sewer lift stations and force mains requiring removal, rehabilitation, and replacement.
- The City's Infiltration and Inflow (I/I) program to evaluate options and needs for I/I reduction.
- Implementation of recommended improvements by priority which maintains affordable rates for the system users.

ES.1.1 Sewer Service Area

A map of the sewer service area is presented in Figure ES.1.

ES.2 Policies

The City is responsible for managing and operating its wastewater system in accordance with all local, state, and federal regulations. To best manage the wastewater system and comply with regulations, the City has adopted wastewater system policies and criteria. These policies guide the development and financing of the infrastructure required to provide wastewater service and document the City's commitments to current wastewater system customers as well as those considering service from the City. The following policies and criteria are summarized in Chapter 2 - Policies:

- Environmental Stewardship.
- Design Criteria and Standards.
- Financial Policies.
- Regulatory Requirements.

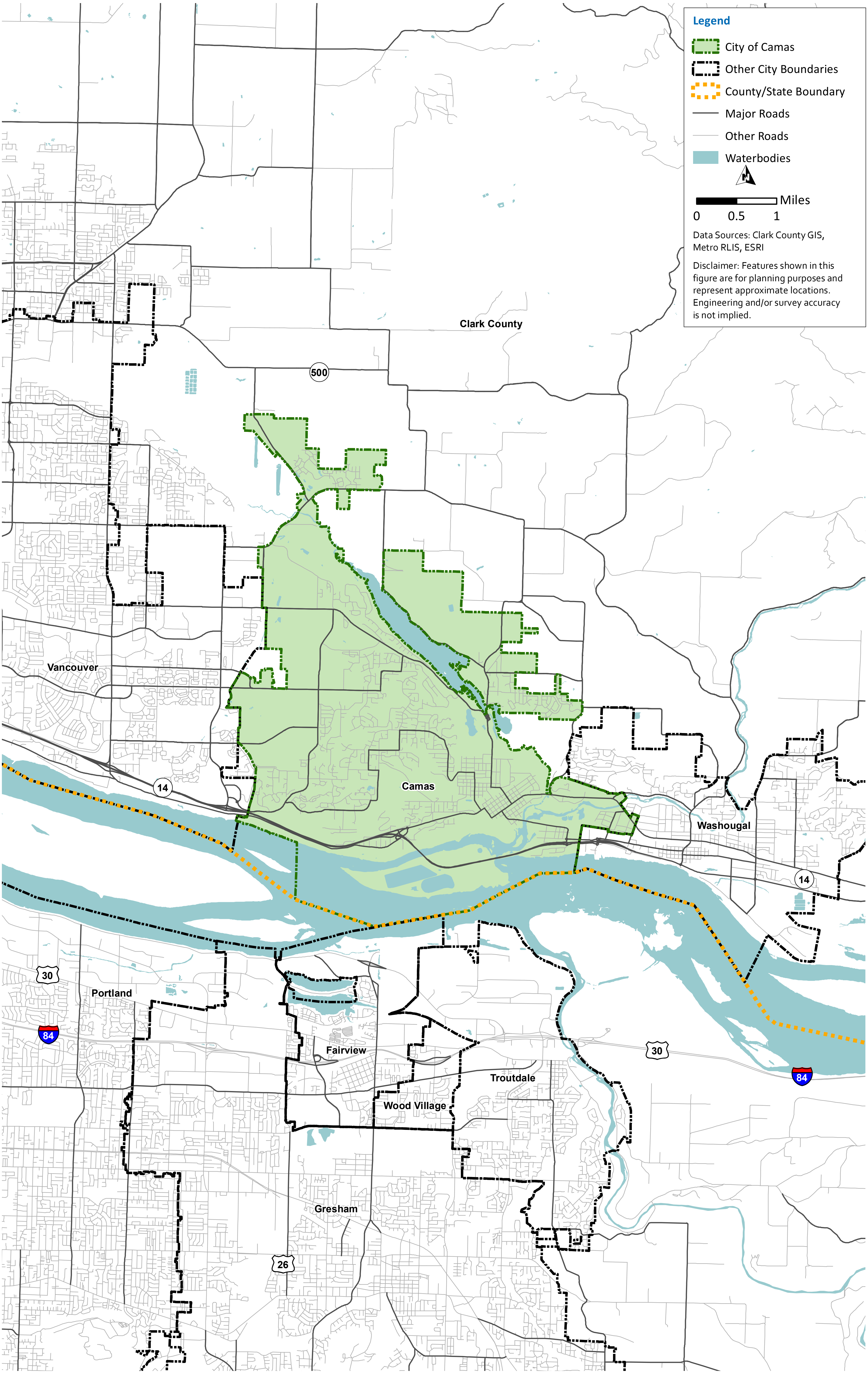


Figure ES.1 Vicinity Map

ES.3 Basis of Planning

Chapter 3 of the Plan presents flow projections for the collection system and wastewater treatment facility (WWTF) based on demographic growth projections from the *2035 Comprehensive Plan*. Slightly different methodologies are used to project wastewater flows in the collection system and WWTF due to the requirements of the analyses and availability of data. Two major factors drive these differences. First, the collection system analysis considered flow monitoring data collected during a four-month period in the winter of 2018 and 2019, while the WWTF analysis uses historical influent data from 2015 through 2018. Second, the WWTF was assessed using flows projected for 2035, while collection system flows consider both 2035 and buildout of the service area. Collection system piping is typically sized using the buildout period projections since these pipes have a 75-year service life.

ES.3.1 Collection System Flow Projections

The collection system flow projections were developed for use in the City's calibrated hydraulic model of the sewer system. The modeled system corresponds with the study area of the 2019 flow monitoring program, which focused on the lower basins in the collection system closest to the WWTF. The data collected during the flow monitoring program was used along with population growth projections, land use development projections, and wastewater flow factors to develop the flow projections presented in Table ES.1.

Table ES.1 Hydraulic Model Flow Projections Summary

Planning Horizon	ADWF (mgd)	PWWF (mgd)	Peaking Factor (PWWF : ADWF)
2018	0.80	5.45	6.8
2035	1.63	13.33	8.2
Buildout	2.63	14.86	5.7

Notes:
Abbreviations: ADWF - average dry-weather flow; mgd - million gallons per day; PWWF - peak wet weather flow.

ES.3.2 WWTF Flow and Load Projections

The City's WWTF receives flows from the gravity collection system, septic tank effluent, and the septage receiving station. The sum of these flows is greater than the collection system flow projections because the analysis performed for this Plan only focused on the portion of the system included in the hydraulic model and did not include septic tank flows, which constitute up to 50 percent of the total influent flow. Thus, load and peak hour flow projections were developed independently for the WWTF based on measured influent flows and wastewater characteristics, typical septage and STEP system characteristics, and population growth projections. The City expects that half of additional plant flow from population growth within the service area will come from the gravity sewer system, while the other half of the additional flow will come from the STEP system. The influent flow projections developed for the WWTF are summarized in Table ES.2.

Table ES.2 Current and Projected WWTF Flows

Flow Parameter	2021 Flow (mgd)	2035 Flow (mgd)
ADWF	2.2	3.4
AAF	2.8	4.0
MMF	4.8	6.2
PDF	8.4	10.8
PHF	10.0	13.5

Notes:
Abbreviations: AAF - average annual flow; MMF - maximum monthly flow; PDF - peak day flow/load; PHF - peak hour flow.

Wastewater loading data which are related to effluent limitations contained in the City's WWTF National Pollution Discharge Elimination System (NPDES) permit were also projected to evaluate treatment capacity for future conditions. Historical values for 5-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), and ammonia (NH_3) and projections to 2035 are detailed in Table ES.3.

Table ES.3 Current and Projected WWTF Loads

Load Parameter	2021 Load (ppd)	2035 Load (ppd)
Sewered Population(1)	18,900	36,000
BOD_5 (ppd)		
Average Annual	2,400	6,000
Max Month	3,300	8,200
Max Week	4,300	10,600
Peak Day	5,300	13,000
TSS (ppd)		
Average Annual	2,400	6,300
Max Month	3,300	10,500
Max Week	4,300	17,000
Peak Day	5,300	19,300
Ammonia (ppd)		
Average Annual	900	1,400
Max Month	1,100	2,000
Peak Day	1,800	4,300

Notes:
(1) Current sewered population is based on 2035 Comprehensive Plan.

ES.4 Existing System

Chapter 4 describes the sewer system within the City's service area, which is owned, maintained, and operated by the City. A map of the existing system is shown in Figure ES.2. The City's conventional system (modeled for this Plan) includes 236,200 linear feet of gravity mains, 29 lift stations, and 38,260 linear feet of force main, which convey nearly half of the total influent flow to the City's WWTF. The septic tank effluent systems convey the remainder of the total flow treated by the City's WWTF through 263,110 linear feet of dedicated sewer mains. The septic tanks provide preliminary wastewater treatment, solids settling, and some digestion such that the effluent is not as strong as raw sewage collected in the conventional system. Each septic tank in the City's service area is pumped out on a five-year cycle and the solids are trucked to the WWTF for treatment.

The City's WWTF is located along the Columbia River in the southeastern portion of its sewer service area. The WWTF was originally constructed in 1972 and has had several modifications since that time to increase capacity and improve treatment capabilities to continue to meet all effluent permit requirements. The City's NPDES effluent discharge limitations, prohibitions, and requirements are similar to other municipal facilities with standard 30/30 monthly TSS and BOD concentration limits with a mandatory 85 percent reduction in each. However, the WWTF has ammonia limits of 20 milligrams per liter (mg/L) (NH_3 as N) in the summer and 7 mg/L (NH_3 as N) in the winter. An aerial view of the WWTF with each unit process and building identified is shown in Figure ES.3.

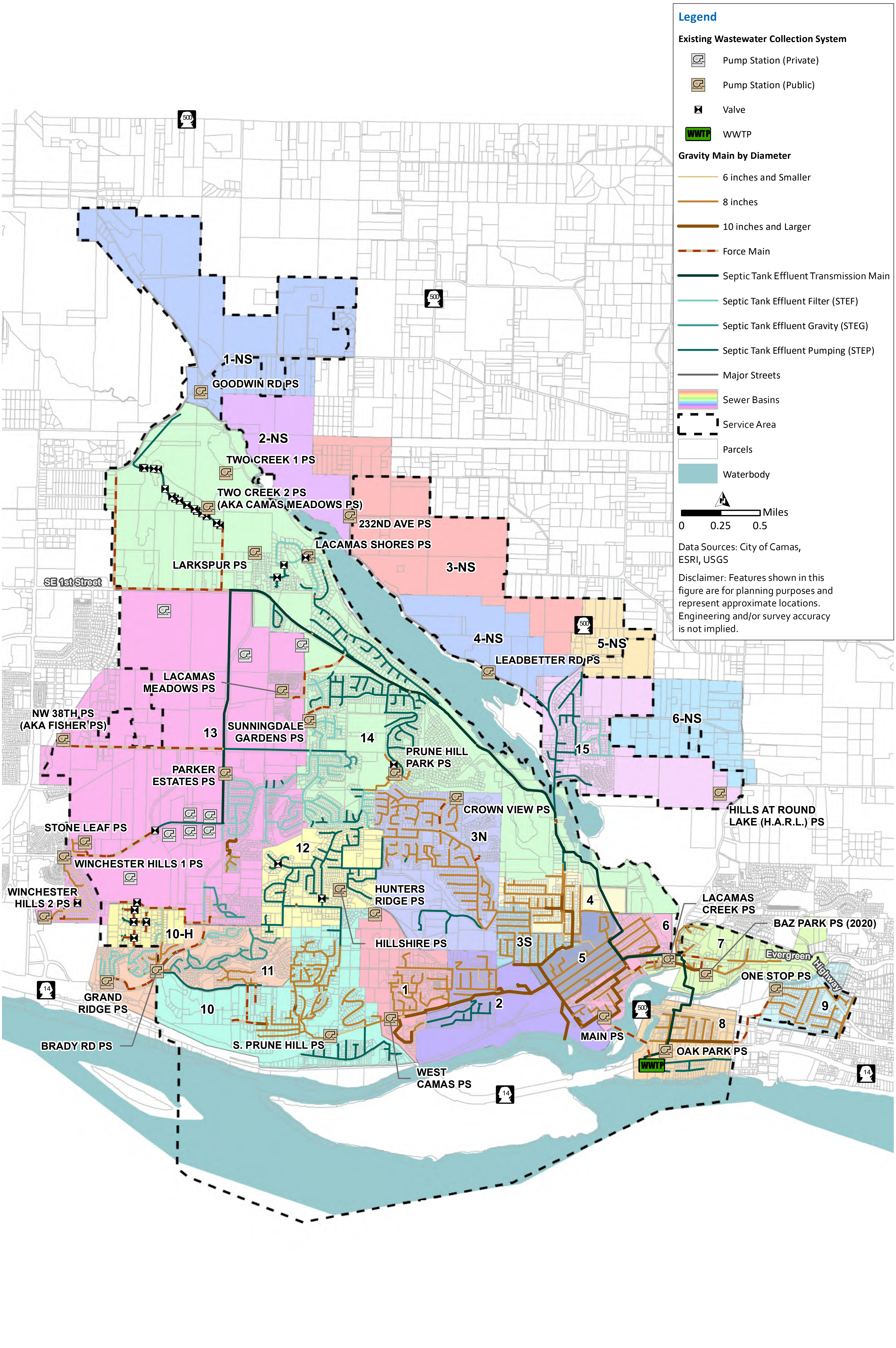


Figure ES.2 Existing Wastewater Collection System

Figure ES.3 WWTF Aerial Image with Site Plan

ES.5 Infiltration and Inflow Program

Chapter 5 of this plan summarizes the City's efforts to reduce I/I from 2016 through 2020 and the quantifiable, positive improvement that has been accomplished in reducing I/I. Infiltration and inflow consist of two components which may combine or act independently to increase flow volume and peak flows in the sewer system. If too much I/I enters the sewer system such that the sewer system is operating at or above its capacity, sanitary sewer overflows (SSO) could occur. More dilute wastewater can also be more difficult to treat under percent removal NPDES permits such as those held by the City.

In 2016, the City commissioned an evaluation of the collection system to document existing infiltration and inflow as a condition of their new stormwater permit. The results of this study showed that there was excessive inflow compared to the EPA's guidelines. Since 2016, the City initiated an I/I reduction program and has completed improvement projects each year, totaling well over $1 million. A follow up study completed in 2020 showed significant improvements in I/I and improved WWTF performance. Table ES.4 summarizes the improvements in per capita I/I observed in the City's collection system. The City is continuing to invest in the collection system to further reduce I/I through a pipeline repair and replacement program along with improvements to two key lift stations: Crown View pump station and Lacamas Creek pump station.

Table ES.4 Per Capita I/I Compared to EPA Criteria

Parameter	EPA Criteria for Excessive I/I (gpcd)	I/I Value for Camas in 2014 (gpcd)	Current I/I Value for Camas (gpcd)
EPA Excessive Infiltration Criteria	120	80	46
EPA Excessive Inflow Criteria	275	348	176

Notes:
Abbreviations: gpcd - gallons per capita day.

ES.6 System Analysis

Chapter 6 describes the hydraulic modeling analysis conducted for gravity pipes and pump stations in the modeled portion of the City's collection system. The modeled collection system is primarily large gravity sewers which represent a skeletonized version of the system that does not include the septic tank effluent infrastructure. The analysis identified capacity deficiencies associated with current and projected future use and recommends improvements to alleviate any identified concerns. The collection system was evaluated applying three planning scenarios:

- **Existing:** Matching existing conditions.
- **2035:** Incorporating flows related to growth through 2035 as identified in the City's comprehensive plan.
- **Build-Out:** Development of the full service area including urban growth boundary.

Performance and design criteria for the conveyance system are outlined below:

- **Performance Criteria:** During PWWF for the design storm, water levels should not exceed a maximum depth to diameter flow ratio (d/D) of 1.2 for build-out conditions, and a d/D of 1.0 for existing conditions. No surcharging (d/D>1.0) is allowed at manholes where the distance between crown of pipe and manhole rim is less than three feet.
- **Design Criteria:** New sewers shall be designed to flow at a maximum d/D of 1.0 at peak flow rates for both existing and build-out conditions.

The City's lift stations should have sufficient firm capacity to pump the PWWF during the design storm with the largest pump out of service. Other pump station and force main design criteria are presented in Chapter 2 of the Plan.

ES.6.1 Gravity Collection System Evaluation

For each planning scenario, the associated PWWF was routed through the hydraulic model. The peak hydraulic grade line in manholes and gravity pipelines was compared to the established performance criteria. Under existing conditions there are seven potential problem areas where the capacity is deficient to convey the PWWF. Two additional deficiency areas were identified in the build-out scenario.

ES.6.2 Lift Station Evaluation

The City's hydraulic model includes five out of the seven lift stations located in the gravity collection system. The estimated current and future PWWFs were compared to the five lift station firm capacities in the hydraulic model. For the two lift stations not in the model, firm capacity was compared to projected influent flows. Four of the seven lift stations did not meet the firm capacity criteria under current conditions and the deficiencies were exacerbated under build-out conditions.

ES.6.3 Recommended Improvements

When an increase in capacity is required, existing sewers can be upsized to a larger diameter pipe, or parallel or relief sewers can be constructed. Table ES.5 summarizes the recommended pipe capacity improvement project details.

It is recommended that the Main, South Prune Hill, West Camas, and Crown View Plaza PSs all be upgraded to provide pump redundancy under existing PWWF conditions. These stations do not meet the required firm capacity, based on the City's performance criteria. Table ES.6 summarizes the recommended lift station improvement project details.

Table ES.5 Recommended Pipe Capacity Improvements Projects

Project ID	Improvement Type	Location	Existing Size (inch)	Proposed Size (inch)	Length (feet)	Phase
P-1	Gravity	NW Fargo Street between NW 23rd and NW 19th Avenue	8	12	1,007	Short-term
P-2	Gravity	Division Street between NW 18th and NW 11th Avenue	8	12	2,043	Short-term
P-3	Gravity	NW 6th Place, just upstream of South Prune Hills PS	8 10	12 12	188 616	Short-term
P-4	Gravity	NW 6th Place between South Prune Hills PS and West Camas PS	10	12	588	Short-term
P-5	Gravity	NW 6th Avenue downstream of West Camas PS and through Forest Home Park	12 12	15 18	311 1,340	Short-term
P-6	Gravity	NW 6th Avenue between NW 7th Avenue and SE Adams Street	12 8	18 21	817 401	Short-term
P-7	Gravity	NE and SE Adams Street between SE 3rd Avenue and NW 6th Avenue	21 24	24 27	773 925	Short-term
P-8	Gravity	NW 18th Loop	8	12	609	Long-term
P-9	Gravity	NE 15th Avenue between NE Garfield Street and NE Franklin Street	8	18	256	Long-term

Table ES.6 Recommended Lift Station Improvement Projects

Project ID	Improvement Type	Location	Description	Phase
PS-1	Gravity	South Prune Hills	Add pump capable of pumping 664 gpm.	Existing
PS-2	Gravity	West Camas	Add pump capable of pumping 723 gpm.	Existing
PS-3	Gravity	Crown View Hill	Add pump capable of pumping 382 gpm.	Existing
PS-4	Gravity	Main	Add pump capable of pumping 1,831 gpm.	Existing
PS-5	Gravity	Lacamas Shores, Sunningdale Gardens, Winchester Hills 2	Add flow monitors and pressure sensors to get a better understanding of what happens during peak flows and their capacity to aid in future capital improvement planning.	Existing

Notes:
Abbreviations: gpm - gallons per minute.

ES.7 Wastewater Treatment Facility

Chapter 7 summarizes efforts to identify shortfalls in WWTF capacity that will prevent the City from reliably treating and disposing of projected flow and loads in compliance with their NPDES permit at the end of the planning period (i.e., year 2035). To address the identified deficiencies, an alternatives analysis of the most viable improvement options was conducted, which resulted in the development of 14 projects to be incorporated into the Plan's capital improvement program (CIP). Table ES. 7 summarizes the recommended WWTF improvement project details.

Table ES.7 Recommended WWTF Improvement Projects

Project ID	Description	Improvement Type	Phase
TP-1	This project will improve the aeration basin's performance and increase treatment capacity.	Capacity	Short-Term
TP-2	This project includes the replacement of an aging secondary clarifier and replacement of RAS pumps for another secondary clarifier.	Capacity/Condition	Short-Term
TP-3	This project replaces two of the existing aeration blowers with larger high-speed turbo blowers to meet projected aeration demands	Capacity	Short-Term
TP-4	This project enhances plant hydraulics in several areas and includes the replacement of obsolete UV disinfection equipment.	Condition/ Capacity	Short-Term
TP-5	This project increases the effluent pump station's capacity, as required, to pump 100% of 2035's projected PHFs to the outfall in the Columbia River by replacing the existing effluent pumps with larger units.	Capacity	Short-Term
TP-6	This project replaces the existing grit-separation equipment, including hydrocyclones and grit classifiers, and increases the capacity of the odor control systems servicing the grit-handling area and dewatering building, which will extend the life and reduce maintenance of new installed equipment.	Condition	Short-Term
TP-7	This replaces the existing thickened primary sudge pumps with new progressive cavity pumps.	Condition	Long-Term
TP-8	This project replaces the existing digested sludge pumps with new double-disc piston-style pumps.	Condition	Long-Term
TP-9	This project rehabilitates the existing dewatering centrifuge and modifies the space to accommodate a standby unit for redundancy.	Condition	Short-Term
TP-10	This project repairs the existing plant drain pump station No. 1's structure and replaces its pumps.	Capacity/ Condition	Short-Term
TP-11	This project prepares a SCADA master plan that will provide the City with a roadmap to prioritize and implement planned system upgrades designed to address system deficiencies and enhance facility operation. This project includes an in-depth investigation of the existing SCADA control system for the City's WWTF and associated remote sites.	Planning	Short-Term

Project ID	Description	Improvement Type	Phase
TP-12	This project upgrades the existing SCADA system to provide redundancy and take advantage of modern features, including advanced data analysis, report generation, and secure remote accessibility	Network	Short-Term
TP-13	This project includes replaces existing Modicon Quantum hardware with new, standardized PLCs and RIO cabinets for all process areas at the WWTF.	Network	Short-Term
TP-14	This project plans for a future secondary treatment expansion to accommodate flows and loads outside the planning windows.	Planning	Long-Term

ES.8 Operations and Maintenance

Chapter 8 provides an overview of the City's wastewater utility organization, staffing, and operations and maintenance (O&M) program. City staff for the drinking water system and sewer system are combined. The staff works to provide effective and efficient service for utility rate payers through regular operation and maintenance activities on these systems as outlined in the program included in this Chapter.

ES.9 Capital Improvement Plan

The CIP presented in Chapter 9 includes projects needed to accommodate growth, repair and replace aged infrastructure, and attain level of service goals. The CIP is organized and prioritized in two separate project categories short-term (2022-2031) and long term (2032-2041) periods. Projects are grouped into pipeline, pump station, STEP, I/I, maintenance, treatment plant, and general types of infrastructure work. The CIP consists of the cost estimates and schedules for the recommended improvements. Table ES.8 summarizes the recommended CIP projects and estimated project costs. Approximately $41,000,000 of capital improvement projects have been identified for the short-term and an additional $21,435,00 in improvement projects have been identified for the long-term.

ES.10 Financial Analysis

Chapter 10 presents the financial analysis performed as part of this Plan to assess program needs that will allow the City's sewer utility to remain financially viable throughout the planning period. This financial viability analysis considered the historical financial conditions, current and identified future financial and policy obligations, O&M needs, and the financial impacts of the capital projects identified in this Plan. The results of this analysis indicate that rates must increase to provide revenue sufficient to cover all utility financial obligations, including the addition of new debt and partial cash funding of the capital program through 2031. In addition to the adopted annual increases of 3.30 percent in 2022 and 2023, annual 1.75 percent adjustments from 2024 through 2026 should provide for continued financial viability while maintaining generally affordable rates.

Table ES.8 Capital Improvement Plan Summary

City of Camas
General Sewer Plan
Capital Improvement Plan

Capital Improvement Plan Summary

Project		CIP Project Subtotal[1]	Total CIP Cost Estimate	CIP Phasing 2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Short-term (2022-2031)	Long-term (2032-2041)	Project Type: Growth	Repair & Replacement	Level of Service
Gravity Pipeline																		
P-01	NW Fargo St Upsize	354,000	644,000	-	644,000	-	-	-	-	-	-	-	-	644,000	-	0%	0%	100%
P-02	Division St Upsize	717,000	1,306,000	-	1,306,000	-	-	-	-	-	-	-	-	1,306,000	-	0%	0%	100%
P-03	NW 6th Pl West Upsize	282,000	514,000	-	514,000	-	-	-	-	-	-	-	-	514,000	-	0%	0%	100%
P-04	NW 6th Pl East Upsize	207,000	376,000	-	376,000	-	-	-	-	-	-	-	-	376,000	-	0%	0%	100%
P-05	NW 6th Ave West Upsize	454,000	825,000	-	825,000	-	-	-	-	-	-	-	-	825,000	-	0%	0%	100%
P-06	NW 6th Ave East Upsize	339,000	617,000	-	617,000	-	-	-	-	-	-	-	-	617,000	-	0%	0%	100%
P-07	Adams St Upsize	678,000	1,235,000	-	-	-	-	-	-	-	554,000	681,000	-	1,235,000	-	50%	0%	50%
P-08	NW 18th Loop Upsize	214,000	389,000	-	-	-	-	-	-	-	-	-	-	-	389,000	50%	0%	50%
P-09	NE 15th Ave Upsize	98,000	179,000	-	-	-	-	-	-	-	-	-	-	-	179,000	50%	0%	50%
	Gravity Subtotal		**6,085,000**	**-**	**4,282,000**	**-**	**-**	**-**	**-**	**-**	**554,000**	**681,000**	**-**	**5,517,000**	**568,000**			
Pump Station																		
PS-01	South Prune Hills Pump Station Improvements	280,000	510,000	-	510,000	-	-	-	-	-	-	-	-	510,000	-	0%	0%	100%
PS-02	West Camas Pump Station Improvements	280,000	510,000	-	-	-	-	510,000	-	-	-	-	-	510,000	-	50%	0%	50%
PS-03	Crown View Hill Pump Station Improvements	280,000	510,000	-	-	510,000	-	-	-	-	-	-	-	510,000	-	0%	0%	100%
PS-04	Main Pump Station Improvements	280,000	510,000	-	-	-	-	-	-	-	-	510,000	-	510,000	-	50%	0%	50%
PS-05	Upgrade Pump Station Telemetry	320,000	14,560,000	-	-	-	1,747,000	-	-	-	-	-	-	1,747,000	12,813,000	50%	0%	50%
	Pump Station Subtotal		**16,600,000**	**-**	**510,000**	**510,000**	**1,747,000**	**510,000**	**-**	**-**	**-**	**510,000**	**-**	**3,787,000**	**12,813,000**			
General																		
G-01	Gravity Collection System Model	270,000	491,000	-	-	-	-	-	-	-	-	-	-	-	491,000	75%	0%	25%
	General Subtotal		**491,000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**491,000**			
STEP																		
S-01	STEP Main Flows	126,000	229,000	-	-	-	-	-	-	-	-	-	-	-	229,000	75%	0%	25%
S-02	STEP Main Modeling	53,000	96,000	-	-	-	-	-	-	-	-	-	-	-	96,000	75%	0%	25%
S-03	STEP Main Condition Assessment/ Cleaning	451,000	821,000	-	-	821,000	-	-	-	-	-	-	-	821,000	-	0%	0%	100%
	STEP System Subtotal		**1,146,000**	**-**	**-**	**821,000**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**821,000**	**325,000**			
Inflow and Infiltration																		
I&I-01	Ongoing I&I Program	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50%	0%	50%
	Inflow and Infiltration Subtotal		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**			
Maintenance																		
M-01	WWTP R&R	2,000,000	2,000,000	2,000,000	-	-	-	-	-	-	-	-	-	2,000,000	-	0%	100%	0%
M-02	Pump Station R&R	12,000,000	12,000,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000	6,000,000	6,000,000	0%	100%	0%
M-03	Sewer Main R&R	3,000,000	3,000,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	1,500,000	1,500,000	0%	100%	0%
M-04	STEP Tank R&R	2,800,000	5,095,000	-	1,019,000	1,019,000	1,019,000	1,019,000	1,019,000	-	-	-	-	5,095,000	-	0%	100%	0%
	Maintenance Subtotal		**22,095,000**	**2,750,000**	**1,769,000**	**1,769,000**	**1,769,000**	**1,769,000**	**1,769,000**	**750,000**	**750,000**	**750,000**	**750,000**	**14,595,000**	**7,500,000**			
Treatment Plant																		
TP-01	Aeration Basin Improvements	189,223	376,000	-	-	-	-	-	-	376,000	-	-	-	376,000	-	80%	20%	0%
TP-02	Secondary Clarifier Improvements	2,785,535	5,539,000	-	-	-	-	-	-	-	5,539,000	-	-	5,539,000	-	50%	50%	0%
TP-03	Aeration Blower Replacement	936,557	1,862,000	-	-	-	-	-	-	-	-	1,862,000	-	1,862,000	-	100%	0%	0%
TP-04	Disinfection Building / Hydraulic Improvements	629,472	1,252,000	-	1,252,000	-	-	-	-	-	-	-	-	1,252,000	-	20%	80%	0%
TP-05	Effluent Pump Station Improvements	641,550	1,276,000	-	-	-	-	-	-	1,276,000	-	-	-	1,276,000	-	100%	0%	0%
TP-06	Grit Separation / Odor Control Improvements	507,998	1,010,000	-	-	-	1,010,000	-	-	-	-	-	-	1,010,000	-	0%	100%	0%
TP-07	TPS Pump Replacement	77,520	154,000	-	-	-	-	-	-	-	-	-	-	-	154,000	0%	100%	0%
TP-08	Sludge Recirculation Pump Replacement	256,077	509,000	-	-	-	-	-	-	-	-	-	-	-	509,000	0%	100%	0%
TP-09	Mechanical Dewatering Improvements	828,992	1,648,000	-	-	-	-	1,648,000	-	-	-	-	-	1,648,000	-	0%	100%	0%
TP-10	Plant Drain Pump Station No. 1 Improvements	260,057	517,000	-	517,000	-	-	-	-	-	-	-	-	517,000	-	50%	50%	0%
TP-11	SCADA Master Plan	208,964	209,000	-	-	209,000	-	-	-	-	-	-	-	209,000	-	50%	50%	0%
TP-12	SCADA Improvements	324,439	645,000	-	-	-	645,000	-	-	-	-	-	-	645,000	-	50%	50%	0%
TP-13	PLC & RIO Improvements	978,424	1,946,000	-	-	-	1,946,000	-	-	-	-	-	-	1,946,000	-	50%	50%	0%
TP-14	Secondary Treatment Expansion Planning	75,000	75,000			-	-	-	-	-	-	-	-	-	75,000	100%	0%	0%
	Treatment Plant Subtotal		**17,018,000**	**-**	**1,769,000**	**209,000**	**3,601,000**	**1,648,000**	**-**	**1,652,000**	**5,539,000**	**1,862,000**	**-**	**16,280,000**	**738,000**			
CIP Total			**63,435,000**	**2,750,000**	**8,330,000**	**3,309,000**	**7,117,000**	**3,927,000**	**1,769,000**	**2,402,000**	**6,843,000**	**3,803,000**	**750,000**	**41,000,000**	**22,435,000**	**17,495,700**	**30,920,800**	**15,018,500**
Annual Cost			3,172,000	2,750,000	8,330,000	3,309,000	7,117,000	3,927,000	1,769,000	2,402,000	6,843,000	3,803,000	750,000	4,100,000	2,244,000	875,000	1,546,000	751,000

Notes:

1. CIP Project Subtotal is project cost before contingency costs are added. CIP Project Cost = Estimated Construction Cost. Total CIP Project Cost = Estimated Construction Cost plus merkups for contingency, construction overhead (as applicable), engineering, and administration.
2. Part of existing City CIP Project.

Chapter 1

INTRODUCTION

1.1 Introduction

The purpose of the City of Camas's (City) General Sewer Plan (Plan) is to present policies and an assessment of the system to recommend facility improvements. The Plan is intended to provide a road map for accommodating growth and maintaining a high level of service for existing customers. The existing system is aging and will continue to require investment to maintain a high level of service.

The Plan results from an evaluation of the existing sanitary sewer system which provides the groundwork for recommendations to resolve existing deficiencies and concerns, as well as accommodating growth. This chapter presents the objectives of this Plan, and a brief overview of the City's wastewater collection system. A list of abbreviations is provided in the Table of Contents to assist the reader in understanding the information presented in this Plan.

This Plan and recommended improvements were prepared in accordance with requirements of Washington Administrative Code (WAC) 173-240-050, which is administered by the Washington State Department of Ecology (Ecology) and meets the requirements of the Washington Growth Management Act (GMA).

This Plan addresses the following key issues:

- The need and timing of the replacement of older, deteriorating sanitary sewer facilities within large, neighborhood-size areas within the City.
- The evaluation of the City's system capacity to address both system deficiency and potential development.
- The evaluation of sanitary sewer lift stations and force mains for removal, rehabilitation, and replacement.
- The City's Infiltration and Inflow (I/I) program to evaluate options and needs for I/I reduction.
- Implementation of recommended improvements by priority which maintains affordable rates for the system users.

1.2 Background and Goals

The City is located in Clark County, Washington near the border of Washington and Oregon. It is next to Vancouver, Washington along the Columbia River as shown in Figure 1.1. The City owns and operates most of the sewer collection system within the City limits and its urban growth boundary (UGB). The collection system is a combination of gravity sewers, pump stations, force mains, and septic tank effluent Pump (STEP) systems. Wastewater is collected and treated by the City at the Camas Wastewater Treatment Plant and then discharged to the Columbia River.

The City completed its last General Sewer Plan in 2010. The Plan provides a recognized framework for making decisions about Camas's sanitary sewer service area which includes properties both inside the City and UGB limits. It is intended to aid decision-makers as well as users, including Wastewater Utility, City Council members, the Mayor, City staff, builders, developers, community groups, and other government agencies.

1.3 Referenced Documents

The following documents were referenced in the preparation of this Plan:

- City of Camas 2010 General Sewer Plan.
- Camas 2035 Comprehensive Plan.
- Camas Code of Ordinances.
- Washington Administrative Code, Title 173. Defines the structure of general sewer plans.
- Criteria for Sewage Works Design (Ecology, 2008). Provides guidance for the design of municipal sewer systems and establishes minimum requirements in the State of Washington.
- Camas 2016 Water System Plan.

1.4 Washington State Requirements

The goals of this Plan, to meet the requirements from the Washington State Criteria for Sewage Works Design, include:

- Prepare the Plan in compliance with WAC Chapter 173-240-050.

Each WAC requirement is detailed in Table 1.1 as well as the location within the plan.

Table 1.1 WAC Plan Requirements

Requirement	Location in Plan
Purpose and need for the proposed plan	Chapter 1
Discussion of who will own, operate, and maintain the system	Chapter 2
Existing and proposed service boundaries	Chapter 4
Layout map including:	
• Proposed sewers and areas proposed to be served by each.	Figures 4.1 and 4.2
• Boundary lines of municipality or district and vicinity.	Figure 1.1
• Existing sewers and areas served by each.	Figure 4.2
• Topography and elevations of existing and proposed ground.	Figure 4.3
• Information on streams, lakes, other bodies of water, and discharges.	Figure 4.6 and 4.8
• Information on water systems.	Figure 4.8
Population trends and methods used to determine those trends	Chapter 3
Information on existing wastewater facilities in the area	Chapter 4, Chapter 7
Discussion of infiltration and inflow problems	Chapter 5
Discussion of the provisions for treatment, discharge, and reuse	Chapter 6, Chapter 7
Information on facilities producing industrial wastewater	Chapter 4
Information on existing wells or other water supply sources	Chapter 4
Discussion of alternatives evaluated, and alternatives chosen	Chapter 6, Chapter 7
Information on existing and proposed cost per service	Chapter 10
Statements regarding compliance with SEPA and, if applicable, NEPA	Appendix A

Notes:
Abbreviations: SEPA – Washington State Environmental Policy Act; NEPA – National Environmental Policy Act.

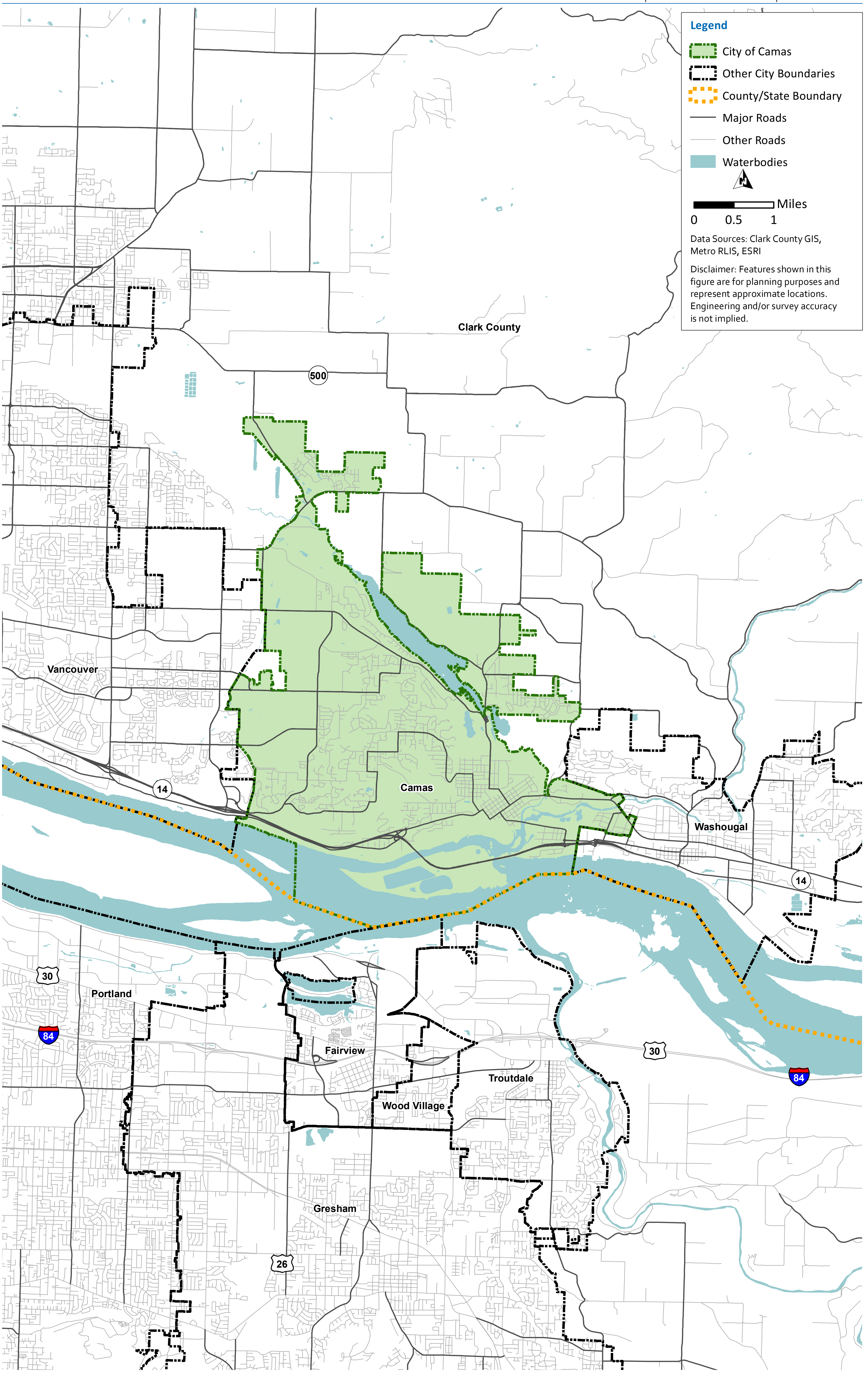


Figure 1.1 Vicinity Map

1.5 Report Organization

This Plan contains ten chapters, followed by appendices that provide supporting documentation for the information presented in the report. The chapters are briefly described below:

- **Chapter 1 - Introduction:** This chapter presents the need for this Plan and the objectives of the study. Lists of abbreviations and reference materials are also provided to assist the reader in understanding the information presented.
- **Chapter 2 - Regulations, Policies, and Criteria:** This chapter documents applicable regulations, summarizes City policies impacting long-term sewer system planning, and presents the City's design criteria which are relevant to sewer system planning.
- **Chapter 3 - Basis of Planning:** This chapter presents an evaluation of historical wastewater flows and loads through the City's collection system and entering the wastewater treatment facility (WWTF). This chapter also establishes the WWTF's flow and load projections based upon future population growth for a 2035 projection and build out.
- **Chapter 4 - Existing System:** This chapter describes the City's existing sewer collection system, adjacent sewer service areas, and WWTF.
- **Chapter 5 - I/I Program:** This Chapter focuses on summarizing the City's efforts on I/I reduction from 2016 through 2018. It summarizes the amount of I/I for these years and specific projects completed to address I/I.
- **Chapter 6 - Collection System:** This chapter presents an evaluation of the available capacity of the existing system to convey current and future sewer flows. Recommendations are provided for improvement projects to address capacity deficiencies and level of service goals.
- **Chapter 7 - Wastewater Treatment Facility:** This chapter summarizes the WWTF Engineering report including condition of existing processes, capacity of existing processes and recommendations that will allow the City to reliably and cost-effectively serve their customers now and into the future.
- **Chapter 8 - Operations and Maintenance:** This chapter provides an overview of the City's Wastewater Utility organization, staffing, and operation and maintenance (O&M) program. This chapter documents existing practices and identifies changes that may improve system operation and maintenance.
- **Chapter 9 - Capital Improvement Program:** This chapter describes the improvements necessary to resolve existing and future deficiencies and accommodate growth. The proposed improvements are also listed by priority and project type.
- **Chapter 10 - Financial Analysis:** This chapter evaluates the financial status of the City's wastewater utility and the ability to finance CIP projects.

Additionally, Technical Memoranda (TM) are included in the appendices as follows:

- **Appendix E - TM 01: Hydraulic Model Update and Calibration.**

Other appendices are included as follows:

- **Appendix A - Approvals.**
- **Appendix B - Agency Comment Letters and Responses.**
- **Appendix C - Demographic Projections.**
- **Appendix D - Flow Monitoring Report.**

- **Appendix E - TM 01: Hydraulic Model Update and Calibration.**
- **Appendix F - I/I Program Reports.**
- **Appendix G - Local Limits Program Reports.**
- **Appendix H - Wastewater Treatment Plant Permits.**
- **Appendix I - Wastewater Treatment Engineering Report.**
- **Appendix J - Spill Response Plan.**
- **Appendix K - CIP Project Sheet.**
- **Appendix L - Financial Backup.**
- **Appendix M - O&M APE Examples.**

1.6 SEPA and Approval Process

A SEPA Checklist has been prepared for this Plan and is presented in Appendix A. It is anticipated that this proposed Plan will not have a probable significant adverse impact on the environment and that an environmental impact statement (EIS) will not be required. However, many of the projects proposed herein will require SEPA checklists and an engineering determination will be made with each individual project.

This Plan includes review by adjacent utility systems. All comments are included in Appendix B, Agency Comment Letters and Responses.

1.7 Acknowledgements

Carollo Engineers, Inc. (Carollo) and their team members would like to acknowledge and thank the following individuals for their efforts and assistance in completing this Plan. Their cooperation and courtesy in obtaining a variety of necessary information were valuable components in completing and producing this report:

- Bob Busch, City of Camas, Wastewater Treatment Plant Operations Supervisor.
- Sam Adams, City of Camas, Utilities Manager.

Chapter 2

POLICIES AND CRITERIA

2.1 Introduction

The City of Camas (City) is responsible for managing and operating its wastewater system in accordance with all local, state, and federal regulations. To best manage the wastewater system and comply with regulations, the City has adopted wastewater system policies and criteria. These policies guide the development and financing of the infrastructure required to provide wastewater service and document the City's commitments to current wastewater system customers as well as those considering service from the City. The following sections outline the City's policies and design criteria that are relevant to sewer system planning. Existing policies are listed in Table 2.2 through Table 2.5. Proposed new policies are also listed in each table. These policies and criteria will guide the planning process throughout this General Sewer Plan (Plan).

The policies and criteria are organized into the following categories:

- Table 2.1 - Service Policies and Extensions.
- Table 2.2 - Environmental Stewardship.
- Table 2.3 to Table 2.5 - Design Policies and Criteria.
- Table 2.6 - Financial Policies.

2.2 Sewer Service

Table 2.1 summarizes the existing policies regarding the wastewater service area and extension of sewer service to additional customers. The City is committed to serving customers in its sewer service area in accordance with established policies. The current sewer service area includes approximately 7,400 acres within its corporate boundaries. The future service area has been defined as the City's Urban Growth Boundary (UGB).

Table 2.1 Service Policies and Extensions

Subject	Policy	Source
Service Area	Where service is available, require connection to public water for domestic and irrigation needs and connection to sewer systems. The intent is to not wait for the malfunction of a well or septic system if service is available.	Camas 2035 Comprehensive Plan U-1
Service Area	Within UGAs, the City should be the sole provider of urban services.	Camas 2035 Comprehensive Plan U-4
Service Area	Extend public sanitary sewer service, which is required within urban areas, throughout urban areas. Service may be provided outside urban areas to serve areas where imminent health hazards exist.	Camas 2035 Comprehensive Plan SS-1
Utility Extension	Do not extend utilities without annexation or commitments for annexation. Exceptions may be made in cases where human health is threatened. In areas where utilities presently extend beyond City limits, but are within UGAs, the City should plan development jointly with the County. A joint development must be consistent with City standards.	Camas 2035 Comprehensive Plan U-5
System Ownership	The sanitary sewage disposal system of the city, including the treatment plant and all other parts of such system and all additions and improvements thereto and extensions thereof, which may be made hereafter, shall be considered as a part of and belonging to the water works utility of the city. The cost of the construction and installation of the hereinafter provided additions, improvements and extensions and the cost of maintenance and operation of such system as improved shall be charged to the water works utility of the city, and any rates and charges which may be collected hereafter for sewage disposal service shall be paid into the "water and sewer revenue fund" of the city, to be hereafter created.	(CMC) 13.60.010
Ownership of System - Commercial and Industrial	All STEP systems serving commercial, industrial, and other nonresidential properties shall be owned by the owner of the subject property, except for the service box at the point where the STEP system connects to the city sanitary sewer system, which shall be owned by the city. The owner shall be responsible for maintaining all components of the STEP system and its ownership and shall be responsible for pumping the STEP tank as needed and for disposing of the waste in an approved manner. The owner shall further be responsible for paying all electrical costs associated with the operation of the STEP system.	CMC 13.62.060(B)
Ownership of System - Residential	After inspection and acceptance of an installed STEP system on residential property, the city shall be the owner of all components of the STEP system with the exception of the sewer line from the structure to the tank, which shall be owned by the property owner. The city will be responsible for maintaining the components of the STEP system owned by the city, and in addition will be responsible for pumping the STEP tank and disposing of waste material when required. The owner will be responsible for maintaining the sewer line connecting the tank to the structure on the subject property. The owner will further be responsible for paying for all electrical costs associated with the operation of the STEP system.	CMC 13.62.060(A)
Construction	On and after May 1, 1949, it shall be unlawful to construct any means of sewerage or excreta disposal such as septic tanks without having first obtained a permit from the city health officer or his authorized representative.	CMC 13.60.040
Sewer Lien and Ownership	The city shall have a lien against premises to which sewer service is available for delinquent and unpaid charges for sewer services, for penalties levied pursuant to Section 13.60.050(B), for unpaid connection charges, and for unpaid sewer system development charges. All such delinquent charges shall bear interest at the rate of eight percent per annum. Such lien shall be superior to all other liens and encumbrances except general taxes and local and special assessments.	CMC 13.60.055(A)
Connections	All property owners whose property abuts a street or alley in which there is a public sanitary sewer or which is within one hundred fifty feet of a public sanitary sewer may be required to connect their private drains and sewers to the city sanitary sewer system at the direction of the city engineer. Those properties which abut a street or alley in which there is a public sanitary sewer or which are located within one hundred fifty feet of a public sanitary sewer, and which are located within a designated health hazard area or which pose a threat to the general health, shall be connected to the sanitary sewer. Such connection shall be in the most direct manner possible and with a separate connection for each residence or structure.	CMC 13.60.050(A)
Prohibited Connection	Prohibit construction of new private wells and subsurface sewage disposal systems in new developments.	Camas 2035 Comprehensive Plan U-2

Subject	Policy	Source
Application to Connect a STEP System	Any property owner seeking to connect his property to the sanitary sewer system of the city by means of a STEP system shall file an application with the public works department on a form provided by the city. The application shall contain the name and address of the owner, the location of the property to be connected to the sanitary sewer system, the nature of the structure to be constructed on the subject property, the proposed use of the subject property, the proposed location of the STEP system, the design of the STEP system, and such other information as the public works department may require. Upon receipt of any such application, the public works director, or his authorized designee, shall review the application and grant the same if he determines that the subject property is suitable for use of a STEP sanitary sewer system, and if the design, location and other information set forth in the application comply with the standards and specifications adopted by the city for STEP systems and the criteria set forth in this chapter.	CMC 13.62.030
Installation Responsibility of a STEP system	The individual owner shall be responsible for and shall pay for the installation of the STEP/ STE system, including but not limited to, service connection per CMC 13.64.050 if required, the tank, pump apparatus, control box, electrical wiring, conduit, plumbing from the structure to the tank, plumbing from the tank to the service box, excavation and backfill material. The city shall, prior to installation, determine the appropriate size tank.	CMC 13.62.040(A)
Sewer Responsibility	Sanitary sewers shall be provided to each lot at no cost to the city and designed in accordance with city standards: • Detached units shall have their own sewer service and STEP or STEF or conventional gravity system as required. • Duplex units may have up to two sewer services at the discretion of the engineering and public works departments. • Multifamily units shall have one sewer lateral per building. • Commercial or industrial units shall have privately owned and maintained sewer systems acceptable to the city.	CMC 17.19.040(C)
Right-of-Entry Agreement	Any owner seeking to connect his property to the sanitary sewer system of the city by means of a STEP system shall be required to execute a right-of-entry agreement authorizing the city and its employees to have access to the owner's property for the purpose of maintaining and inspecting the STEP system and appurtenances thereto. Such right-of-entry agreement shall be executed upon approval of an application for a STEP system.	CMC 13.62.050
Inspection	The superintendent and other duly authorized employees of the city bearing proper credentials and identification shall be permitted to enter upon all properties for the purpose of inspecting, observing, measuring, sampling, and testing sewer connections, operations, and facilities in accordance and to ensure compliance with the provisions of this chapter. No such entry or inspection shall be made without the consent of the owner or occupant of such building or premises unless the city employee shall have obtained a search warrant, or unless exigent circumstances exist that would justify an inspection and entry without obtaining a warrant.	CMC 13.68.030
Enforcement	It shall be the duty of the city health officer or his authorized agent to enforce the provisions of Sections 13.60.020 through 13.60.110 and in the performance of this duty the health officer or his duly authorized agent is authorized to enter at any reasonable hour any premises as may be necessary in the enforcement of Sections 13.60.020 through 13.60.110.	CMC 13.60.080
FOG and Capacity	Grease, oil and sand interceptors shall be provided, when in the opinion of the superintendent, they are necessary for the proper handling of liquid wastes containing grease in excessive amounts, or any flammable wastes, sand, and other harmful ingredients, except that such interceptors shall not be required for private living quarters. All interceptors shall be of a type and capacity approved by the superintendent and shall be located as to be readily and easily accessible for cleaning and inspection.	CMC 13.68.020(H)
Private System - Flush toilet	Every residence, place of business or other building or place where persons congregate, reside or are employed and which does not abut a street or alley in which there is a public sanitary sewer shall be provided with a private water-flush toilet by the owner or agent of the premises; said water-flush toilet system to be built or rebuilt, constructed and maintained in such a manner as to meet the requirements of construction and maintenance hereinafter described.	CMC 13.60.060

Notes:
Abbreviations: CMC - Camas Code of Ordinances; FOG - fats, oil, and grease; STE - septic tank effluent; STEF - septic tank effluent filter; STEP - septic tank effluent pump; UGA - urban growth area.

2.2.1 Environmental Stewardship

The following section summarizes existing policies regarding environmental stewardship.

Table 2.2 Environmental Stewardship Policies

Subject	Policy	Source
Allowable Discharges	Examples of allowable discharges include the following: • Broken water mains. • Diverted stream flows. • Rising ground waters. • Uncontaminated ground water infiltration, as defined in 40 CFR 35.2005(20). • Uncontaminated pumped ground water. • Foundation drains. • Air conditioning condensation. • Irrigation water from agricultural sources that is commingled with urban stormwater. • Springs. • Water from crawl space pumps. • Footing drains. • Flows from riparian habitats and wetlands. • Discharges from emergency firefighting activities.	CMC 14.04.070
Conditional Discharges	The following types of discharges shall not be considered illegal discharges for the purposes of this chapter if they meet the stated conditions, or unless the Director determines that the type of discharge, whether singly or in combination with others, is causing or is likely to cause pollution of surface water or groundwater: • Potable water, including water from water line flushing, hyperchlorinated water line flushing, fire hydrant system flushing, and pipeline hydrostatic test water. Planned discharges shall be de-chlorinated to a concentration of 0.1 ppm or less, pH-adjusted, if necessary and in volumes and velocities controlled to prevent re-suspension of sediments in the stormwater system. • Lawn watering and other irrigation runoff are permitted but shall be minimized. • De-chlorinated swimming pool discharges. These discharges shall be de-chlorinated to a concentration of 0.1 ppm or less, pH-adjusted, if necessary and in volumes and velocities controlled to prevent re-suspension of sediments in the stormwater system. • Street and sidewalk wash water, water used to control dust, and routine external building wash down that does not use detergents are permitted if the amount of street wash and dust control water used in minimized. At active construction sites street sweeping must be performed prior to washing the street. • Non-stormwater discharges covered by another NPDES permit, provided, that the discharger is in full compliance with all requirements of the permit, waiver, or order and other applicable laws and regulations; and provided, that written approval has been granted for any discharge to the storm drain system. • Other non-stormwater discharges. The discharges shall be in compliance with the requirements of a SWPPP, reviewed and approved by the city, which addresses control of such discharges by applying AKART to prevent contaminants from entering surface or ground water.	CMC 14.04.080
Septic System Elimination	Coordinate with Clark County to eliminate septic systems.	Camas 2035 Comprehensive Plan U-5
Illicit Connections	The following connections, both past, current, and future, to the stormwater system are expressly prohibited: • The construction, use, maintenance, or continued existence of illicit connections to the storm drain system is prohibited. • This prohibition expressly includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection. • A person is considered to be in violation of this chapter if the person connects a line conveying sewage to the MS4 or allows such a connection to continue.	CMC 14.04.090
Wastewater Discharges	Except as hereinafter provided, no person shall discharge or cause to be discharged any of the following described water or wastes to any public sewer: • Any liquid or vapor having a temperature higher than 150 °F. • Any water or waste which may contain more than 100 ppm by weight, of FOG. • Any gasoline, benzene, naphtha, fuel oil, motor oil, lubricants or other flammable or explosive liquid, solid or gas. • Any garbage that has not been properly shredded. • Any ashes, cinders, sand, mud, straw, shavings, metal, glass, rags, feathers, tar, plastics, wood, paunch manure, or any other solid or viscous substance capable of causing obstruction to the flow in sewers or other interference with the proper operation of the sewage works. • Any waters or wastes having a pH lower than 5.5 or higher than 9.0 or having any other corrosive property capable of causing damage or hazard to structures, equipment, and personnel of the sewage works. • Any waters or wastes containing a toxic or poisonous substance in sufficient quantity to injure or interfere with any sewage treatment process, constitute a hazard to humans or animals, or create any hazard in the receiving waters of the sewage treatment plant. • Any waters or wastes containing suspended solids of such character and quantity that unusual attention or expense is required to handle such materials at the sewage treatment plant. • Any noxious or malodorous gas or substance capable of creating a public nuisance.	CMC 13.68.020(C)

Notes:
Abbreviations: °F - degrees Fahrenheit; AKART - all known, available and reasonable methods of prevention, control and treatment; CFR - Code of Federal Regulations; MS4 - Municipal Separate Storm Sewer System; NPDES - National Pollutant Discharge Elimination System, ppm - parts per million; SWPPP - stormwater pollution prevention plan

2.2.2 Design Criteria and Standards

The City's wastewater system design standards, design details, specifications, and construction standards are documented in the Camas Design Standards Manual (2019) available from this City's Public Works department website. Additional design requirements and recommendations applicable to the City's sewer system are found in the Washington State Department of Ecology's (Ecology) *Criteria for Sewage Works Design* book, also known as the Orange Book. Current design criteria policies are outlined in Table 2.3.

The following section summarizes the existing and proposed policies regarding system design. It is recommended that the proposed new policies listed below be adopted by the City. Within this Plan, the capacity limitations of the collection system are evaluated against the proposed new design criteria policies.

Table 2.3 Design Criteria Policies

Subject	Policy	Source
Design	• Sewer systems shall be designed and constructed to achieve total containment of sanitary wastes and maximum exclusion of I/I. No new combined sewers will be approved.	Orange Book Section C1-1.3
Sewer location	• Siting of public sanitary sewer mains and MHs shall be restricted to the public right-of-way and/or easement dedicated for this utility.	Orange Book SectionC1-1.5
Design Period	• Service laterals shall be designed for the ultimate development of the parcel being served. • Collection sewers (that is, laterals and submains) shall be designed for the ultimate development of the tributary area. • Selection of the design period for trunk and interceptor sewers shall be based on an evaluation of economic, functional, and other considerations.	Orange Book Section C1-3.2
Design Flows	• Sewer systems shall be designed on the basis of per capita flows for the design period in conjunction with a peaking factor or approved alternative methods. • Generally, the sewers shall be designed to carry at least the peak hourly flow when operating at capacity. Peak hourly flow should be the design average daily flow in conjunction with a peaking factor.	Orange Book Section C1-3.3
Lift Station Design Criteria	• The firm capacity of a pumping station shall be equal to or greater than the peak hourly design flow. Because mechanical and electrical equipment is typically designed for a 20-year life, it is recommended that the peak design flow be based on a 20-year forecast or greater. • The number of pumps selected shall allow the station to provide the peak design flow with the largest pump out of order. • The station shall be designed to remain fully operational during the 100- year flood/wave event.	Orange Book Sections C2-1.2.1 C2-1.2.3 C2-1.1
Lift Station Pump	• Pumps should be designed for pumping sewage and capable of passing solids at least three inches in diameter. Pump suction and discharge should be four inches or greater.	Orange Book Section C2-1.2.4
Design Storm	• In accordance with all applicable federal, state, and local regulations, the City should design its wastewater system facilities to adequately and reliably convey peak hour flows associated with a Design Storm event without overflowing or discharging to any water bodies. The Design Storm is defined as a 20-year interval, 24-hour storm recorded at Portland International Airport rain gauge.	Proposed New Policy
Emergency Back-up Power	• All sewage pump stations should be designed with capability for emergency power in case the primary electrical feed is out of service. A portable engine generator unit that is plugged into a pigtail at the pump station commonly provides emergency power for small pump stations. Larger pump stations should have permanent engine generator units with automatic transfer switches to transfer the electrical feed from the primary to the standby unit when a power failure is detected by the instrumentation and control system.	Orange Book Section C2-1.8.3
Surcharging	• The City's design criteria require the depth of flow versus the diameter of the pipe (d/D) ratio to be equal to or less than 1 during the design storm (no surcharging).	Proposed New Policy
Inflow/ Infiltration	• Future development shall be designed for a peak inflow and infiltration rate of 1,100 gpad.	Proposed New Policy

Notes:
Abbreviations: d/D - depth versus diameter; gpad - gallons per acre per day; MH - manhole.

2.2.2.1 Wastewater Treatment Plant Design Criteria

The Ecology maintains requirements for hydraulic and loading capacities as well as the redundancy of treatment processes and equipment. These requirements are presented in the Orange Book, Ecology's guidelines for WWTF design (2008) and are derived from the Federal standards developed by the U.S. Environmental Protection Agency (EPA). Flow requirements are detailed in Table 2.4.

Ecology's criteria for designation of WWTFs are divided into three reliability classes based on the nature of their receiving water. Corresponding redundancy and reliability requirements are presented in Table 2.5 based on Ecology's guidelines and Federal standards. These requirements are the basis of the capacity analysis.

Table 2.4 Flow Requirement

WWTF Component	Flow Requirement	Source
Influent Screens	A backup screen designed for mechanical or manual screening must be provided. Influent screens must accommodate all flows.	(1)
Primary Clarifiers	Units must be sufficient in number and size to allow peak hour design flow including recirculation flow for overflow rate and weir loading rate. Surface overflow rates recommended are 400 to 600 gpd/sq ft at average design flow and 1,200 to 1,500 gpd/sq ft at peak design flow.	(1)
Primary Sludge Pumps	A backup pump must be provided that that matches the largest pump and motor. Pumps must handle peak design flows with the largest units out of service.	(1)
Degritting Cyclone and Grit Classifier	The system must contain components to remove grit and other heavy inorganic solids.	(1), (2)
Aeration Basins	A backup basin will not be required. At least two equal volume basins must be provided. All units in service for peak flow and loading conditions.	(1)
Internal Recycle Pumps	A backup pump must be provided that that matches the largest pump and motor. Pumps must handle peak design flows with the largest units out of service.	(1), (2)
Aeration Systems	A sufficient number of aerators to enable the design oxygen transfer to be maintained with the largest unit out of service.	(1), (2)
Secondary Clarifiers	Units must be sufficient in number and size to allow PHDF including recirculation flow for overflow rate and weir loading rate.	(1)
RAS Pumps	A backup pump must be provided that that matches the largest pump and motor. Pumps must handle peak design flows with the largest units out of service.	(1)
WAS Pumps	A backup pump must be provided that that matches the largest pump and motor. Pumps must handle peak design flows with the largest units out of service.	(1)
Effluent Filters	Secondary effluent polishing filters must pass all flows requiring tertiary treatment.	(1)
UV Channel	Equipment sized to provide maximum day design flow with to meet disinfection requirements and accommodate peak hour design flow hydraulically.	(1)
Effluent Pump Station	A backup pump must be provided that that matches the largest pump and motor. Pumps must handle peak design flows with the largest units out of service.	(1)
Gravity Thickener	Redundant units provided for equipment maintenance. Ability to thicken and dewater maximum sludge production with all units in service.	(1) (2)
Rotary Drum Thickener	Redundant units provided for equipment maintenance. Ability to thicken and dewater maximum sludge production with all units in service.	(1) (2)
Primary Anaerobic Digesters	Redundant units provided for equipment maintenance. Ability to thicken and dewater maximum sludge production with all units in service.	(1) (2)
Digested Sludge Pumps	A backup pump must be provided that that matches the largest pump and motor. Pumps must handle peak design flows with the largest units out of service.	(1)
Dewatering Centrifuge	Redundant units provided for equipment maintenance. Ability to thicken and dewater maximum sludge production with all units in service.	(1) (2)
Biosolids Dryer	Redundant units provided for equipment maintenance. Ability to thicken and dewater maximum sludge production with all units in service.	(1) (2)

Notes:
(1) Criteria for Sewage Works Design (Ecology, 2008).
(2) Design Criteria for Mechanical, Electric, and Fluid Systems and Component Reliability (EPA, 1974).
Abbreviations: gpd/sg ft - gallons per day per square foot; PHDF - peak hour demand flow; RAS - return activated sludge; UV - ultraviolet; WAS - waste activated sludge.

Table 2.5 Wastewater Treatment Plant Redundancy and Reliability Requirements

WWTF Component	Flow Criteria	Load Requirement	Redundancy
Influent Screens	Pass all flows	-	1 Unit Out of Service
Primary Clarifiers	PHF + Recirculation	Peak Hour Design Load (1)	All Units in Service
Primary Sludge Pumps	Peak Instantaneous Design Flow	Maximum Daily Design Load	1 Unit Out of Service
Degritting Cyclone	PHF	-	Minimum 2 Units
Grit Classifier	PHF	-	1 Unit Out of Service
Aeration Basins	Maximum Week Design Flow Maximum Daily Design Flow	Maximum Daily Design Load Maximum Daily Design Load	All Units in Service All Units in Service
Internal Recycle Pumps	PHF	-	1 Unit Out of Service
Aeration Systems	-	Peak Hour Design Load (2)	1 Unit Out of Service
Secondary Clarifiers	PHF + Recirculation	Peak Hour Design Load (1)	All Units in Service
RAS Pumps	MMF	-	1 Unit Out of Service
WAS Pumps	Peak Instantaneous Design Flow	Maximum Daily Design Load	1 Unit Out of service
Effluent Filters	All flows requiring tertiary treatment	-	-
UV Channel	PHF	-	1 Unit Out of Service
Effluent Pump Station	Peak Instantaneous Design Flow	-	1 Unit Out of Service
Gravity Thickener	-	Maximum Daily Design Load (2)	1 Unit Out of Service
Rotary Drum Thickener	-	Maximum Daily Design Load (2)	1 Unit Out of Service
Primary Anaerobic Digesters	-	Maximum Daily Design Load (2)	1 Unit Out of Service
Digested Sludge Pumps	-	-	1 Unit Out of Service
Dewatering Centrifuge	-	Maximum Daily Design Load (2)	1 Unit Out of Service
Biosolids Dryer	-	Maximum Daily Design Load (2)	1 Unit Out of Service

Notes:
(1) Total suspended solids (TSS) loading only.
(2) 5-day biochemical oxygen demand (BOD_5) loading only.
Abbreviations: PHF - peak hour flow; MMF - maximum monthly flow

2.2.3 Financial Policies

The City's financial polies support the operation of the wastewater utility. A summary of financial polices applicable to the Plan are outlined in Table 2.6.

Table 2.6 Financial Policies

Subject	Policy	Source
Credits	Those properties that have been disconnected from the city sewer system since January 1, 1972, shall receive a credit for the prior connection. The credit for the prior connection shall be in an amount equal to the sewer system development charge for the use classification of the prior connection. The sewer system development charge imposed under this chapter shall be the difference between the amount due under the present use classification less the amount that would have been assessed under the use classification for the prior connection, provided however, that the city shall not be required to reimburse the property owner in the event the credit exceeds the sewer system development charge for the new connection.	CMC 13.72.040(A)
Credits	Those properties that are not presently connected to the city's sewer system but which have been assessed and paid a monthly penalty pursuant to Section 13.60.050(B) shall receive a credit against the sewer system development charge in an amount equal to the total monthly penalties paid prior to connection, provided however, that the city shall not be required to reimburse the property owner in the event the credit exceeds the sewer system development charge for the new connection.	CMC 13.72.040(B)
Violation	Any person, firm or corporation who violates or refuses or fails to comply with any of the provisions of Sections 13.60.020 through 13.60.110 shall be guilty of a misdemeanor and shall be punished by a fine of not less than twenty-five dollars nor more than one hundred dollars or imprisoned in the city jail for a period of thirty days or by both such fine and prison term.	CMC 13.60.090
Inflow Connection	There is imposed upon those property owners who are within the area served by the sanitary system and who refuse to connect to such sanitary sewer system a penalty in an amount equal to the charge that would have been made for sewer service if such property had been connected to the sanitary sewer system. Such penalties as provided herein shall accrue monthly until such property is connected to the sanitary sewer system. All penalties collected pursuant to this provision shall be considered revenue of the sanitary sewer system.	CMC 13.60.050(B)
Sewer Service Development	Pursuant to the authority conferred upon cities and towns by RCW 35.92.020 and 35.92.025, the city council of the city finds that property owners who seek to connect property to the sewer system of the city should be assessed a charge in order that such property shall bear its equitable share of the cost of the sewer system. The council further finds that the charge should be based upon the property owner's anticipated use of the sewer system as related to the historical cost of the sewer system and the projected cost of additions to the sewer system to meet new demand. That portion of the charge based upon the historical costs of the sewer system shall be measured by the undepreciated value of the sewer system and plant in service at the time the charge is imposed. That portion of the charge based upon the projected cost of future improvements shall be based upon appropriate studies by engineers and/or financial consultants. The charge imposed by this chapter shall be denominated as a "sewer system development charge" and shall be in addition to any sewer connection or permit fees imposed by other ordinances of the city.	CMC 13.72.010
Damage to STEP	The cost of repairing any damage to a STEP system which has resulted from the negligence, gross negligence, or intentional acts of the owner shall be the responsibility of the owner. This responsibility includes any clogging which may result due to improper use of the STEP system by the owner.	CMC 13.62.070
Connection Charges for STEP	Except as hereinafter provided, the connection charge for connecting a STEP/STE sewer system to the Camas municipal sewer system shall be the cost of materials, the costs of labor for city personnel at then prevailing rate for such personnel, and the amount of any fees or charges required to be paid to any third parties in order to make such connection.	CMC 13.64.050(A)
Connection Charges for STEP	The connection charge for connecting a STEP/STE sewer system to the Camas municipal sanitary sewer system with a one-inch service line or less shall be as per the fee schedule established by the city council per resolution, or the actual cost to the city calculated in accordance with subsection A of this section, whichever is greater.	CMC 13.64.050(B)
Connection Charges for STEP	No connection charge will be assessed if a service line has already been installed connecting the subject property to the city sanitary sewer system.	CMC 13.64.050(C)

Notes:
Abbreviations: RWC - Revised Code of Washington.

2.2.4 Regulatory Requirements

The City's criteria is developed based on federal and state statues, regulations, and permits. These laws help to determine the design criteria for the City's collection, treatment, and disposal facilities. These regulatory requirements are outlined in Table 2.7.

Table 2.7 Regulatory Requirements

Subject	Policy
Federal Clean Water Act Condition S1	Condition S.1 of the City's permit requires the treatment plant effluent to meet limits for BOD_5, TSS, fecal coliform bacteria, pH, and total ammonia.
Federal Clean Water Act Condition S2	Condition S.2.lists monitoring requirements including influent and effluent flow, BOD_5, TSS, pH, temperature, total ammonia, fecal coliform, priority pollutant metals, oil and grease and cyanide. A program to address oil and grease is also required. The City must monitor twice per 5 years for effluent whole effluent toxicity and conduct quarterly and yearly priority pollutant monitoring of its influent and effluent in support of its industrial pretreatment program. Additionally, per the terms of the City's coverage under the Statewide Biosolids permit, the City must annually test its biosolids for pollutants and compliance with pathogen reduction and vector attraction reduction criteria.
Federal Clean Water Act Condition S4	Condition S.4.A specifies the WWTF design capacity for maximum month BOD_5 loading is 5,616 lbs/day and 6,405 lbs/day for TSS. The peak hour flow, dry weather monthly average, and maximum month average flow capacities for the WWTF are 11.09, 2.86 and 6.10 mgd, respectively. Condition S.4.B requires the City to prepare a plan to maintain adequate capacity when flows and loadings to the WWTF exceed 85% of design capacity for 3-consecutive months.
National Environmental Policy Act	The NEPA was established in 1969 and requires federal agencies to determine environmental impacts on all projects requiring federal permits or funding. Federally delegated activities such as NPDES permits or Section 401 Certification are considered state actions and do not require NEPA compliance. If a project involves federal action (through, for example, an Army Corps of Engineers Section 404 permit), and is determined to be environmentally insignificant, a (FONSI) is issued, otherwise an Environmental Assessment (EA) or Environmental Impact Statement (EIS) would be required. NEPA is not applicable to projects that do not include a federal component.
Federal Clean Air Act	The Federal Clean Air Act requires all wastewater facilities to plan to meet the air quality limitations of the region. The City falls in the jurisdiction of the Southwest Clean Air Agency (SWCAA). The SWCAA is responsible for enforcing federal, state and local outdoor air quality standards and regulations in Clark, Cowlitz, Lewis, Skamania and Wahkiakum counties of southwest Washington state. The Camas generator is permitted by SWCAA.
State Water Pollution Control Act	The intent of the state Water Pollution Control Act is to "maintain the highest possible control standards to ensure the purity of all waters of the state consistent with public health and the enjoyment…the propagation and protection of wildlife, birds, game, fish and other aquatic life, and the industrial development of the state." Under the RCW 90.48 and the (WAC) 173-240, Ecology issues permits for wastewater treatment facilities and land application of wastewater under WAC 246-271.
Criteria for Sewage Works Design, Ecology	Ecology has published design criteria for collection systems and wastewater treatment plants. While these criteria are not legally binding, their use is strongly encouraged by Ecology since the criteria are used by the agency to review engineering reports for upgrading wastewater treatment systems. Commonly referred to as the "Orange Book," these design criteria primarily emphasize unit processes through secondary treatment, and also includes criteria for planning and design of wastewater collection systems. Any expansion or modification of the City collection system and/or WWTF plant will require continued conformance with Ecology criteria.
Certification of Operators of Wastewater Treatment Plants, WAC 173-230	Wastewater treatment plant operators are certified by the state Water and Wastewater Operators Certification Board. The operator assigned overall responsibility for operation of a wastewater treatment plant is defined by WAC 173-230 as the "operator in responsible charge." This individual must have state certification at or above the classification rating of the plant. The City WWTF is currently assigned a Class 4 rating and the operating staff assigned to the plant have the required certification. (One of the operators has a Class 4 certification; two have Class 3 certification, and one has Class 2 certification).
Surface-Water Quality Standards (WAC 173-201A)	In the State of Washington, WAC 173-201A establishes water quality standards for surface waters based on maintaining public health, recreational use and protection of fish, shellfish, and wildlife. Surface water quality standards include five groups: AA (extraordinary), A (excellent), B (good), C (fair), and Lake Class. Each class has its own characteristic use and measurable criteria. Measurable parameters used to distinguish the different surface water classifications include fecal coliform levels, dissolved oxygen concentration, temperature, pH, and turbidity. The surface water criteria include 29 toxic substances, including ammonia, residual chlorine, several heavy metals, polychlorinated biphenyls (PCBs), and pesticides.
State Environmental Policy Act	WAC 173-240-050 requires a statement in all wastewater comprehensive plans regarding proposed projects in compliance with the SEPA, if applicable. The capital improvements proposed in this plan will fall under SEPA regulations. A SEPA checklist is included in Appendix A of this report for use in the environmental review for the project. In most cases a DNS is issued; however, if a project will have a probable significant adverse environmental impact an EIS will be required.
Accreditation of Environmental Laboratories (WAC 173-050)	The State of Washington established a requirement that all laboratories reporting data to comply with NPDES permits must be generated by an accredited laboratory. This accreditation program establishes specific tasks for QA/QC that are intended to ensure the integrity of laboratory procedures. Accreditation requirements must be met for any on-site laboratory or outside laboratory used to analyze samples. Only accredited laboratories may be used for analyses reported for compliance with NPDES permits. In planning for an on-site laboratory, staffing must be sufficient to allow for QA/QC procedures to be performed. The Camas WWTF lab is currently accredited for determination of the following parameters TSS, BOD_5, ammonia, dissolved oxygen, pH and fecal coliform.
Minimal Standards for Solid Waste Handling (WAC 173-304)	Grit and screenings are not subject to the sludge regulations in WAC 173-308, but their disposal is regulated under the state solid waste regulations, WAC 173-304. Waste placed in a municipal solid waste landfill must not contain free liquids, nor exhibit any of the criteria of a hazardous waste as defined by WAC 173-303. To be placed in a municipal solid waste landfill, grit, screenings, and incinerator ash must pass the paint filter test. This test determines the amount of free liquids associated within the solids, and includes the TCLP test, which determines if the waste has hazardous characteristics.
Shoreline Management Act	The Shoreline Management Act of 1971 (RCW 90.58) establishes a broad policy giving preference to shoreline uses that protect water quality and the natural environment, depend on proximity to the water, and preserve or enhance public access to the water. The Shoreline Management Act jurisdiction extends to lakes or reservoirs of 20 acres or greater, streams with a mean annual flow of 20 cfs or greater, marine waters, and an area inland 200 ft from the ordinary high-water mark. Projects are reviewed by local governments according to state guidelines and a local Shoreline Master Program. The Camas wastewater treatment plant and portions of the collection system are located within shoreline areas.

Notes:
Abbreviations: cfs - cubic feet per second; DNS - determination of non-significance; FONSI - finding of no significant impact; lbs/day - pounds per day; mgd - million gallons per day; NEPA - National Environmental Policy Act; TCLP - toxic characteristic leachate procedure; QA/QC - quality assurance and quality control; WAC - Washington Administrative Code

2.2.4.1 NPDES Permit

Table 2.8 presents a brief overview of relevant design criteria and effluent limitations contained in the City's WWTF NPDES Permit No. WA0020249. The City's current permit was issued September 15, 2015 and effective October 1, 2015. This NPDES permit places limits on various water quality parameters, flow rates, and waste loading pertaining to the discharge of treated effluent from the WWTF.

Table 2.8 NPDES Influent Design Criteria and Effluent Limits

NPDES Influent Design Criteria and Effluent Limits		
NPDES Influent Design Criteria		
Parameter		Value
MMF		6.1 mgd
Monthly Average Dry Weather Flow		2.86 mgd
BOD_5 Max Month Loading		5,616 lbs/day
TSS Max Month Loading		8,011 lbs/day
NH_3-N Max Month Loading		1,956 lbs/day
NPDES Effluent Limits		
Parameter	Average Monthly Limit	Average Weekly Limit
BOD_5	• 20 mg/L • 74% removal of influent • 1,017 lbs/day	• 30 mg/L • 1,525 lbs/day
TSS	• 20 mg/L • 76% removal of influent • 1,017 lbs/day	• 30 mg/L • 1,525 lbs/day
Fecal Coliform Bacteria(1)	• 200 organisms/100 mL	• 400 organisms/100 mL
NH_3-N Summer(2)	• 20 mg/L	• N/A
NH_3-N Winter	• 7 mg/L	• N/A

Notes:
(1) Geometric mean.
(2) Summer ammonia limits apply to the months of June through September.
Abbreviations: mg/L - milligrams per liter; mL - milliliter; NH_3-N - ammonia.

Chapter 3
BASIS OF PLANNING

3.1 Introduction

This chapter presents an evaluation of historical wastewater flows and loads through the City of Camas's (City's) collection system and entering the wastewater treatment facility (WWTF). This chapter establishes the WWTF's flow and load projections based upon future population growth through 2035.

The remainder of this Chapter is divided into four sections:

- Section 3.2 provides definitions for the wastewater flow terminology used in this chapter, as it is not commonly used outside of planning and design evaluations.
- Section 3.3 presents the collection system flow monitoring results, which are used to set a baseline for flow projections and development of the hydraulic model.
- Section 3.4 presents projected flows and loads for the City's collection system, which are used in hydraulic modelling evaluations.
- Section 3.5 presents projected flows and loads for the WWTF, which are used in unit process capacity evaluations.

The collection system and WWTF projections are based on demographic growth projections from the *2035 Comprehensive Plan*. However, slightly different methodologies are used to project wastewater flows in the collection system and WWTF due to the requirements of the analyses and availability of data. Two major factors drive these differences. First, the collection system uses flow monitoring data from four-month period in the winter of 2018 and 2019, while the WWTF analysis uses historical influent data from 2015 through 2018. Second, the WWTF flows ware only projected for 2035, while collection system flows are projected for 2035 and buildout period. Collection system piping is typically sized using the buildout period projections since these pipes have a 75-year service life.

3.2 Definitions

Wastewater flows are analyzed by separating dry weather flow from wet weather flow to establish base flows. These base flows identified during dry weather are then used as the basis to project both wet and dry weather flows. Due to the separate collection system and WWTF projections established, the following terminology was utilized to differentiate the various flow parameters:

- **Influent Dry Weather Flow (IDWF)** is the average daily flow during the two driest months of the year (July and August). The IDWF includes the base flow generated by the City's residential and commercial connections plus the dry weather groundwater infiltration (GWI) component. For the City, the IDWF was estimated throughout the service area based on the historical influent flow data from the WWTF.

- **Average Dry Weather Flow (ADWF)** establishes a similar flow parameter as IDWF; ADWF was differentiated as it was based upon collection system flow monitoring data period of record that differs from the IDWF.
- **Average Annual Flow/Load (AAF/AAL)** is the average flow or load that occurs over a calendar year. AAF and AAL were estimated based on the historical influent flow and load data from the City's WWTF.
- **Maximum Month Flow/Load (MMF/MML)** is the maximum 30-day running average influent flow observed at the WWTF during a calendar year. MMF and MML were estimated based on the historical influent flow and load data from the City's WWTF.
- **Peak Day Flow/Load (PDF/PDL)** is the maximum 24-hour average flow and load observed at the WWTF during a calendar year. PDF and PDL were estimated based on the historical influent flow and load data from the City's WWTF.
- **Peak Hour Flow (PHF)** is the highest observed hourly flow that occurs during the design storm. Wet weather inflow and infiltration (I/I) causes flows in the collection system to increase. PHF is typically used for designing sewers and lift stations. Therefore, the PHF and the collection system "Design Flow" are synonymous and will be used interchangeably throughout this Plan.

3.3 Collection System Flow Monitoring Results

The City contracted with ADS to conduct a temporary flow monitoring program within the City's sanitary sewer collection system. The purposes of the Flow Monitoring Program were to collect data for correlating real collection system flows with the hydraulic model's predicted flows, evaluate the system's capacity, and estimate basin I/I. The temporary flow monitoring data was collected from November 16, 2018, to March 18, 2019. The "Camas Flow Monitoring Report 2019" prepared by ADS summarizes the flow monitoring program and was submitted to the City as a stand-alone report. The report can be found as Appendix D - Temporary Flow Monitoring and RDII Analysis (ADS, 2019).

3.3.1 Average Dry Weather Flow Data

Average dry weather flow projections are derived from land use category data and corresponding wastewater flow factors. This method assumes that areas with similar land uses, such as low-density residential parcels, produce equivalent quantities of wastewater flow on a per area basis. System-wide flows can be compared to recorded flows obtained from temporary collection system flow monitors, or from the treatment plant influent flow meter to verify accuracy. This method of estimating base flows is an industry standard providing sufficiently accurate data for planning purposes.

3.3.1.1 ADWF Development

Existing ADWFs for each basin were estimated using data from the Camas flow monitoring report for each of the flow monitoring basins. ADWF was then developed using the driest days from the flow monitoring period based on the following set of minimum criteria:

- Less than 0.1 inch of rain in the previous day.
- Less than 0.4 inches of rain in the previous 3 days.
- Less than 1.0 inch of rain in the previous 5 days.
- In addition, those dry days that exhibited unusual flow patterns were not used to generate net dry day flow values for a basin.

Characteristic dry weather 24-hour diurnal flow patterns were developed for each basin from hourly data. The hourly flow data were also used to calibrate the hydraulic model for the observed dry weather flows during the flow monitoring period. Hourly patterns for weekday and weekend flows vary and were separated to better define dry weather flow. An example of the dry weather flow diurnal patterns from Flow Meter 5-1-1, are shown in Figure 3.1.

Carollo Engineers, Inc. (Carollo) estimated the average weekday and weekend dry weather levels and velocities at each site from the data provided by ADS for use in the model calibration process.

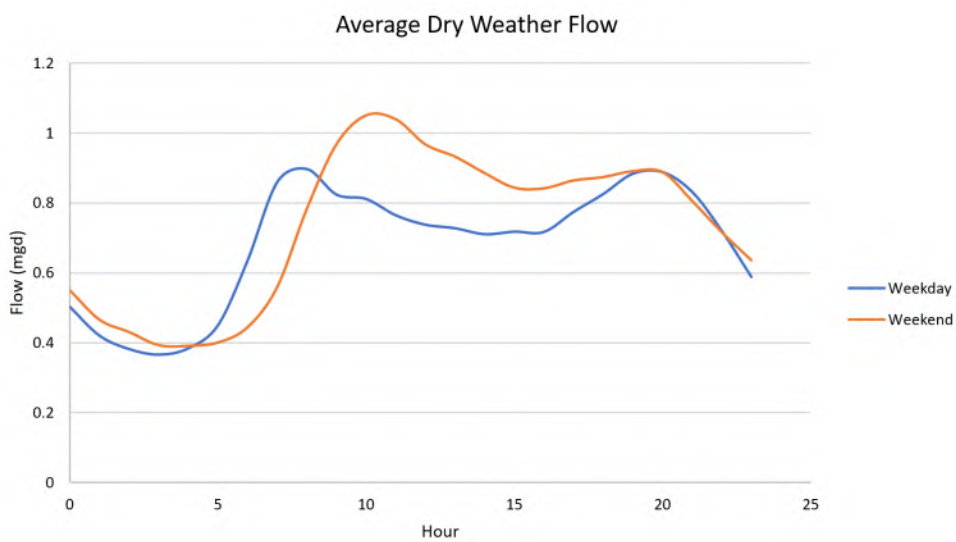


Figure 3.1 Typical Weekday vs Weekend Dry Weather Flow Variation (Meter 5-1-1)

Further detail on dry weather flow (DWF) development can be found in Appendix E - Hydraulic Model Development (Carollo, 2020).

3.3.2 Rainfall Data

An important part of the flow monitoring program is the collection and analysis of rainfall data. Three significant rainfall events occurred during the flow monitoring period, as well as other minor events. The storms recorded during this period caused an I/I response in the collection system, therefore were appropriate for I/I analysis and model calibration purposes. Further detail on the three storms used to calibrate the model can be found in Appendix E - Hydraulic Model Development (Carollo, 2020).

3.3.3 Wet Weather Flow Data

The flow monitoring data were also evaluated to determine how the collection system responds to wet weather events. As mentioned above, the flow monitoring program captured three main rainfall events. The rainfall event that occurred on December 23, 2018, was associated with the largest rainfall dependent infiltration and inflow (RDI/I) response during the flow monitoring period and is the most appropriate to be used for RDI/I analysis.

Figure 3.2 shows an example of the wet weather response at Meter 5-1-1 during the December 23, 2018, rainfall event. This figure also illustrates the volume of RDI/I that entered the system from the collection system upstream of Meter 5-1-1. The light grey line represents the

ADWF, while the green line represents the measured flow during the storm event. As can be seen in the figure, the flow increased by 4 to 8 times ADWF due to RDI/I entering the system during the wet weather events.

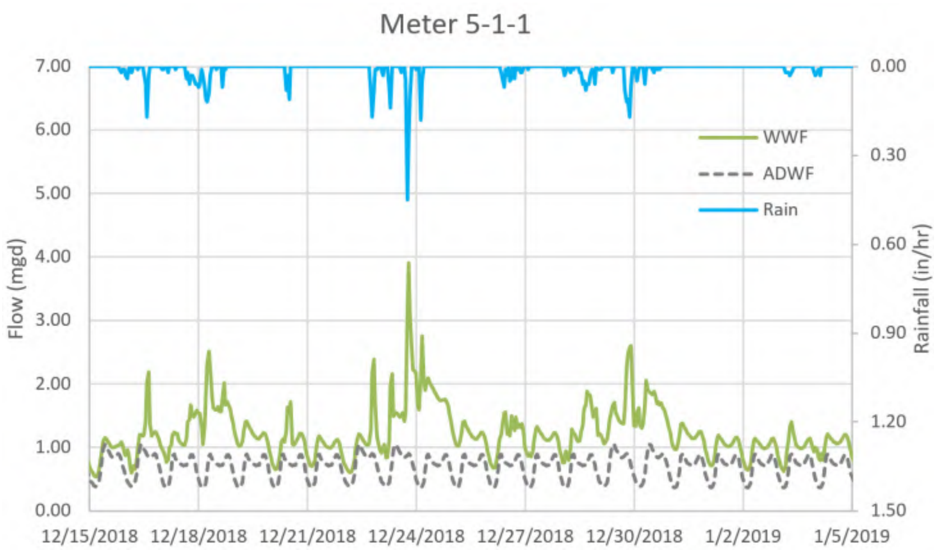


Figure 3.2 Example Wet Weather Response (Meter 5-1-1)

3.4 Collection System Flow Projections

Wastewater collection systems has several distinct flow sources based on the contributors in the service area:

1. Residential flow and base infiltration.
2. Commercial and industrial flow.
3. Wet weather I/I.

The flow from these sources have been grouped into these categories based on typical analytical procedures and the availability of information for each source. Residential flows include contributions from single family homes and multifamily units. The Washington State Department of Ecology (Ecology) issues discharge permits for the City's large industrial customers since the City does not have a pretreatment program in place. Wet weather I/I is caused by rainfall events and includes contributions from connected impervious areas such as roof drains and catch basins (inflow), and groundwater (infiltration) leaking into the collection system. The sum of these components is the complete flow through the collection system into the WWTF.

The flows throughout the collection system were estimated using the calibrated hydraulic model to predict dry and wet weather flows, as presented in Appendix E - Hydraulic Model Development (Carollo, 2021).

3.4.1 Sewered Population

Population projections are determined from the *2035 Comprehensive Plan*, the *Water SystemPlan* (Carollo Engineers, 2016), and the North Urban Growth Area Buildout Memo (BergerABAM, 2014), which are summarized by year in Table 3.1. Additional details on the methods for population projection are available in Appendix E - Hydraulic Model Development (Carollo, 2021).

Table 3.1 Population Summary

Year	Population Projections	Source
2020	26,065	(1) (2)
2035	36,000	(3)

Notes:
(1) Population data from the Comprehensive Plan was provided for 2015.
(2) The 2020 population was taken from April 2020 census data. https://www.census.gov/quickfacts/fact/table/camascitywashington/PST045219.
(3) Population data from the Water System Plan and the North Shore Population Estimate Memo was provided for 2035. Half of the North Shore area was assumed to be developed.

3.4.2 Land Use

Land use designations and regulations provide important information for evaluating sewer system capacity. Existing and future land use information is an integral component in projecting wastewater generation within the service area. The type of land use in an area will affect the volume of the wastewater generated. Adequately estimating the generation of wastewater from various land use types is important in sizing collection system facilities.

The City has six major land use categories for parcels within the UGB, as shown in Figure 3.3, which are sub-divided into the nine categories used in the *2035 Comprehensive Plan*. Acreage totals for each land use category are summarized by acreage in Table 3.2.

Table 3.2 Comprehensive Plan Land Use Summary

Comprehensive Plan Designation	Total Acreage(1)
Single Family High	425
Single Family Medium	3,617
Single Family Low	871
Multi Family High	246
Multi Family Low	279
Commercial	992
Industrial	2427
Parks(2)	851
Open Space/Green Space	492
Gross Total	10,200
Rights-of-Way and Stormwater Facilities	-27.7%(3)
Net Total	7,375

Notes:
(1) Total area within each comprehensive plan designation within the urban growth boundary.
(2) Applies only to land held in public trust.
(3) Based on typical County infrastructure deduction used in Clark County Buildable Lands Report.

Maps of the City's existing and future land use within the Service Area were developed with data provided by the City's Planning Department. Existing development information was taken from zoning data. Additional details on developing flows by land use type can be found in Appendix E - Hydraulic Model Development (Carollo, 2020).

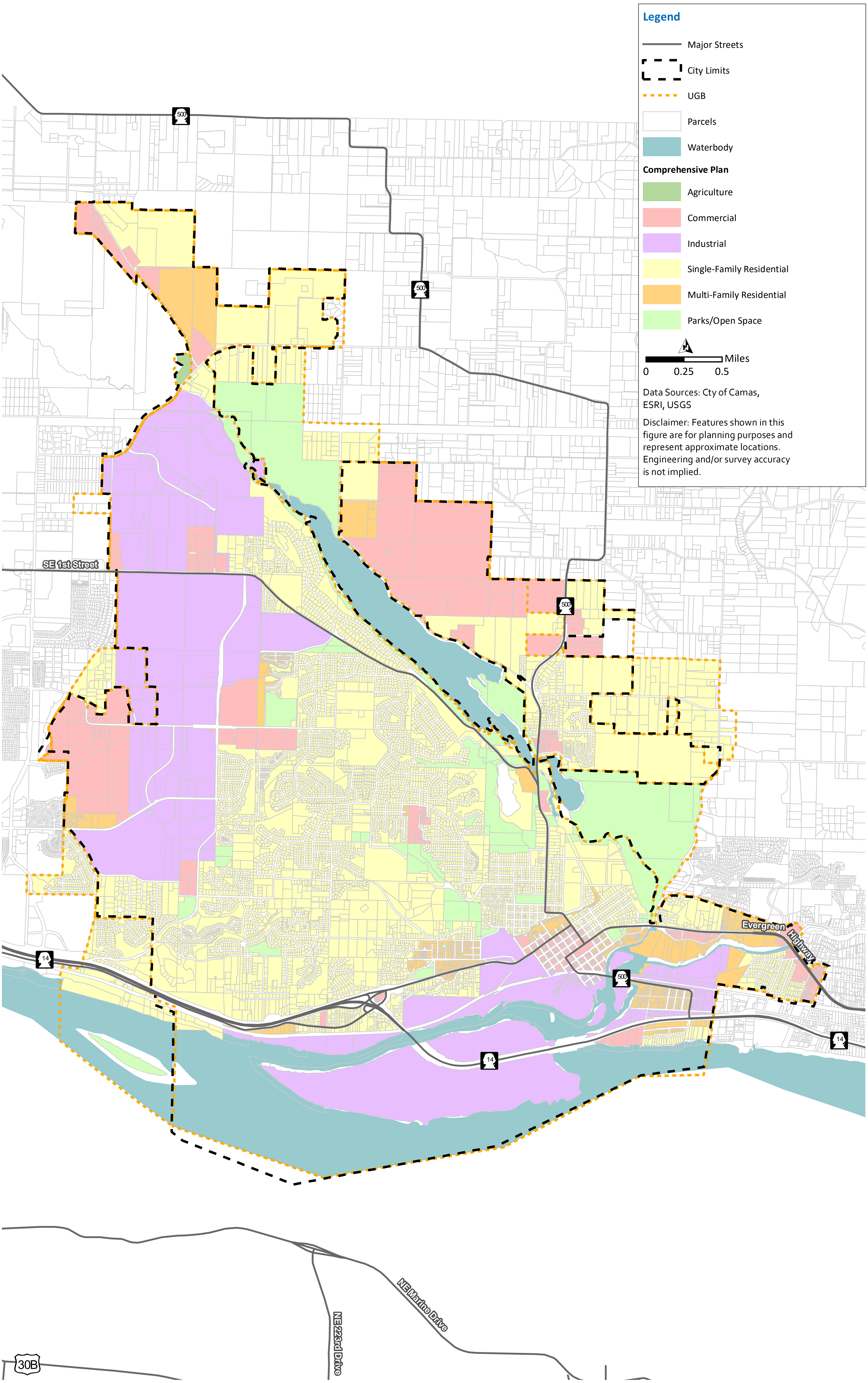


Figure 3.3 Land Use

3.4.3 Wastewater Flow Factors

Relationships between land use and wastewater generation were developed to project wastewater flows and allocate future flows to the collection system. These relationships, called wastewater flow factors, are established based on the average wastewater flow generated for each existing land use type. The land use flow factors were established to project the estimated ADWF through future development of the City's wastewater collection system and project future flows within the Study Area boundary.

Average wastewater flow coefficients are volume rates, usually expressed in gallons per acre per day (gpad), applied to either gross or net acres to calculate average day flow generated from a particular land use. A flow coefficient was developed for each of the land use classifications that were discussed in Section 3.4.2. The flow coefficient provides a means to transform a land use category from acreage into wastewater flow. The resulting flow is then applied to the appropriate sewer area in the sewer system model. Wastewater flow coefficients for residential areas typically range between 500 to 3,000 gpad, and commercial or industrial areas might range from 1,000 to 4,000 gpad, with typical values averaging approximately 1,500 gpad. Land uses designated as open space and parks are assumed to generate negligible amounts of sewage flow, and as a result have a flow coefficient of zero. Additional detail on the development of these flow factors is provided in Appendix E - Hydraulic Model Development (Carollo, 2021). Table 3.3 summarizes the flow factors used to project dry weather flows.

Table 3.3 Wastewater Flow Factor Development Summary

Land Use Type	Developed Area (acres)	Wastewater Flow Factor (gpad)	Existing ADWF (mgd)
Single Family Low	95	450	0.04
Single-Family Medium	693	670	0.46
Single Family High	22	800	0.02
Multi-Family Low	11	1,250	0.01
Multi-Family High	123	1,520	0.19
Commercial	110	1,270	0.14
Industrial	98	1,000	0.10
Agriculture	0	0	0.00
Park/Open Space	117	0	0.00
		Total Estimated Existing ADWF	**0.96**
		Measured Existing ADWF	**0.97**
		Percent Difference	**-0.2%**

3.4.4 Industrial Customer Flows

The City currently has three major industrial customers which must submit industrial discharge monitoring reports to Ecology for various flows, constituents, and characteristics as a condition of their discharge permits. The collective AAF from these contributors is 0.92 million gallons per day (mgd) with a PDF of 1.1 mgd as shown in Table 3.4. These flows can represent a large portion of influent flows for the WWTF. Flow data was taken from available DMR data from 2017 to 2022, as reported to and recorded on the Department of Ecology's Water Quality Permitting and Reporting Information System (PARIS).

Table 3.4 Industrial Customer Flows

Industry	MDF (gpd)	PDF (gpd)	AAF (gpd)
Wafertech Industries	525,000	737,000	629,408
Analog Devices	222,100	381,697	288,812
nLIGHT	156	9,971	3,014
All Flows	747,256	1,128,668	921,234

Notes:
Abbreviations: gpd – gallons per day; MDF - minimum daily flow.

3.4.5 Hydraulic Model Dry Weather Flow Projections

Developing an accurate estimate of the future quantity of wastewater generated at buildout of the collection system is an important step in sizing sewer system facilities for future scenarios. To estimate ADWF for specific areas, such as individual wastewater basins, dry weather flows are typically estimated based on the area contributing to flows and flow factors developed for each land use type. This method is developed based on the assumption that areas with similar land uses, such as low-density residential parcels, produce equivalent quantities of wastewater flow. System-wide flows can be compared to known flows at flow monitors, or at the treatment plant to verify accuracy of planning flow factors based on current development and measured flows. This method of estimating base flows is an industry standard for planning and provides sufficiently accurate data for planning purposes. Table 3.5 outlines the projected ADWFs for each flow monitoring basin for current, 2035, and buildout conditions.

Table 3.5 ADWF Projections for Hydraulic Modelling

Flow Meter Basin	Existing ADWF (mgd)	2035 ADWF (mgd)	Buildout ADWF (mgd)
Basin 5-1-1	0.53	1.25	2.12
Basin 5-1-2	0.15	0.25	0.38
Basin 10-10-12	0.17	0.19	0.22
Basin 8-1-1	0.12	0.13	0.13

3.4.6 Design Storm

Design storms are rainfall events used to analyze the performance of a collection system during peak flows and volumes and have a specific recurrence interval and rainfall duration. The design storm is used for sizing projects. The National Oceanic and Atmospheric Administration (NOAA) publishes isopluvial (rainfall contour) maps[1] that approximate the total rainfall depth for a range of storm size recurrence intervals for standardized storm durations.

The first step in the development or selection of the design storm is to define its recurrence interval and rainfall duration. The recurrence interval is based on the probability that a given rainfall event will occur or be exceeded in any given year. For example, a "100-year storm" means there is a 1 in 100 chance that a storm as large as, or larger, than this event will occur at a specific location in any year. Duration is the length of time in which the rainfall occurs.

[1] Miller, J., R. Frederick, and R, Tracey. Precipitation-Frequency Atlas of the Western United States, Volume IX-Washington. Washington DC, NOAA 1973.

Discrete storm events are established based on the period of time that there is no rainfall between rain events. A 20-year recurrence interval is recommended to match the pump station life cycle sizing in Ecology's Criteria for Sewage Works Design book (Orange Book); therefore the collection system must also be able to convey a 20-year storm.

The NOAA information is based on older data and does not provide a hydrograph corresponding to the accumulated rainfall. To find a suitable storm hydrograph, a statistical analysis on historical rainfall records recorded by the City and other nearby gauges was conducted. 20-year rainfall records from the City's HYDRA Rainfall Network and a 60-year record from the Portland International Airport were used to select a 20-year occurrence rainfall event on December 6, 2015. This storm had 3.37 inches of rainfall in 24 hours, which was consistent with 20-year recurrence intervals from other regional rain gauges. However, we will refer to this event as a 10-year design storm as it aligns with a 10-year recurrence defined by NOAA.

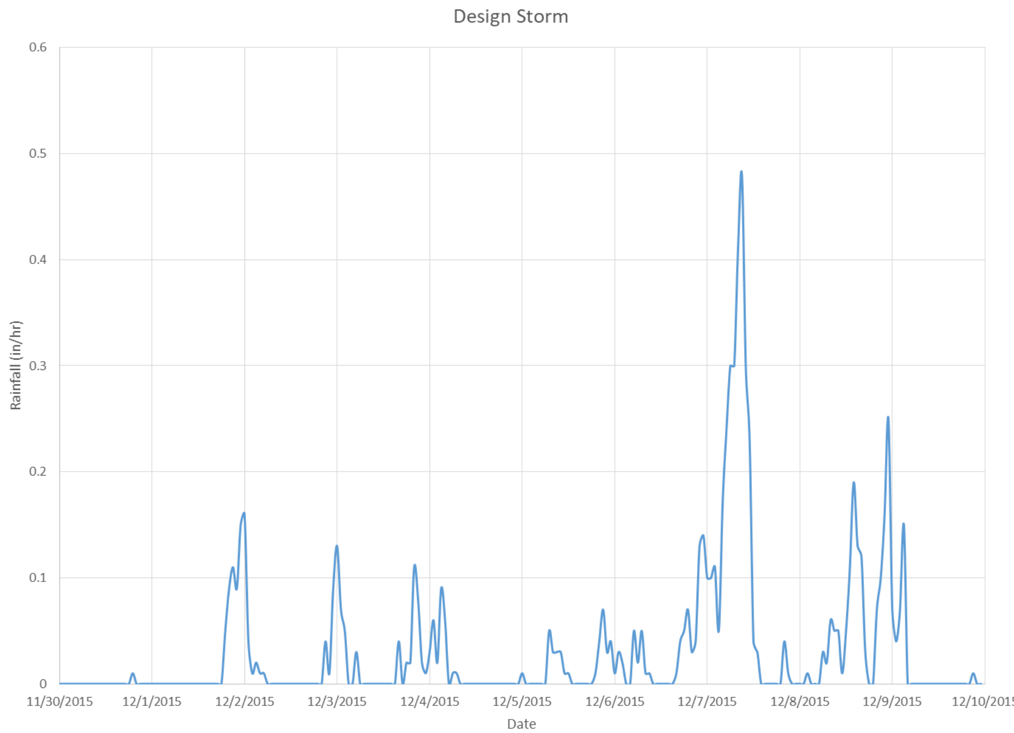


Figure 3.4 Design Storm Hyetograph

3.4.7 Hydraulic Model Wet Weather Flow Projections

To predict future Peak Wet Weather Flow (PWWF), I/I in the future service area must be defined. It is assumed that maintenance will keep up with system degradation, so no net change in I/I was used for future modeling scenarios within the existing service area. Additional area was added to the model for future scenarios in the North Shore that will add additional I/I flows into the system. The North Shore scenarios used the calibrated I/I parameters from Basin 8-1-1, as Basin 8-1-1 has a low I/I response indicative of recent construction. This corresponded to an I/I flow rate of 2000 gpad. Table 3.6 outlines the projected PWWF's for each flow monitoring basin for current, 2035, and buildout conditions. To properly convey the flows throughout the system to find the true peaks, significant upsizing was done on the piping and pump station capacity to eliminate hydraulic restrictions.

Table 3.6 PWWF Flow Projections for Hydraulic Modelling

Flow Meter Basin	Existing PWWF (mgd)	2035 PWWF (mgd)	Buildout PWWF (mgd)
Basin 5-1-1	4.63	11.38	12.76
Basin 5-1-2	0.39	1.51	1.66
Basin 10-10-12	0.54	0.56	0.59
Basin 8-1-1	0.43	0.44	0.44

3.4.8 Hydraulic Model Flow Projections Summary

Table 3.7 presents the total projected ADWF and PWWF for the three planning periods for the modeled portion of the system (gravity and Septic Tank Effluent Pump [STEP] that is upstream of gravity). The table also includes the ratio between PWWF to ADWF, called the Peaking Factor, which ranges from 5.7 to 8.2.

Table 3.7 Flow Projections Summary

Planning Horizon	ADWF (mgd)	PWWF (mgd)	Peaking Factor (PWWF:ADWF)
2018	0.80	5.45	6.8
2035	1.63	13.33	8.2
Buildout	2.63	14.86	5.7

3.5 WWTF Flow and Load Projections

The City's WWTF receives flows from the gravity collection system, septic tank effluent, and the septage receiving station. The sum of these flows is greater than the collection system flow projections because that analysis only focused on the portion of the system included in the hydraulic model and did not include septic tank flows, which make up to 50 percent of the total influent flow. Thus, load and peak hour flow projections were developed independently for the WWTF based on measured influent flows and wastewater characteristics, typical septage and STEP system characteristics, and population growth projections. The City expects that half of additional plant flow from population growth within the service area will come from the gravity sewer system, while the other half of the additional flow will come from the STEP system.

The influent flow projections developed for the WWTF are summarized in Table 3.8. Note that the 2035 PHF projection was developed by multiplying the projected PDF of 10.8 mgd by a diurnal peaking factor of 1.25 recorded during a peak flow event in February 2017. Additionally, it is assumed that no additional flow enters the collection system due to inflow and infiltration (I/I) as the City mitigates existing sources of I/I and installs new sewer and STEP system connections which do not contribute to overall I/I.

Table 3.8 WWTF Influent Flow Projection

Flow Parameter	2021 Flow (mgd)	2035 Flow (mgd)
ADWF	2.2	3.4
AAF	2.8	4.0
MMF	4.8	6.2
PDF	8.4	10.8
PHF	10.0	13.5

Wastewater loading data are important for sizing several critical treatment processes. The wastewater loading components of principal interest are the 5-day biological oxygen demand (BOD_5), the total suspended solids (TSS), and ammonia (NH4). Influent loading was projected using the same method described for influent flow projections. Historical values for BOD_5, TSS, and NH_3 and projections to 2035 are detailed in Table 3.9 and Figure 3.5 below.

Table 3.9 Current and Projected WWTF Loads

Load Parameter	2021 Load (ppd)	2035 Load (ppd)
Sewered Population[(1)]	18,900[(1)]	36,000
BOD_5 (ppd)		
Average Annual	2,400	6,000
Max Month	3,300	8,200
Max Week	4,300	10,600
Peak Day	5,300	13,000
TSS (ppd)		
Average Annual	2,400	6,300
Max Month	3,300	10,500
Max Week	4,300	17,000
Peak Day	5,300	19,300
Ammonia (ppd)		
Average Annual	900	1,400
Max Month	1,100	2,000
Peak Day	1,800	4,300

Notes:
(1) Current sewered population is based on 2035 Comprehensive Plan.

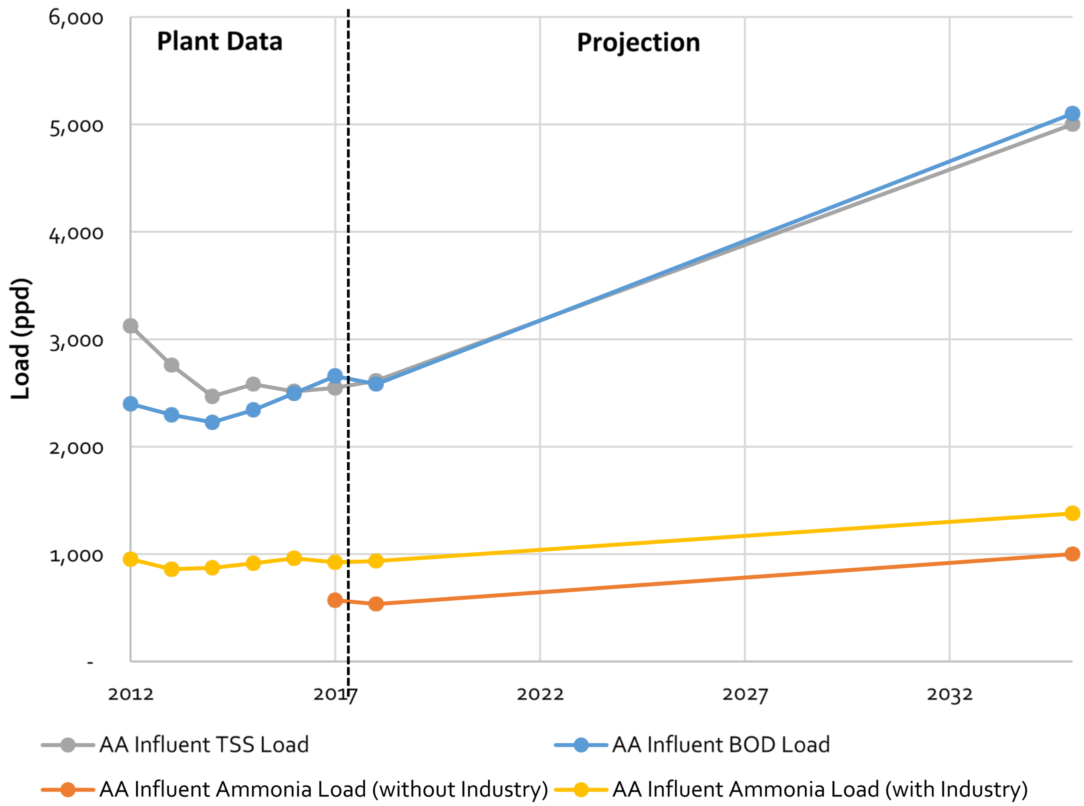


Figure 3.5 Current and Projected WWTF Loads

Chapter 4

EXISTING SYSTEM

4.1 Introduction

The purpose of a sewage collection system is to adequately convey sewage to locations where it can be treated and safely discharged. This chapter describes the City of Camas's (City's) existing sewer collection system, adjacent sewer service areas, and wastewater treatment facility (WWTF). The City's collection system utilizes both conventional gravity sewer with lift stations (LS) as well as Septic Tank Effluent (STE) Pumping Stations (STEP), Septic Tank Effluent Filter Systems (STEF), and Septic Tank Effluent Gravity Systems (STEG) to convey wastewater to the WWTF. These systems are influenced by the natural environment, critical areas, and the service area which are summarized in this Chapter.

This chapter will serve as the framework on which to base the General Sewer Plan (Plan), which was last updated in 2010. These considerations establish the basis of planning for the demographic and system analysis which will be the framework for identifying potential for development within the established service area. Consideration for the adequacy of the system to serve the anticipated development within the service area study boundaries is also reliant upon existing system characteristics.

4.2 Sewer Service Area

The City's service area is shown in Figure 4.1. The service area contains approximately 7,400 acres. The current service area includes the City limits and the future service area extends to the Urban Growth Area (UGA). Adjacent sewer systems include City of Vancouver, the Discovery Clean Water Alliance (CWA), and City of Washougal. These systems are described in greater detail in Section 4.5.

4.3 Collection System

The City's sewer system is comprised of four major facility types:

1. Conventional Gravity Sewer.
2. STE Systems.
3. STEP Transmission Mains.
4. Lift Stations (LS) with Force Mains.

The conventional gravity sewer system is the most common sewer conveyance method in the region and relies on a downward slope throughout the profile to convey flow to a WWTF or intermediate LS. In addition to the conventional gravity sewer system and LS, three STE systems are utilized in the City's collection system: STEF, STEG, and STEP, which are explained in further detail in Section 4.3.2. Twenty-nine LS are located within the service area which convey sewage and STE for treatment where gravity sewers are not effective. Properties within the sewer service area outside of the gravity sewer portion of the City's collection system use on-site septic tank systems which provide some wastewater treatment, solids settling, and digestion.
Similar to LS, STEP systems allow service where gravity systems may not be effective, or which were originally located outside the public boundaries of a public sewer system service area.

Figure 4.2 and Table 4.1 below details the pipe infrastructure in the City's system by sewer type. As previously mentioned, the infrastructure is predominantly gravity sewer and nearly half of the City's pipelines serve STE systems.

Table 4.1 Summary of Pipe Infrastructure by Type

Sewer Type	Pipe Length (feet)	Pipe Length (miles)
Gravity Main	236,200	44.7
Force Main	38,260	7.2
STEP Main	255,070	48.3
STEP Bypass Main	8,040	1.5
Total	**537,570**	**101.8**

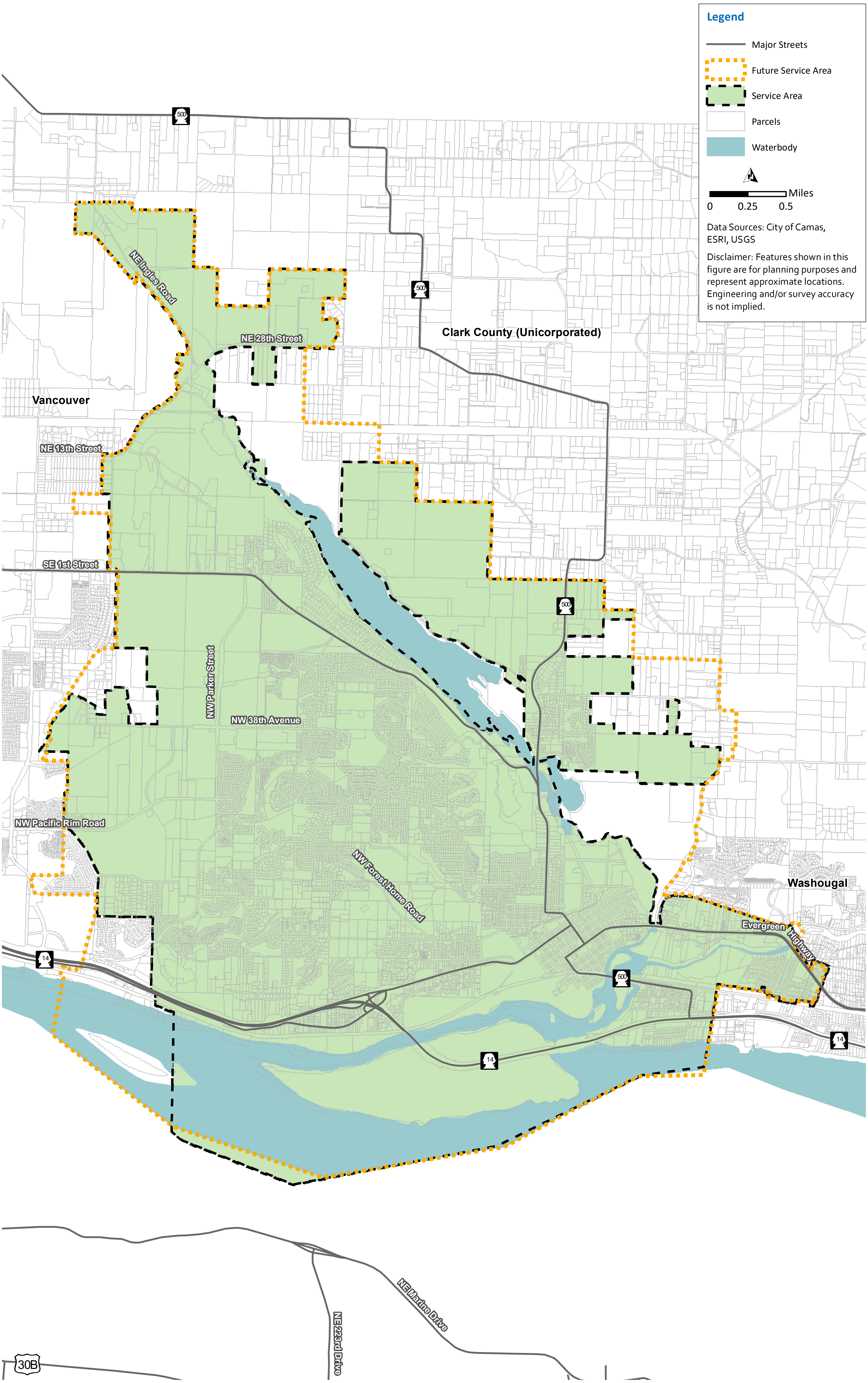


Figure 4.1 Sewer Service Area

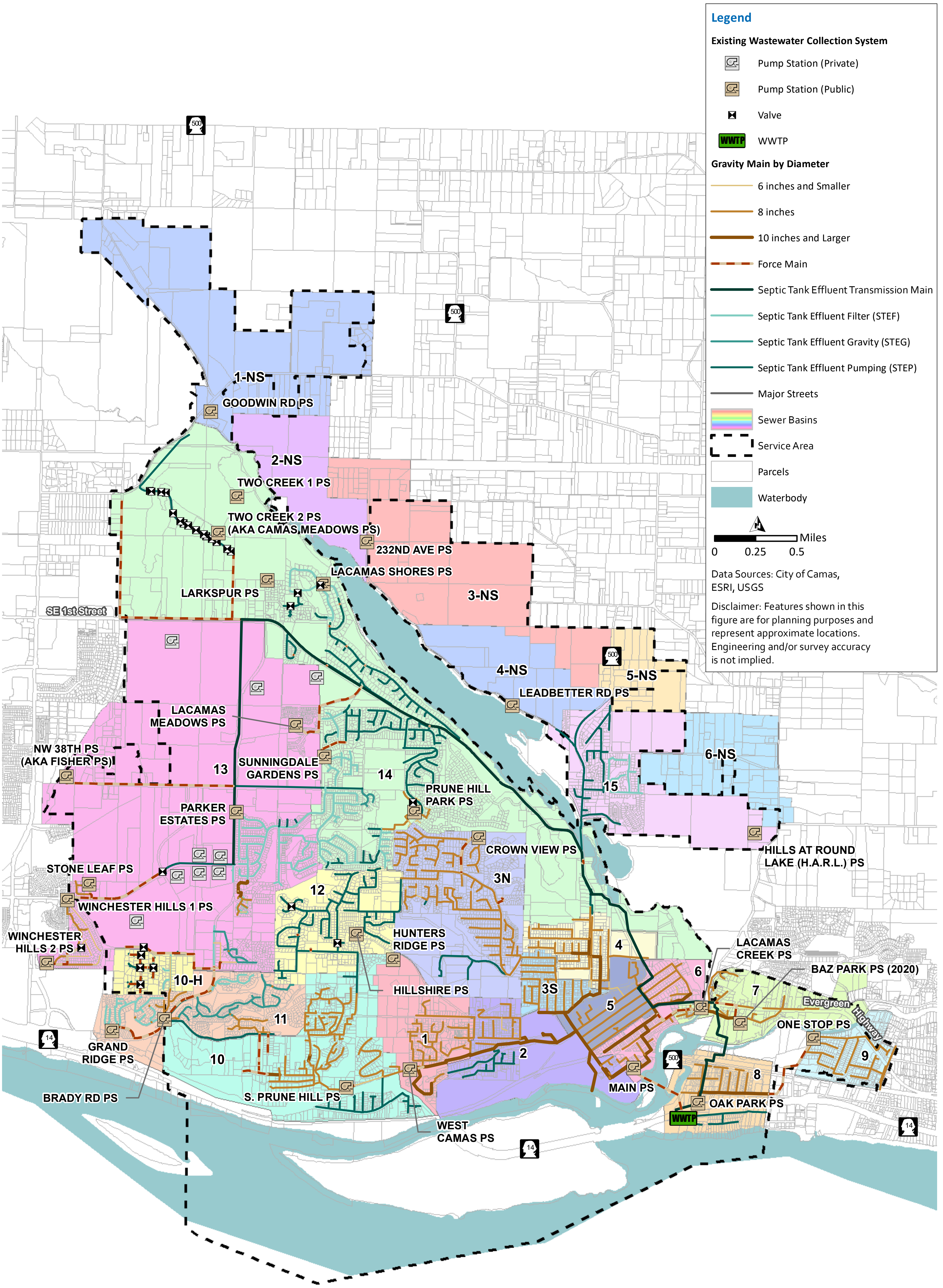


Figure 4.2 Existing Wastewater Collection System

4.3.1 Gravity System

Portions of the system served by conventional gravity sewers date from its beginning in the 1920's and includes the following basins identified in Figure 4.2: Downtown, Oak Park, Parkers Landing, basins along the Columbia River and State Route (SR) 14, and portions of Prune Hill. The North Shore area is and will continue to be served from conventional gravity sewers. Properties served by STE systems are located on the northern and western sides of the City.

The earliest portions of the gravity sewer system was constructed with vitrified clay pipe (VCP). Much of this VCP was later replaced with cast iron, concrete, and eventually polyvinyl chloride (PVC). Therefore, the relative age of sanitary sewer can be identified by the material type. The system utilizes a pipe diameter ranging from four inch to 24-inch segments where the majority of the system is eight inches or less in diameter. A summary of pipe infrastructure by diameter is shown in Table 4.2.

Table 4.2 Summary of Gravity Sewer Infrastructure by Size

Pipe Diameter (inches)	Pipe Length (feet)	Pipe Length (miles)
4	40	0.01
6	13,760	2.6
8	191,920	36.3
10	9,380	1.8
12	9,640	1.8
15	2,610	0.5
18	3,570	0.7
21	3,140	0.6
24	1,150	0.2
27	980	0.2

4.3.2 STE Systems

Starting in the 1985, the City required new customers in the western portion of the service area to be served using the STE system. Due to the City's topography and shallow bedrock, the STE systems allowed the City to serve areas without the costly installation of gravity sewers. The three STE systems address site specific challenges within the City's collection system. STEP systems consist of a septic tank equipped with a pump at the outlet to convey effluent flows to the STEP transmission main, rather than an on-site drain field. STEG systems consist of a septic tank with an outlet that conveys effluent flows by gravity to the STE transmission main. STEF systems utilize a siphon to convey effluent flows to the STE transmission main. Figure 4.2 shows the STEF, STEG, and STEP systems and STE transmission mains within the City's conventional gravity collection system.

The City owns and maintains residential STE systems. The City pumps out the septage from the STE systems on a five-to-seven-year cycle. Commercial and Industrial systems are owned and maintained by the property owner. The City receives and treats septage from both systems at the WWTF.

Table 4.3 Summary of STE Infrastructure by Size

Pipe Diameter (inches)	Pipe Length (feet)	Pipe Length (miles)
Unknown	40	0.01
1	1,880	0.4
2	50,235	9.5
3	9,740	1.9
4	23,680	4.5
6	57,440	10.9
8	40,980	7.8
10	25,950	4.9
12	320	0.06
18	2,450	0.5
21	230	0.04

4.3.3 STEP Transmission Main

The STEP transmission main is a transmission main that conveys STE system flows and major industrial dischargers to the WWTF. The pressurized transmission main is shown in Figure 4.2, The STEP main is approximately 36,970 linear feet in length and is 21-inches to 24-inches in diameter. The transmission main conveys flows directly to the WWTF without receiving flows from the other sewer systems.

4.3.4 Lift Stations

The City currently operates twenty-nine LS, whose characteristics are summarized in Table 4.4. Of these twenty-nine LS, thirteen serve the gravity system and fifteen serve the STE systems. One LS is dedicated to odor control. The LS are identified in Figure 4.2. There are approximately 51,460 ft, or 9.7 miles, of force main associated with the LS ranging from 4-inches to 18-inches in diameter. The majority of LS serve relatively small service areas and have capacities less than 500 gallons per minute (gpm). The Main LS, with a capacity of 7,700 gpm station, conveys the majority of the gravity system to the WWTF through an 18-inch diameter force main under Lacamas Creek.

Table 4.4 Summary of Lift Stations

	Lift Station	Location	Basin Number	STE or RAW	Quantity of Pumps	Pump Motor Size (HP)	Pump Capacity (gpm, ea.)	Total Station Capacity (gpm, 1 standby)	TDH (feet)
1	232nd Avenue	Near 618 NE 232rd Avenue	2-NS	RAW	2*	15.2	365	365	87
2	Baz Park	1906 NE 3rd Loop	7	RAW	2	7.5	488	488	38
3	Brady Road	919 NW Brady Road	11	STE	2	35	511	511	60
4	Camas Meadows	6902 NW Morgan Way	14	STE	2	35	221	221	222
5	Crown View	3222 NW Ivy Lane	3	RAW	2	20	222	222	124
6	Fisher	5870 NW 38th	13	STE	2	23	126	126	206
7	Goodwin Rd	2305 NE Goodwin Road	1-NS	RAW	2*	15.2	300	300	94
8	Grand Ridge	843 NW Grande Ridge Road	11	STE	2	11	133	133	160
9	Hills at Round Lake (HARL)	1960 NE Tanoak Drive	15	STE	2	11	256.9	256.9	93.2
10	Hillshire	2303 NW Artz Court.	12	RAW	2	10	175	175	70.1
11	Hunters Ridge	2021 NW 17th Avenue	1	RAW	2	23	152	152	174
12	Lacamas Creek	1641 NE 3rd Avenue	7	RAW	2*	25	950	950	67
13	Lacamas Meadows	3263 NE 45th Avenue	13	STE	2	23	173	173	203
14	Lacamas Shores	6230 NW El Rey Drive	14	STE	2	23	195	195	168
15	Larkspur	6162 NW Larkspur	14	STE	2	23	264	264	154
16	Leadbetter Rd	1050 SE Leadbetter Road	4-NS	RAW	2*	26.6	605	605	111
17	Lower (aka South) Prune Hill	2381 NW 6th Place	10	RAW	2	10	600	600	39
18	Main Station	480 SE 3rd Avenue	5	RAW	3	125	3850	7700	85
19	Oak Park	907 SE Polk Street	8	RAW	2	10	350	350	57
20	One Stop	200 SE Yale	9	RAW	2	5	231	231	36.2
21	Parker Estates	3436 NW Parker	13	STE	2	20	339	339	103
22	Prune Hill Park	3403 NW Sierra Drive	14	STE	2	7.5	350	350	53
23	Stone Leaf	5713 NW 26th Avenue	13	STE	2	23	423	423	81.2
24	Sunningdale Gardens	4043 NW Dahlia Loop	14	STE	2	10	260	260	63
25	Two Creeks	7402 NW Morgan Way	14	STE	2	10	166	166	70.7
26	West Camas	1625 NW 6th Place	1	RAW	2	30	1000	1000	74
27	Winchester Hills 1	19617 SE 34th Street	13	STE	2	6.5	97.9	97.9	66.7
28	Winchester Hills 2	19320 SE 42nd Circle	13	STE	2	5	125	125	65
29	Remote Odor Control Station	325 NE 23rd Avenue	14	N/A	N/A	N/A	N/A	N/A	N/A

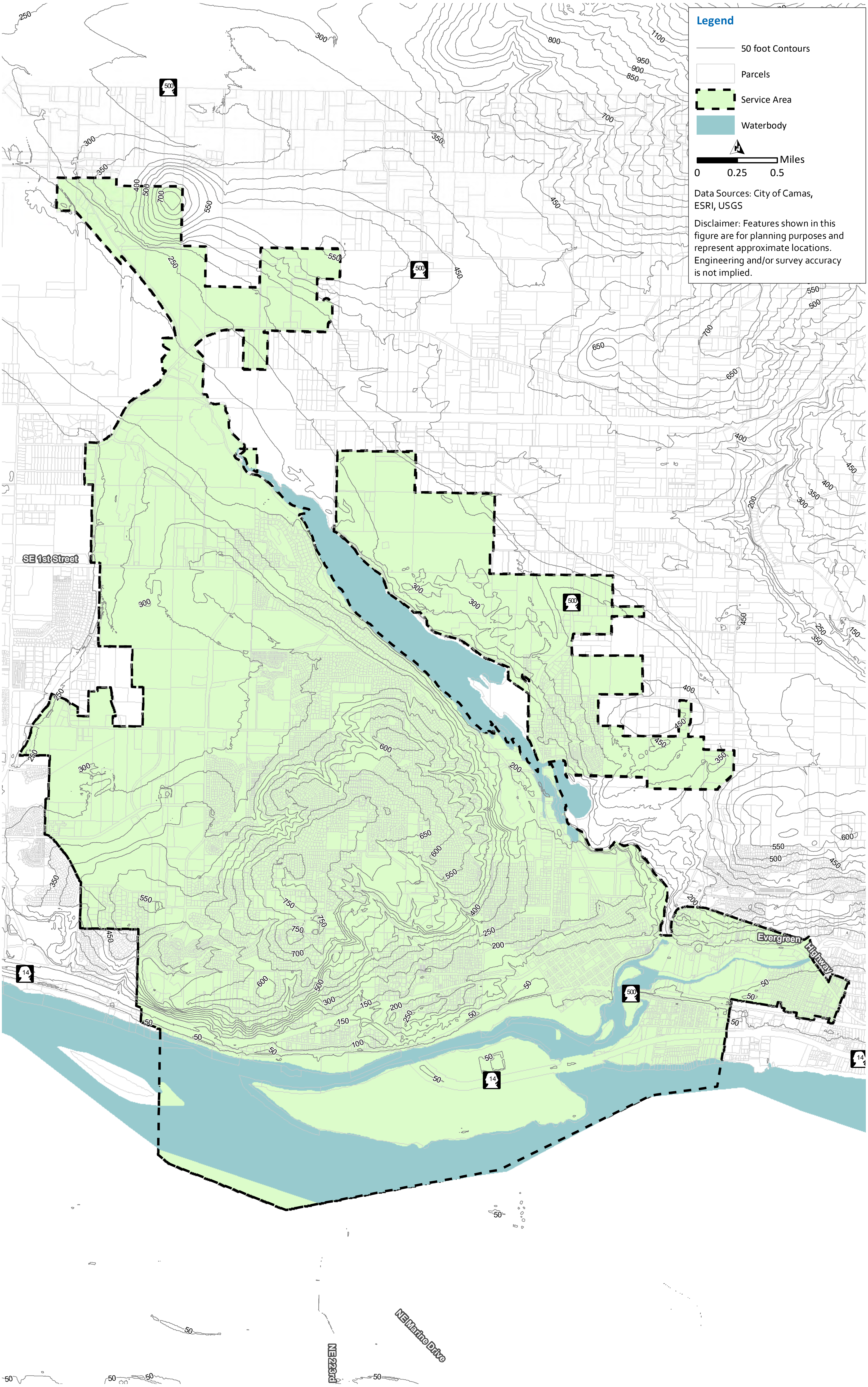


Figure 4.3 Topography

4.4 Wastewater Treatment Facility

The City's WWTF is located along the Columbia River in the southeastern portion of its sewer service area. The WWTF was originally constructed in 1972 and has had several modifications since that time. The first major upgrade and expansion of liquid stream processes was completed in February of 2000. A subsequent Phase 2A upgrade, primarily addressing solids treatment, including anaerobic digesters and sludge drying facilities, was completed in 2012. Phase 2B, completed in 2014 improved blower controls, added a third secondary clarifier, new effluent filters, and digester gas treatment facilities.

The facility process flow diagram is shown in Figure 4.4. An aerial view of the WWTF with each unit process and building identified is shown in Figure 4.5. The liquid stream treatment begins with climbing bar screens at the plant headworks to remove larger material which is washed, compacted, and disposed of at a landfill. Primary solids-liquid separation occurs in two circular primary clarifiers with the primary effluent discharging to a splitter box where it is combined with return activated sludge (RAS) from the secondary clarifiers (SC) and split between three aeration basins (ABs), where biomass is aerated to promote biological oxidation and improve water quality. Secondary treatment in the ABs consists of influent channel selector zones followed by two aerated and three anoxic zones to remove carbonaceous material and reduce ammonia concentrations. Magnesium hydroxide ($Mg(OH)_2$) is added at the SC splitter box to provide supplemental alkalinity.

Mixed liquor from the three ABs is combined and split between three secondary clarifiers. The three clarifiers provide separation of the biomass from the secondary treatment processes (termed activated sludge) and discharge of liquid effluent to two mechanical disc filters. Ultraviolet (UV) disinfection is provided in an open channel system with four banks of UV lamps prior to discharge to the outfall in the Columbia River.

The effluent either flows by gravity or is pumped to the outfall via the three effluent pumps, which are operated with two duty and one standby configuration. Transitions between gravity and pumped effluent flow are performed automatically when the pumps are placed in "auto" mode. When the Columbia River level rises, gravity effluent discharge is stopped by closing the flap gate in the effluent manhole. The existing outfall is a 36-inch corrugated metal pipe (CMP) and extends approximately 850 feet south into the Columbia River channel. The diffuser portion of the outfall is located along the outer 150 feet of the pipe and is equipped with 16 vertical risers, with each oriented vertically with rubber Tideflex check valve-type nozzles. The vertical risers discharge effluent perpendicular to the flow of the Columbia River.

Solids from the primary clarifiers are first conveyed to two hydro-cyclones and a classifier for degritting then thickened in the gravity thickener. Thickened primary sludge (TPS) is then pumped to anaerobic digesters. Solids from the secondary clarifiers are moved by a sludge-scraper mechanism to a wet well and then withdrawn by pumps. The settled solids (RAS) are pumped back to the aeration basin splitter box. Excess activated sludge wasted (WAS) from SC Number 3 is sent to a storage tank and thickened in a rotary drum thickener. Thickened primary and secondary solids are then combined in anaerobic digesters for stabilization, removal of volatile solids, and production of biogas. Dewatering of the digested sludge is accomplished through a centrifuge and then conveyed to a belt dryer, which evaporates most of the remaining water content in the biosolids. The dewatered and dried biosolids are dried to achieve Class A and are hauled off-site for land application. Odors are controlled at the plant through unit-specific odor control ductwork. The odorous air is then blown through a bark media biofilter.

The unit capacity for each major unit at the WWTF is summarized in Table 4.5.

Table 4.5 Unit Process Capacity

Unit	Number of Units	Design Criteria(1)
Bar Screens		
Climbing Bar Screens	2	• Perforation Size: 1/4 in (6 mm)
Manual Coarse Bar Screen (Bypass)	1	• Bar Spacing: 3/4 in (19 mm)
Primary Clarifiers	2	• Diameter: 60 ft (each) • Depth: 10 feet • Volume: 211,500 gallons
Aeration Basins	3	• Volume: 100,800 ft^3 (each)
Aerobic	3	• Total Volume: 176,400 ft^3
Anoxic	2	• Total Volume: 108,360 ft^3
Selector (SAx)	3	• SAx-1 Volume: 2,700 ft^3 • SAx-2 Volume: 1,600 ft^3 • SAx-3 Volume: 4,500 ft^3 • SAx-4 Volume: 9,000 ft^3
Secondary Clarifiers		
SC Number 1	1	• Diameter: 75 feet • Depth: 13 feet • Volume: 424,000 gallons
SC Number 2	1	• Diameter: 75 feet • Depth: 17 feet • Volume: 461,800 gallons
SC Number 3	1	• Diameter: 75 feet • Depth: 14 feet • Volume: 462,700 gallons
Effluent Disc Filters	2	• Capacity: 3.0 mgd (each)
UV Disinfection(1)	4	• Peak Day Process Flow: 10.04 mgd
Hydrocyclones	2	• Capacity: 220 gpm
Gravity Thickener	1	• Diameter: 30 feet • Depth: 10 feet
Anaerobic Digesters	2	• Volume: 24,500 ft^3 (each)
Centrifuge	1	• Capacity: 130 gpm
Rotary Screen Thickener	1	• Capacity: 100-300 gpm

Notes:
Abbreviations: ft^3 - cubic feet; mm - millimeter.

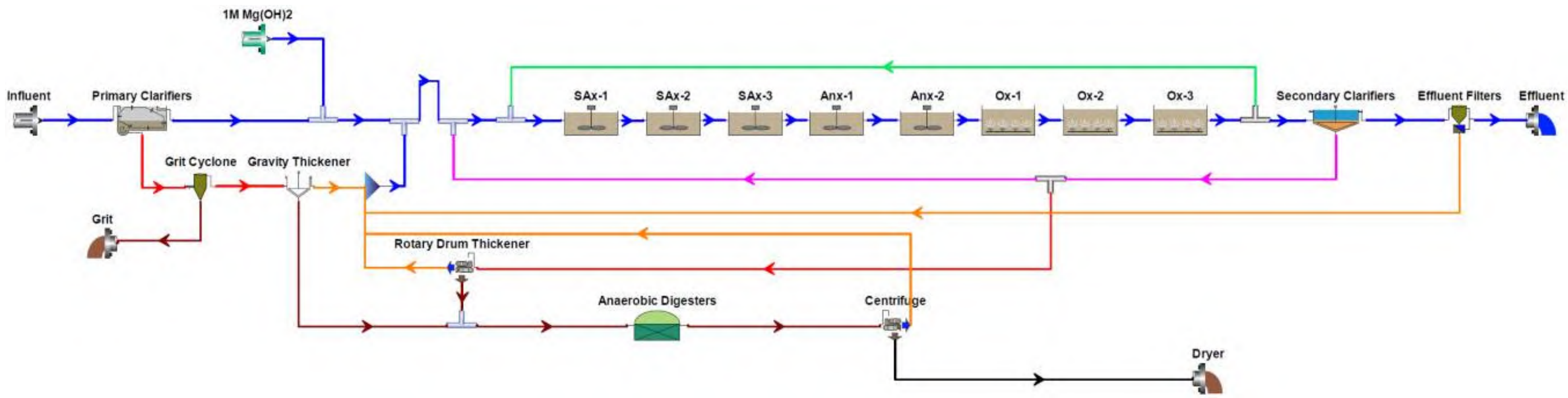


Figure 4.4 BioWin Process Flow Diagram

Figure 4.5 WWTF Aerial Image with Site Plan

4.4.1 Recent Plant Upgrades

As noted, several upgrades have taken place at the WWTF since the previous General Sewer Plan (Gray and Osborne, 2010), which have increased capacity and efficiency:

- **WWTF Improvements Phase 2A (2012):** Several improvements took place with this design to improve the following:
  - The addition of solids handling equipment which includes a rotary screen thickener, two anaerobic digesters, a waste gas burner, and sludge holding tank.
  - Modifications to headworks which includes the addition of Bar Screen No. 2 and Washer/Compactor No. 2.
  - Installation of the Plant Drain Pump Station No. 2, Biofilter No. 2, and the Septage/Centrate/ WAS Storage Tank.
  - Reduction to the height of the aeration basins (AB) and the addition of baffle walls within the selector zone.
- **WWTF Improvements Phase 2B (2014):** This project focused on modifications to the sludge storage area, the addition of Secondary Clarifier No. 3, modification of Secondary Clarifier No. 2, and addition of two effluent disk filters.
- **Installation of a Thermal Dryer (2012):** This allowed the facility to produce Class A Biosolids for land application.

Additionally, two studies have been completed focusing on assessing the condition of equipment. The WWTF and Pump Station Condition Assessment Report (HDR, 2018) recommended several improvements in the immediate term which include an odor control evaluation, polymer usage evaluation, replacement/upgrading grit hydrocyclones and classifiers, modeling of the AB's, blower filter replacement, a cross connection evaluation, supervisory control and data acquisition (SCADA) upgrade, replacement of variable frequency drive (VFDs) in the equipment building and plant effluent building, and replacement of pH and dissolved oxygen (DO) analyzers. An additional condition assessment was completed on the gravity thickener which identified six major components which were severely deteriorated as well as the conduit and wiring within.

4.4.2 Plant Flows

The WWTF receives influent flows from the Main and Oak Park pump stations and a septage truck unloading station. STEP flows in the collection system are conveyed to the plant through the Main and Oak Park pump stations. The combined flow from the pump stations and septage truck unloading station are measured by a Parshall flume. The combined flow measured by the Parshall flume is recorded as the WWTF influent flow.

The WWTF has a five-year average annual flow (AAF) of 2.8 mgd from the collection system with approximately 33 percent of the AAF from industrial users. This relatively high percentage of industrial users increases the influent ammonia concentrations but decreases the total suspended solids (TSS) and biochemical oxygen demand (BOD) concentrations resulting in a high nitrogen and low carbon influent compared to a typical municipal facility. The previously described STEP and STEF system which contributes nearly 60 percent of the average day dry weather influent flows also contributes to unique influent characteristics when brought into the facility due to an estimated 35 percent reduction of BOD in the 5-day test (BOD_5) and a 60 percent reduction of TSS in the septic tank. Although septic tank solids are also returned to the facility through septic delivery, these solids also have reduced BOD_5 and TSS loadings due to the nearly five-year detention time. National Pollution Discharge Elimination System (NPDES) effluent discharge limitations, prohibitions, and requirements are similar to other municipal facilities with standard 30/30 monthly TSS and BOD concentration limits with a mandatory 85 percent reduction in each. However, the WWTF has ammonia limits of 20 mg/L (NH_3 as N) in the summer and seven mg/L (NH_3 as N) in the winter.

4.4.3 NPDES Violations

The current NPDES permit was effective October 1, 2015, and expired September 30, 2020, but as of February 2022 the City is working with Ecology on an extension request. The plant has had few permit violations since issuance of the latest permit, with the last violation occurring in October 2019. These violations include minimum pH value, average monthly ammonia concentration, average weekly TSS concentration and load, and average weekly BOD_5 concentration and load. A list of permit violations is shown in Table 4.6. The violations in 2017 occurred due to a toxic slug introduced in the influent which reduced the viable mixed liquor population resulting in floating sludge and higher than expected discharge concentrations from the secondary clarifiers which overwhelmed the filters pushing a higher percentage of flow through the filter by-pass.

Table 4.6 Five-Year NPDES Permit Violation Summary

Violation Date	Type / Parameter	Measurement Value(2)	Effluent Limit(2)
October 2019	pH Daily Minimum	5.9	6 (min)
February 2018	Ammonia Winter(1) Monthly Average	13.2 mg/L	7 mg/L
February 2017	TSS Weekly Average	51.5 mg/L 3,532 ppd(2)	30 mg/L 1,525 ppd
February 2017	BOD_5 Weekly Average	41.2 mg/L 2,623 ppd	30 mg/L 1,525 ppd

Notes:
(1) Winter Ammonia limits apply to the months of October through May.
Abbreviations: mg/L - milligrams per liter; ppd - pounds per day.

4.5 Adjacent Sewer Service Areas

Four sewer service areas with their own WWTFs are within a 20-mile radius of the Camas WWTF. All of the facilities listed in Table 4.7 have Columbia River outfalls. Distances vary from the closest, Washougal WWTF, approximately 3.5 miles away, to the farthest, Salmon Creek WWTF, approximately 20 miles away.

Table 4.7 Adjacent Service Areas WWTFs

Facility/Service Area	MMF (mgd)(1)	Biological Treatment Process	Disinfection	Biosolids
Salmon Creek (Clark County)	10.3	Aeration Basins	UV	Land Applied
Marine Park (Vancouver)	16.1	Aeration Basins	UV	Incinerated
Westside (Vancouver)	28.3	Aeration Basins	UV	Incinerated
Washougal	2.2	Oxidation Ditch	UV	Lagoon

Notes:
Abbreviations: MMF - maximum monthly flow.

All of these nearby treatment facilities utilize activated sludge treatment processes and UV disinfection; however, the greatest variation in treatment can be seen in the processing of biosolids. Salmon Creek WWTF operates similarly to Camas through the land application of biosolids. Marine Park and Westside incinerate of solids produced at those City of Vancouver facilities.

4.5.1 City of Vancouver

The City of Vancouver currently uses 716 miles of sanitary sewer and forty-one pump stations to convey sewage to Vancouver's Marine Park and Westside WWTFs. Vancouver's collection system is divided into three basins currently: the Westside Basin, Eastside Basin, and Diversion Basin. Wastewater generated in the Eastside Basin is conveyed to and treated exclusively at the Marine Park facility. Diversion Basin wastewater is conveyed to and treated at either the Marine Park or Westside WWTF. Westside Basin sewage is conveyed to and treated exclusively at the Westside Treatment Facility.

The largest nearby treatment facility is Westside in Vancouver at 28.3 mgd average annual flow. Altogether, Marine Park and Westside WWTFs serve 195,000 residents per2022 census data. Currently, Marine Park does not treat its solids on-site and instead conveys them to Westside through a force main and gravity sewer. Once at Westside, a fluidized bed furnace incinerates scum and solids from the primary and secondary clarifiers at both plants.

4.5.2 City of Washougal

The City of Washougal currently operates fourteen LS throughout the City and conveys sewage through more than 1.5 miles of force mains to the Washougal Treatment Plant. The treatment plant consists of an oxidation ditch followed by a secondary clarifier and UV disinfection. Similar to other pants in the region, effluent is discharged to the Columbia River.

4.5.3 Clark County

Clark County formed the Discovery Clean Water Alliance (CWA) in January 2013 to provide framework for regional wastewater collection. The CWA serves unincorporated Clark County, the City of Battle Ground, the City of Ridgefield, and Clark Regional Wastewater District.

Nearby Salmon Creek WWTF is part of the CWA and serves approximately 100,000 residents. Although the average annual flow is typically between 8-10 mgd, the plant has the capacity to treat up to 15 mgd. Future expansion is underway to improve the Columbia River outfall as well as increase capacity to 17.5 mgd. Odor control will be built as well due to odorous air present particularly during the summer and early fall.

4.6 Natural Environment and Critical Areas

Topics considered to describe the existing system's natural environment include topography, soils and geology, and climate including rainfall. Critical areas within the natural environment highlight the connection between the sewer system and these characteristics. Critical areas include wetlands, critical aquifer recharge areas (CARA), geologically hazardous areas, frequently flooded areas, and fish and wildlife habitat conservation areas.

4.6.1 Natural Environment

Relatively steep topography with slow to moderate infiltration rates comprise a majority of the City's geography. The City enjoys moderate temperatures between the average high of 62 degrees Fahrenheit (°F) and average low of 37°F. Heavy rainfall, characteristic of the Pacific Northwest region, provides an average annual precipitation of 84 inches while snowfall is not typically heavy, annually averaging 9 inches.

4.6.1.1 Topographical Characteristics

As shown in Figure 4.3, elevation ranges from slightly above sea level (20 feet) to greater than 750 feet in the City. Steep slopes comprise a large portion of the landscape which range from 5 to 15 percent. A relatively flat plateau is present at the most central portion of the City near Prune Hill while the older, denser zones lie along the Columbia River. Similarly, the UGA was developed on a steep slope with the plateau at 470 feet elevation residing just outside of the City Limits.

4.6.1.2 Soils and Geology

According to the National Resources Conservation Service (NRCS), Clark County is approximately 5 percent cinebar stony silt loam with 30 to 70 percent slopes. However, the City is a much higher percentage of Lauren gravelly loam from 0 to 8 percent slopes and Hesson Clay loam from 0 to 8 percent slopes. These soil types are categorized as hydrological soil groups B and C, respectively, which indicate slow to moderate infiltration rates when wet with a slow to moderate rate of water transmission. This indicates moderate runoff coefficients for the region. Additional details on the soil groups are available in Figure 4.2.

4.6.1.3 Climate

The City's climate is characterized by a combination of rainfall, wind, and temperature patterns for the nearby region. The average high temperature is 62°F and the average low is 37°F. The temperature is known to vary from 36°F to 84°F throughout the year with a warm season from June to September. Altogether, summers last approximately three months with warm weather and winters are cold with the heaviest rainfall occurring late November or early December.

Historical precipitation data was gathered from Airport Way #2 Rain Gage (Station 111) of the City of Portland HYDRA Rainfall Network. The average five-year rainfall patterns indicate the November through February period averaging five inches per month or more with a peak in January at approximately 6.4 inches. The maximum annual rainfall occurred in 2017 at 53.24 inches total which is 32 percent greater than the average. The driest month of the year is typically July with no rainfall recorded for 2017 and 2018. The average annual rainfall patterns are detailed in Table 4.4. Average annual snowfall is nine inches and average annual precipitation is approximately 84 inches.

Table 4.8 City of Portland Station Precipitation 2017-2022

Year	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec	**Annual**
2017	4.25	11.63	9.02	5.33	2.64	1.49	0	0.12	2.54	5.33	7.06	3.83	**53.24**
2018	6.08	2.85	3.16	5.54	0.27	1.99	0	0.08	1.11	3.61	3.29	6.09	**34.07**
2019	3.31	5.2	1.7	4.46	1.77	2.13	0.28	1.25	3.85	1.8	1.73	4.73	**32.21**
2020	9.6	2.59	3.37	1.29	3.42	3.11	0.04	0.59	2.53	1.92	6.14	6.03	**40.63**
2021	7.64	4.36	2.41	0.5	1.6	0	0.02	0.09	4.09	4.87	7.8	8.89	**42.27**
2022	7.25	3.14	-	-	-	-	-	-	-	-	-	-	**-**
Average	**6.36**	**4.96**	**3.93**	**3.42**	**1.94**	**1.74**	**0.07**	**0.43**	**2.82**	**3.51**	**5.20**	**5.91**	**40.30**
Minimum	**3.31**	**2.59**	**1.70**	**0.50**	**0.27**	**0.00**	**0.00**	**0.08**	**1.11**	**1.80**	**1.73**	**3.83**	**16.92**
Maximum	**9.60**	**11.63**	**9.02**	**5.54**	**3.42**	**3.11**	**0.28**	**1.25**	**4.09**	**5.33**	**7.80**	**8.89**	**69.96**

4.6.2 Critical Areas

Critical areas define crucial components for planning in an area including protected lands, e.g., wetlands, CARAs, and conservation areas, as well as areas with greater risk to its inhabitants, e.g., frequently flooded areas and geologically hazardous areas. Identifying these areas allows for the mitigation of unnecessary risk or harm to protected lands; additionally, policies in the *Camas 2035 Comprehensive Plan* (Camas, 2016) outline goals to protect and restore these sites.

4.6.2.1 Wetlands

Ecology currently rates wetlands based upon several key factors including their 'ability to be replaced, sensitivity to disturbances, rarity, functional performance, and importance in biodiversity' (Ecology, 2006). These levels include categories I-IV with a Category I wetland requiring the greatest protection. As defined by the wetland rating system, Category I wetlands have valuable biodiversity and hydrogeomorphic functionality in pollutant removal, stormwater storage, and even buffering natural disasters.

Within the City, there are >1,200 acres of recognized wetland which are protected by several local, state, and federal ordinances and laws including the Growth Management Act, Critical Areas Ordinance, Clean Water Acts, and City municipal code (CMC) 18.31.050. These regulations entail the study of a wetland's functionality and that adverse impacts be avoided or reduced. Figure 4.6 illustrates the City's wetlands delineated using reports filed with the city and published data.

4.6.2.2 Critical Aquifer Recharge Areas

The majority of raw water supply for the City is provided by groundwater resources. This critical resource is protected by the CARA ordinance and the CMC. CMC 16.70.050 focuses on Aquifer Recharge Areas and required reports for proposed activities.

CARAs are located in multiple regions of the City and surrounding areas. Currently, two wellhead protected areas are within the City limits with the southernmost protected area extending beyond the UGA. Figure 4.4 shows these regions in relation to wells which serve more than 20 people.

4.6.2.3 Frequently Flooded Areas

Frequently flooded areas are defined as regions with >1 percent chance of flooding per year. These regions are near surface water bodies which include Lacamas Lake, Columbia River, Washougal River, Jones Creek, Boulder Creek, Round Leaf Lake, and Fallen Leaf Lake. Due to low elevations, portions of the southeastern region of the City are located within the 100-and 500-year Federal Emergency Management Agency (FEMA) floodplain. Construction regulations focus on decreasing flood hazards of the structure which area detailed in a critical area report.

4.6.2.4 Geologically Hazardous Areas

Geologically hazardous areas are typically defined by the possibility of natural disasters including earthquakes and volcanic activity. These hazard potentials are then increased by the presence of steep slopes prone to landslide, particular soil groups prone to liquefaction, and other circumstances which have the potential to compound emergency scenarios. The United State currently operates on a Category 1-4 system to determine building code stringency as it pertains to natural disasters where category 4 is the most stringent. The City is rated as a Category 4 which indicates a high potential for landslides and other events.

In Chapter 40.430, Clark County defines three types of geologic hazard areas which include seismic, landslide, and steep slope. The county's Geologic Hazard regulation requires developers to have a Geologic Hazard Area Study completed on any property which is identified in a hazard area.

4.6.2.5 Fish and Wildlife Habitat Conservation Areas

As defined in the City's 2035 Comprehensive Plan, one of the primary plans for the City is to protect "habitat and safe passage for wildlife from Green Mountain to the Columbia River" (Camas, 2035). Multiple threatened species have been found to inhabit or pass through the region, and regulations are currently in place to prevent harm to any habitat including Washington Administrative Code (WAC) 365-190-130. These regions are defined as Fish and Wildlife Habitat Conservation Areas which are protected.

Regulations include completing a habitat assessment before construction. These regulations impact any proposed sanitary sewer pipelines or pump stations in order to protect the fish and wildlife habitat.

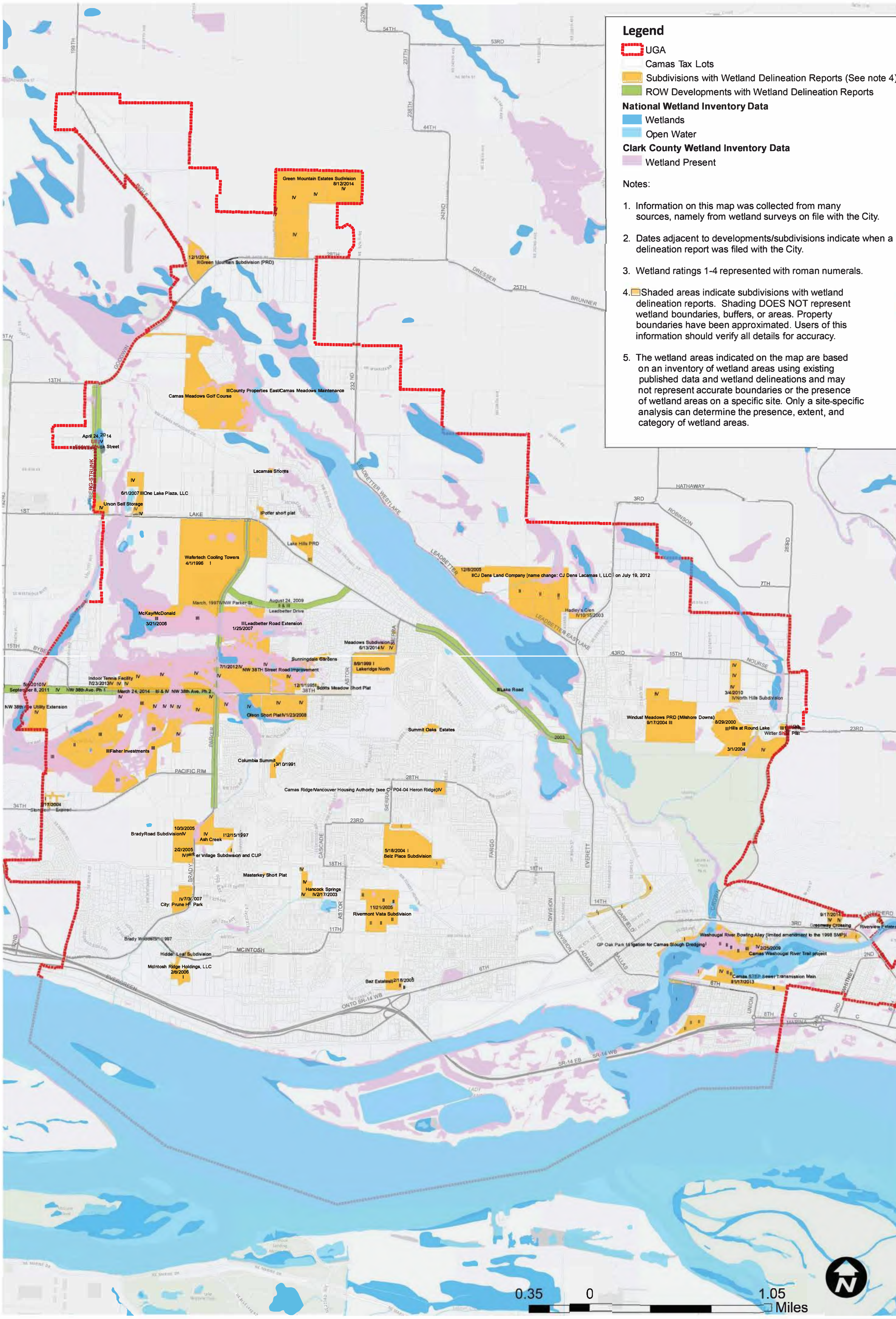


Figure 4-6 Camas Wetlands Map

Item 3.

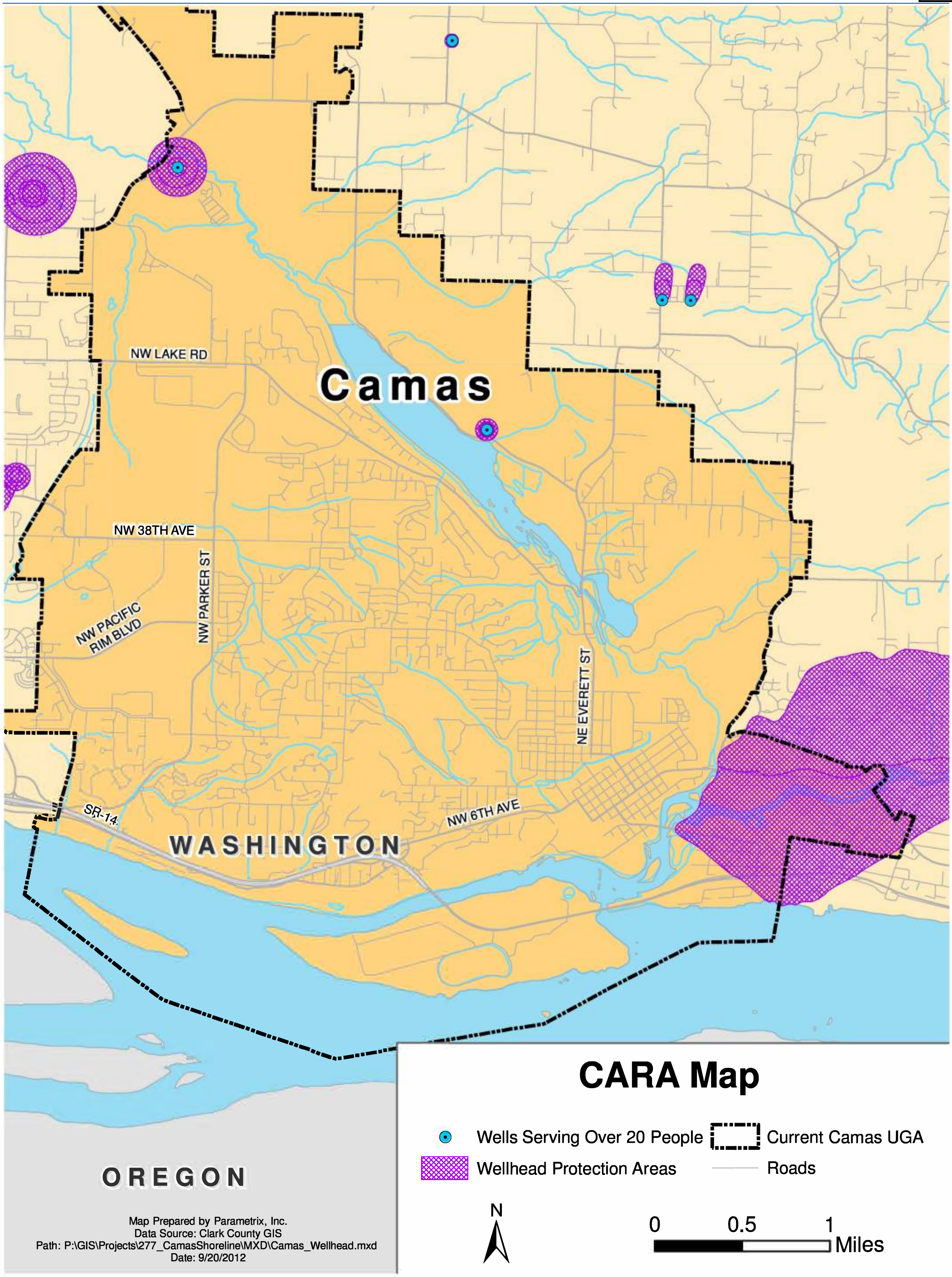


Figure 4.7 CARA Map

4.7 Water System

The City owns and operates a multi-source municipal water system, shown in Figure 4.8, which uses ground water and surface water to supply, treat, store, and distribute potable water to residential and commercial customers. The City currently obtains its water from ten groundwater wells and two surface water resources. The wellhead protection areas are regulated to prevent leakage from the sanitary sewer system from infiltrating a well; these areas are shown in Figure 4.9. The surface water resources include the Jones Creek Intake constructed in 1913 and the Boulder Creek Intake constructed in 1931. These intakes are permitted to flow at 1,570 gpm and have lower operating expense than groundwater sources. The ten groundwater wells are located in the 343 Zone excluding Well 9 which is located in the 544 Zone.

The City currently maintains the capacity to store 8.45 million gallons (MG) at multiple facilities including Butler Reservoir (1.2 MG), Gregg Reservoir (0.1 MG), Lacamas Reservoir (2.0 MG), Lower Prune Hill Reservoirs (2.0 MG), and the Upper Prune Hill Reservoirs (3.15 MG). This capacity is available for normal and emergency conditions, such as fire suppression. Service is provided to customers across five major pressure zones and 18 subzones. Eight booster pump stations are used to move water between pressure zones. Table 4.9 below lists the booster pump stations and their capacities.

Table 4.9 Camas Booster Pump Stations

Booster Pump Station	Capacity (gpm)
Butler	1,400
New Gregg	1,000
Forest Home	3,500
Lower Prune Hill	2,500
Lacamas	2,500
Angelo	4,000
Upper Prune Hill	2,900
Crown Road	1,600

The City owns over 143 miles of pipelines in its water transmission and distribution system compared to only 87.5 miles of collection system. Approximately 47 percent of the pipeline is Ductile Iron followed by Cast Iron at 15 percent. Additionally, the distribution system includes numerous meters, isolation valves, and hydrants. An emergency intertie is available with the City of Washougal as well while an agreement with the City of Vancouver includes the use of two fire hydrants located at SE 1st and Friberg.

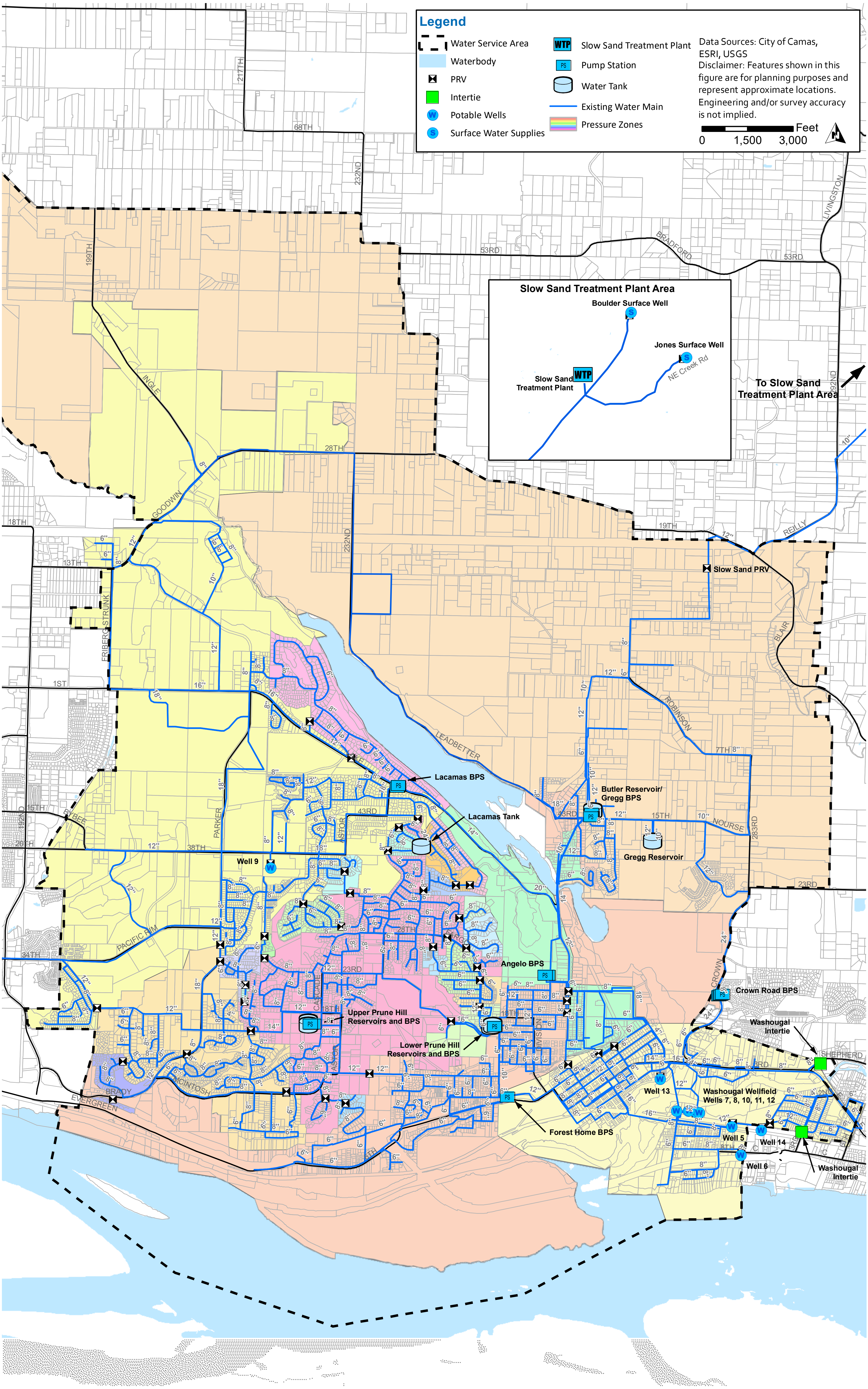


Figure 4.8 Water System Map

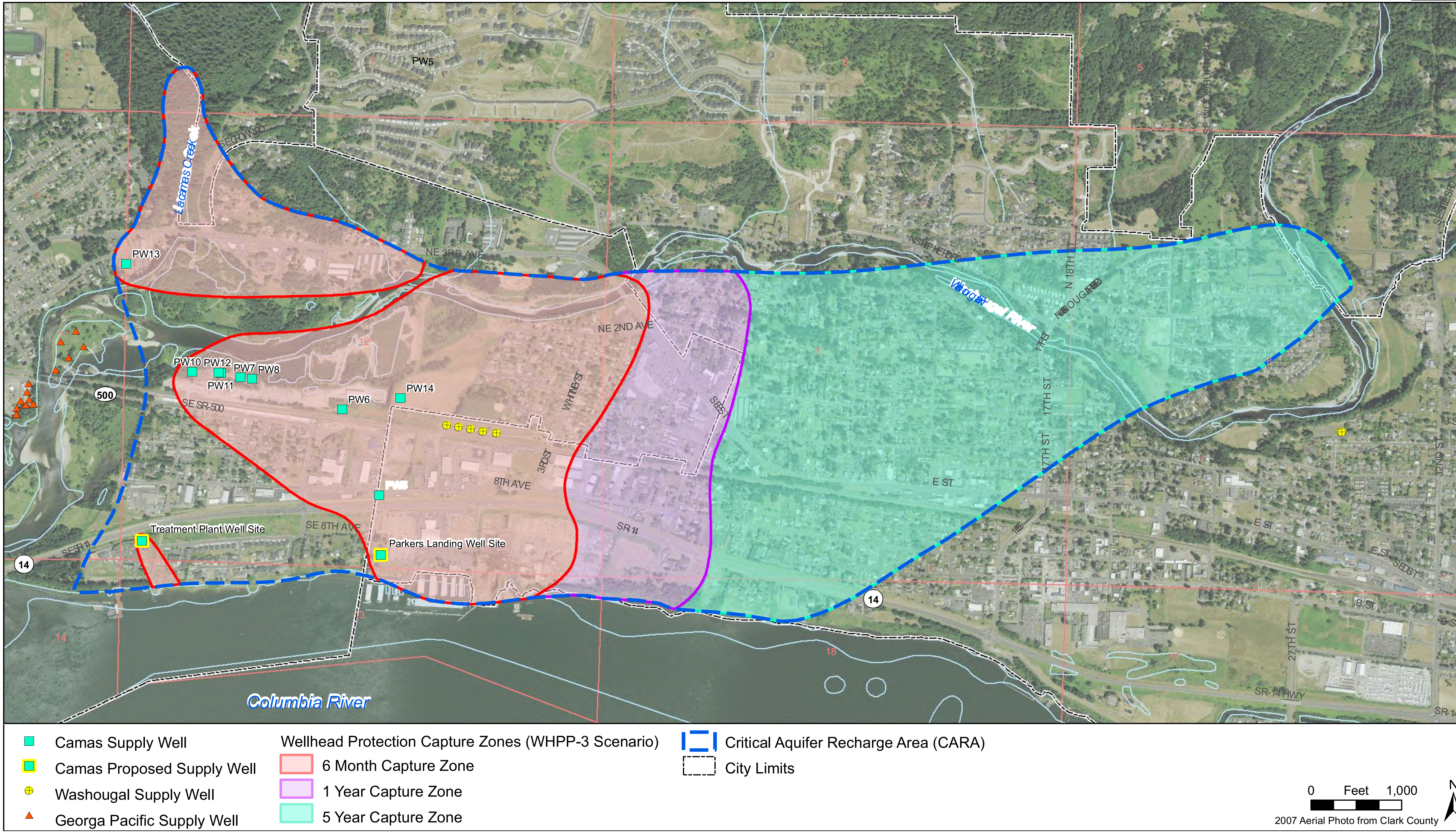


Figure 4.9 Wellhead Protection Capture Zones

Chapter 5

INFLOW / INFILTRATION PROGRAM

5.1 Introduction

Special condition S.4.E of the City's 2015 National Pollutant Discharge Elimination System (NPDES) Permit required the City to submit an annual Inflow and Infiltration (I/I) Analysis Report. The City received lower than typical treatment plant process removal efficiencies in their 2015 NPDES permit to account for the dilute Septic Tank Effluent Pump (STEP); Septic Tank Effluent Filter (STEF); and Septic Tank Effluent Gravity (STEG), which contribute approximately half of the plant influent, as well as low strength industrial wastewater. This accounts for the lower biological solids loading expected from septic tank effluent, which makes removal efficiency more difficult to achieve at the WWTF. This lower treatment standard could also potentially mask excessive I/I. Therefore, the City was required to conduct an Annual I/I Analysis report to prove the City is controlling I/I. The City completed the following reports: Infiltration and Inflow Study (Gray & Osborne, 2016); the May 2016-April 2017 Annual Inflow and Infiltration Report; the May 2017-April 2018 Annual Inflow and Infiltration Report; and the May 2018- April 2019 Annual Inflow and Infiltration Report. In 2020 an Infiltration and Inflow Follow-Up Study (Gray & Osborne, 2020) was completed to document improvements within the City's collection system. This section references findings from these reports as well as generally describing the City's I/I program.

Infiltration and inflow consist of two components which may combine or act independently to increase flow volume and peak flows in the sewer system. If too much I/I enters the sewer system such that the sewer system is operating at or above its capacity, sanitary sewer overflows (SSO) could occur. More dilute waste can also be difficult to treat if using percent removal criteria as the basis, as noted above. Proper attention to the lower than typical biological solids loading under these conditions is warranted in design and operation of the WWTF. The definitions of infiltration and inflows are described below:

- **Infiltration:** Infiltration is defined as stormwater or groundwater flows that enter the sewer system by percolating through the soil and then through defects in pipelines, manholes (MH), and joints. Examples of infiltration entry points are cracks in pipelines, misaligned joints, and root penetration. Due to this process, infiltration may be seen hours after a storm has occurred.
- **Inflow:** Inflow may be seen immediately after or during the storm. Inflow occurs when stormwater enters the sewer system via storm drain cross connections, leaky MH covers, or cleanouts. Examples of inflow entry points are roof drains and downspout connections, leaky MH covers, and illegal storm drain connections. Gross pipeline or system structural defects can be severe enough to allow storm or groundwater to enter the system rapidly and exhibit response time characteristics that could be categorized as inflow.

Key adverse effects of I/I on wastewater collection and treatment facilities include:

- Surcharging of sewer MHs.
- Sewage backups in facilities.
- Hydraulic overloading of unit processes at the wastewater treatment facility (WWTF).
- Reduced treatment efficiency at the WWTF due to dilute concentrations.
- Prematurely reaching capacity for collection systems and/or WWTF components.

This Chapter focuses on summarizing the City's efforts on I/I reduction from 2016 through 2020 and the quantifiable, positive improvement that has been accomplished in reducing I/I. It summarizes the amount of I/I for these years and specific projects completed to address I/I.

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5.2 Historical I/I Control Efforts

The City has conducted I/I studies since 1977. The City has spent more than $4.55 million in collection system I/I work and $750,000 in wastewater treatment facility improvements to address I/I flows.

The 1977 I/I Report attributed approximately 2.6 million gallons per day (mgd) to infiltration and 2.1 mgd to inflow. Major infiltration sources identified included roof and foundation drains, catch basins and multi-hole MH covers. By 1987, a sealing project was underway for individual sewer services.

In 1994, CH2M Hill wrote a memorandum stating that estimated I/I entering the system was 3.54 mgd and the major source was likely faulty service connections. It was concluded that a more cost-effective alternative to reducing I/I would be to increase treatment capacity.

In 1997, a Facility Plan determined the City had excessive I/I based on U.S. Environmental Protection Agency (EPA) criteria, and an 8-year sewer system rehabilitation program began based upon basins with the highest risk. During this study, a peak I/I flow of 3.4 mgd was determined.

In 2007, excessive inflow was determined at 62 gpcd for infiltration and 383 gpcd for inflow. This is based on the EPA criteria for excessive I/I to be 120 gallons per capita day (gpcd) for infiltration and 275 gpcd for inflow. At total of 26 collection system projects were identified to address capacity and condition issues, 18 of which would reduce I/I.

In 2016, the City commissioned an evaluation of the collection system to document existing infiltration and inflow as a condition of their new stormwater permit. This evaluation utilized pump station run time, WWTF flow, and precipitation records to identify basins that were yielding high I/I values. This provided data to confirm the basins with high I/I, which were 3s, 3n, 4, and 10. Then smoke testing, manhole inspection, and CCTV inspection were used to identify specific locations within basins where improvements could be made to lower I/I. The results of 2016 I/I Study were used to plan and prioritize projects in order to reduce I/I:

1. In 2020, the City commissioned a follow-up study to document the reduction in I/I achieved by implementing the recommendations of the 2016 evaluation. The specific objectives of the 2020 study included: Comparing the I/I with that measured in previous

flow monitoring efforts completed for the 2016 I/I Study to assess the efficacy of rehabilitation efforts
2. Identifying areas of the City where the I/I related peaking factor exceeds 3.4:1
3. Identifying additional areas of high I/I in order to new areas for rehabilitation

The 2020 Study demonstrated that since 2016, the City has observed a reduction in peak WWTF flows and high flow events, even though the population of the City and the extent of the sewer system have both increased over this time. Additionally, the City's WWTF no longer experiences excessive infiltration or inflow as defined by the EPA, which is examined below in Section 5.7.3.

The most recent I/I projects completed are summarized in this report. Future planned projects can be viewed in Appendix F.

5.3 Required I/I Reporting

Special condition S.4.E of the 2015 Camas WWTP NPDES permit required the City to conduct a study of inflow sources and annual analysis of I/I using the Washington State Department of Ecology's (Ecology) Information Manual for Treatment Plant Operators. Special condition S.4.E indicates the Annual I/I Report should include:

1. Average monthly flow and total precipitation for each month for the past year.
2. Maximum monthly and peak hourly hydraulic design capacity for the plant.
3. Design population equivalent for the treatment plant and population served by the facility for the past year.
4. The amount of I/I for each year since the base year and the percent of maximum monthly design capacity each year's I/I represents.
5. Percent increase or reduction in I/I for each year after the base year I/I.
6. Additional lengths of sewer lines added to collection system for the past year.

The Annual I/I reports for 2016, 2017, and 2018 and the City's I/I Program are provided in Appendix F and summarized throughout this chapter. Values in this Chapter are based on numbers that were reported in the Annual Reports. Please note that the City is updating their treatment plant capacity and values may change after completion.

5.4 Calculated I/I

Special condition S4.E.3 of the 2015 NPDES permit states that the annual period for the required I/I reporting is May 1st through April 30th. The 2016 Annual Report selected May 2011-April 2012 to be the base year to compare future I/I against, which is highlighted in Table 5.1. This base year was selected because it represents the 20-year median rainfall very closely. The average 12-month rainfall in Camas from the twenty-year period of 1997 to 2017 was 46.43 in, and from May 2011-April 2012 the rainfall was 47.60 in, which was the 50th percentile of all twenty 12-month totals and only 1.17 inches more than the twenty-year average. Additionally, using 2011-2012 as the selected base year incorporates the City's recent growth. Per permit requirements, the I/I was compared with maximum monthly hydraulic design capacity for the Camas Wastewater Treatment Plant. Additionally, I/I was compared with the previous year. The fluctuations seen in I/I in Table 5.1 are largely due to variations in rainfall. Reductions in I/I from specific projects are presented in further sections.

Table 5.1 Annual Report Calculated I/I

Year	Calculated I/I (mgd)	I/I as Percent of Design Capacity	I/I Percent Increase/Decrease
2011	1.511	25%	N/A
2012	2.340	38%	+55%
2013	0.591	10%	-75%
2014	0.985	16%	+67%
2015	2.277	37%	+131%
2016	1.920	31%	-16%
2017	1.021	17%	-47%
2018	1.052	17%	+3%

5.5 Field Investigation

Several evaluations were conducted to determine areas of excessive I/I. Field investigation methods include flow monitoring and analysis, smoke testing, MH inspection, and video inspection.

5.5.1 Flow Monitoring and Analysis

According to the NPDES permit, the City is required to:

- Quantify the level of inflow from each collection system basin or sub-basin in order to identify areas exceeding a peak day to monthly average peaking factor of 3.4:1 during the design rainfall event.
- Prioritize the list of projects to most cost effectively reduce the level of inflow to a peaking factor of 3.4:1 or less.

The analysis for flow monitoring includes evaluation of WWTF flow data, pump station run-time data, and collection system flow monitoring data. The highest-ranking storm event identified occurred on January 1, 2009 with 3.1 inches rainfall and 7.711 mgd WWTF influent followed by January 19, 2012 at 2.0 inches rainfall and 7.534 mgd WWTF influent. The design storm was estimated with the January 1, 2009, rainfall event. For pump station run-time, Crown View, Lacamas Creek, South Prune Hill, and West Camas were identified to exceed the peaking factor criterion of 3.4:1. Thus, the basins these pump stations are located in were targeted for further flow assessment.

Major storm events and corresponding WWTF influent flow are typically indicative of I/I activity in a collection system. During the 2016 I/I Study, basins of concern were Crown View (Basin 3N), Lacamas Creek (Basin 7), South Prune Hill (Basin 10), and West Camas (Basin 10) with ratio normalized to peak day of 5.904, 5.433, 3.554, and 3.299, respectively.

The highest priority flow monitoring locations are Basins 3 and 4 with the greatest I/I which exceeds the NPDES Peaking Factor criterion. Basins 3 and 4 are shown in Figure 4.2 in Chapter 4.

For the 2020 I/I Follow-up Study, temporary flow meters were installed in October 2019 in the collection system to determine the state of I/I in the City and assess the impact of previous I/I reduction projects. From this evaluation, the City was able to see areas still with peaking factors exceeding the NPDES Peaking Factor Criterion for peak day to average flow of 3.4:1.

5.5.2 Smoke Testing

Smoke testing is a typical means of conducting a physical assessment of a wastewater collection system. Smoke testing locates potential sources of I/I by blowing artificial smoke into a collection system, typically at a MH, and visually observing where the smoke escapes, indicating breaks in the collection system as well as cross connections between the sewer system and storm drain systems and roof drains.

Smoke testing was conducted from August 14 to August 26, 2015 as a part of the 2016 I/I Study. The test identified 92 locations where inflow could potentially occur where a majority was cleanouts that were either broken or without covers or where smoke was observed coming out of the ground. The highest observed sources of smoke occurred in Basin 3N, 3S, 4, and 5, as summarized in Table 5.2. A small number of roof drains and catch basins connected to the sewer system were identified. Defects were also identified near two MHs in Basin 3N through smoke testing.

Table 5.2 2015 Smoke Test Results

Basin	Cleanouts	Catch Basins	MHs	Roof Drains	"Ground Smoke" (Likely Side Sewers)	Total
1	1	0	0	0	1	2
2	3	0	0	0	1	4
3N	12	0	2	1	3	18
3S	2	0	0	1	13	16
4	4	1	0	1	6	12
5	2	1	0	1	10	14
6	0	2	0	2	3	7
7	1	0	0	0	0	1
8	4	0	0	0	1	5
9	3	0	0	0	0	3
10	6	1	0	0	3	10
Total	**38**	**5**	**2**	**6**	**41**	**92**

5.5.3 Manhole Inspection

Wastewater collection system MHs represent a relatively easy means of viewing what is occurring in a collection system because they:

- Allow for a visual inspection of flow.
- Are potential sources of I/I themselves due to deterioration or how they were constructed.
- Are insertion points for flow meters to measure flows within a collection system.

During the investigations in 1997 and 2015, all basins were tested. In the 1997 study, leaking MHs were found in Basins 1, 2, 3N, 4, 5, 6, 7, and 10. In the 2016 study, of the 95 MHs inspected in Basin 3S, 3N, 4, 5, and 7, only 14 were found to have reportable issues. Defects identified in these MHs are summarized in Table 5.3.

Table 5.3 2015 Manhole Inspection Results

Basin	Number of MHs leaking (2015)
3S	3
3N	4
4	2
5	4
7	1
Total	**14**

5.5.4 Video Inspection

The City contracts with specialist firms to perform regular closed-circuit television (CCTV) inspections of its gravity sewer system. The inspections identify structural and operational defects, such as broken pipes, cracks, grease, roots, sag, separated and offset joints, and other problems. Several structural defects identified in CCTV inspections were repaired when identified. Other defects may be addressed through increased preventative maintenance, repair, or monitoring. In 2016 as a result of the flow monitoring work completed for the 2016 I/I Study, the City selected an area of the sewer system that frequently exceeded the 3.4:1 peak to average flow ratio. This area was the section of sewer system that drains to the Crown View Lift Station, and CCTV inspections were evaluated to identify potential I/I sources. The results were used to develop a list of projects which the City incorporated into their ongoing repair and replacement program.

5.6 Identified I/I Projects

From the field investigation, projects were developed and given a level of priority based on their potential to remove I/I. Priority basins for I/I reduction were 3N, 3S, and 4. Future I/I projects are slated for the City's other basins.

High priority projects developed to guide the likely schedule of I/I mitigation projects were described as follows:

- Action explicitly required by NPDES permit.
- Disconnect catch basins from sanitary sewer and connect to storm sewer.
- Repair cleanouts with > 500 gallons per day (gpd) estimated inflow.
- Disconnect downspouts.
- Replace significantly deteriorated MHs.
- Raise MH lids to minimize inflow.
- Repair significantly deteriorated or sagging pipe, with highest priority on problems observed in Basins 3N, 3S and 4, followed by Basins 5 and 6.

With the completion of high priority work only, the sewer system is anticipated to achieve the NPDES permits required ratio of peak day to monthly average flows in all basins. If it is not reduced, then the medium high priority projects will be completed, then the medium and lastly the low. Table 5.4 includes basins targeted and total capital required to complete the projects. The suggested timeline was for high priority projects to be completed in 2016-18, medium high priority in 2019, medium priority in 2020-2025, and low priority from 2026-2029.

Table 5.4 Summary of I/I Projects and Costs Listed in 2016 I/I Study

Year	Basins	Targeted Cost[1]
2016	3N, 3S, 4	$328,000
2017	1, 2, 3N, 3S, 4, 5, 6, 10	$380,000
2018	2, 3N, 3S, 4, 5, 6, 7	$500,000
2019	5, 7, 8, 9, 10	$130,000
2020	3N	$150,000
2021	3N, 3S	$135,000
2022	3S,	$150,000
2023	3S, 4	$150,000
2024	4, 5, 8, 9	$150,000
2025	9, 10	$50,000
2026-2028	1, 2, 5, 6, 7, 8, 9	$325,000

Notes:
(1) All cost values were determined by Gray & Osborne. All values are believed to be in 2016 dollars.

The 2015 I/I report included a project schedule with all planned projects for the next 10 years. The 2016, 2017, and 2018 Annual Reports denote on the project schedule which projects have been completed.

5.7 Completed I/I Projects

As mentioned previously, five high priority projects have been completed, as shown in Table 5.5. These projects have cost the City in excess of $1.5 million dollars. The City conducted pre- and post- construction monitoring for the two largest projects, which are summarized in Section 5.7.1 and 5.7.2.

Table 5.5 Completed I/I Projects

Year	Basin	Project Title	Description	Project Cost[1]
2019	10	View Ridge Court Sewer Replacement	Replacement of sewers	$370,000[3]
2017	4	NE Dallas Street Sewer Replacements	Replacement of several sewer pipes	$129,000[3]
2017	4	NE Adams Street Sewer Replacements	Replacement of several sewer pipes	$100,000[3]
2017	4	Everett and Franklin Sewer Replacement	Replacement of sewer line from 19th and Franklin to Everett and Everett to 21st	$352,000[3]
2016	4	Franklin Street Sewer Improvement	Replace sewer line between MH 4-1-1 and MH 4-1-4	$952,883[2]
2018	3S	Mill Ditch Repair	Replaced section of sewer line between Dallas Street and Birch Street	$417,105[2]
2018	3S	Mill Ditch Repair	Rehabilitate or replace 15-inch CONC from MH 3-2-6 to 3-1-1 (1,370 feet)	

Notes:
(1) Cost values reflect actual construction costs at the time of completion.
(2) Value from the 2017 Annual Report.
(3) Value from the I/I Follow-Up Study.

5.7.1 Franklin Street Sewer Improvement Project

The Franklin Street Sewer Replacement Project was completed in October 2016. The project involved replacing and upsizing approximately 1,600 feet of sewer line that had been video inspected along Franklin Street between NE 19th Avenue and NE 14th Avenue and were found to contain cracks and sag. Table 5.6 summarizes the inflow before the project and changes in flow observed after project completion. The project effectively reduced inflow by approximately half during typical flow conditions. No reduction was seen during the largest storm monitored, which is likely due to upstream inflow sources outside of the scope of the project.

Table 5.6 Franklin Street Sewer Project I/I and Flow

Manhole	Basin Measured	Flow Meter Installed	Flow Meter Removed	Parameter (mgd)	Daily Flows (mgd)			Rainfall/ days(1)
					Min	Ave	Max	(in/day)
MH 3-2-6 Pre-Construction	4	1/5/2016	1/20/2016	Flow Inflow	0.411 0.303	0.749 0.641	1.019 0.911	0.3593
MH 3-2-6 Post-Construction	4	3/4/2017	3/30/2017	Flow Inflow	0.127 0.017	0.447 0.337	1.054 0.944	0.3362

Notes:
(1) This is the total cumulative rainfall over the duration the flow metered.

5.7.2 Mill Ditch Repair Project

The Mill Ditch Sewer Line Replacement was completed in April 2018. The project included replacing approximately 900 feet of deteriorated 15-inch concrete main with 21-inch high-density polyethylene (HDPE) pipe and manholes. Table 5.7 summarizes the inflow before the project and changes in flow observed after project completion. The project effectively reduced inflow by approximately half during typical flow conditions. Due to the timing of the project and dry spring weather, post construction flow monitoring was not completed until 2019. The increase in inflow during the largest storm monitored is likely due to differences in rainfall intensity between the pre- and post-construction periods and upstream inflow sources outside of the scope of the project.

Table 5.7 Mill Ditch Project I/I and Flow

Manhole	Basin Measured	Flow Meter Installed	Flow Meter Removed	Parameter (mgd)	Daily Flows (mgd)			Rainfall(1)
					Min	Ave	Max	(in/day)
MH 5-8-1 Pre-Construction	3N, 3S, 4	2/5/2016	2/23/2016	Flow Inflow	0.352 0.68	0.909 1.114	1.969 1.617	0.1756
MH 5-8-1 Post-Construction	3N, 3S, 4	3/19/2019	6/4/2019	Flow Inflow	0.46 0.245	0.795 0.58	2.496 2.28	0.0906

Notes:
(1) This is the total cumulative rainfall over the duration the flow metered.

5.7.3 I/I Reduction Summary

In 2020, the City commissioned a follow-up study to document the reduction in I/I achieved by implementing the recommendations of the 2016 evaluation. The purpose of this work was to compare estimated per capita I/I from the 2016 study and 2020 against EPA criteria. The EPA's threshold for excessive infiltration is 120 gallons per capita per day (gpcd) is and the threshold for excessive inflow is 275 gpcd. The per capita infiltration flow accounts for domestic wastewater flow, infiltration, and nominal industrial and commercial flows. Inflow values are based on the maximum daily influent flow at the WWTF between 2019 and 2020.

The initial Infiltration and Inflow Study (Gray & Osborne, 2016) determined that per capita infiltration in the collection system was 80 gpcd, which was below the EPA threshold for excessive infiltration. This study determined that inflow was a much more significant source of I/I in the collection system with an estimated flow 348 gpcd, which is excessive per EPA criteria. As a result of I/I projects completed between 2016 and 2020 the City's per capita infiltration was reduced to 46 gpcd. During this same period the City's per capita inflow was reduced to 176 gpcd and is no longer considered excessive.

Table 5.8 summarizes the improvements in per capita I/I for the City's collection system.

Since 2016, the City has completed I/I reduction projects each year, totaling well over $1 million. According to the 2020 Follow-up I/I Study, along with the reduction of I/I since 2016, the performance of the WWTF has improved as well. The WWTF has not experienced an I/I related effluent violation for over three years (since February 2017). While the I/I reduction is presumably not the only reason the WWTF's efficacy has improved, reductions in I/I due to the City's reduction efforts has certainly played a crucial role.

Table 5.8 Per Capita I/I Compared to EPA Criteria

Parameter	EPA Criteria for Excessive I/I (gpcd)	I/I Value for Camas in 2014 (gpcd)	Current I/I Value for Camas (gpcd)
EPA Excessive Infiltration Criteria	120	80	46
EPA Excessive Inflow Criteria	275	348	176

5.8 Planned I/I Projects

The City has two major pump station improvements projects planned to be constructed within the next five years. These are the Crown View Pump Station Improvements project and the Lacamas Creek Pump Station Replacement project. The design for each of these projects was completed in 2020 but bidding documents have not been issued for construction. In addition, the City will continue to address I/I throughout the collection system through their ongoing repair and replacement program. The 2020 Follow-up I/I Study expects that the Crown View Pump Station Improvement will significantly reduce I/I in Basin 3n, and the Lacamas Creek project will significantly reduce I/I in Basin 7.

Table 5.9 Planned I/I Projects

Year	Basin	Project Title	Description	Project Cost
Ongoing	N/A	Gravity Main Repair and Replacement	Ongoing repair and replacement of gravity mains at end of useful life.	$150,000/year
2020	3N	Crown View Pump Station Improvements	Includes stormwater improvements to reduce I/I entering the pump station	-
2020	7	Lacamas Creek Pump Station	Includes replacing the pump station and sewer pipe	$4.03M

Chapter 6

COLLECTION SYSTEM

6.1 Introduction

The City of Camas's (City) customer base continues to increase through system expansion. With this growth, some of the City's sewer infrastructure may reach conveyance capacity. This chapter presents an evaluation of the available capacity of the existing system to convey current and future sewer flows. The City's collection system is broken up between gravity mains and septic tank effluent pumping (STEP) systems that flow to the Treatment Plant separately.

Using the City's updated sewer model, major pipes and pump stations in the modeled collection system were evaluated for meeting established capacity criteria. The modeled collection system is primarily large gravity sewers which represent a skeletonized version of the system. The City has a limited GIS inventory of the collection system so no updates to the extent of the system that is modeled could be made. The STEP system was not included in the hydraulic model. Thus, capacity evaluation was only performed for the modeled gravity portion of the collection system. An overview of the modeled collection system is shown in Figure 6.1. The current modeled service area, in pink, represents the portion of the model evaluated in the existing scenario based on flow monitoring. The system was calibrated with four flow meters, which delineated the model system into four flow monitoring basins with similar diurnal patterns and wet weather flow parameters, also shown in Figure 6.1. The 2035 year and build-out scenarios expanded the modeled service area to the NUGA in the North of the system, shown in green. Additional details on the model used to evaluate the collection system can be found in Appendix E - TM Hydraulic Model Development. This chapter identifies recommended projects that correct capacity deficiencies and will be required to serve future users.

6.2 Evaluation Criteria

Defining performance criteria is a critical step in the master planning process because it sets metrics by which the collection system infrastructure will be evaluated to meet service goals set by the City. Sewer pipe capacities are dependent on many factors, including roughness of the pipe, the maximum allowable depth of flow, or slope of pipe. The City's application of these factors and established requirements are discussed below.

It is important to differentiate performance and design criteria when judging the performance of collection system infrastructure. Design criteria establish the standards for designing and constructing new sewers. Performance criteria establish the standards that are used to analyze adequacy of existing facilities and to trigger future infrastructure needs. Performance criteria are commonly less stringent than design criteria because existing sewer systems typically have aged significantly and would require extensive reconstruction to meet standards for new design. It is generally inappropriate to use standard design criteria as performance criteria, especially when significant wet weather flows impact an existing collection system (as is the case with an aged sewer system). For instance, new sewers are designed to convey flow under non-surcharged conditions (assuming limited inflow and infiltration [I/I]), while surcharging may be permissible during the analysis of existing sewers, especially during peak wet weather flows (PWWFs). The following sections describe the City's established design criteria and performance criteria used herein.

6.2.1 Design Criteria

The design criteria are used to size new infrastructure recommended to alleviate system deficiencies for this system evaluation.

6.2.1.1 Conveyance System

It is common practice to use diameter-based flow depth criteria for pipes when designing new gravity sewers. The depth/diameter (d/D) ratio is defined as the depth of flow in a pipe during peak flow conditions divided by the pipe's diameter. The City's Sewer Standards define the acceptable d/D values for design of new sewers under design storm conditions:

- All sewers shall be designed to flow at a d/D no greater than 1.2 at peak flow rates under build-out conditions, and d/D of 1.0 for existing condition.
- No surcharging (d/D>1) is allowed at shallow manholes. Shallow manhole are defined as manholes where the distance between crown of pipe and manhole rim is less than three feet.
- During the PWWF for design storm, water levels were not allowed to rise up to three feet below manhole rim.

6.2.1.2 Pump Stations and Force Mains

Any new pump stations recommended will need to follow the City's Sewer Standards for pump stations and force main construction to meet Department of Ecology (DOE) requirements. These are detailed in Section 2.2.2 of Chapter 2 - Policies.

6.2.2 Performance Criteria

6.2.2.1 Design Storm

The sewer system hydraulic capacity analysis was performed using a historical 10-year, 24-hour rainfall event (Station Portland Airport (PDX), HYDRA Rain Gauge Network) on December 6, 2015. This design storm is discussed in Section 3.4.6 of Chapter 3 - Basis of Planning.

For this general sewer plan (Plan), the HYDRA historical event referenced above was selected as the design storm for modeling system response and system performance evaluation to realistically represent peak wet weather conditions. The historical HYDRA event was chosen for three reasons:

- The National Oceanic and Atmospheric Administration (NOAA) Precipitation Atlas defines a 10 year, 24-hour event as 3.5 inches per 24 hours based on isopluvial lines through Camas.
- The rain gauge measured 3.37 inches per 24 hours and includes storm hydrograph data. This event had a 20-year recurrence interval based on evaluation of the historical dataset.
- The City 's historical 20-year, 24-hour volume is approximately the same as the NOAA, 10-year.

6.2.2.2 Conveyance System

When evaluating existing sewers, using a conservative d/D ratio may lead to unnecessary replacement of existing pipelines. The PWWF was defined using the standards summarized in Section 6.2.1.1.

Sewer pipes were allowed to surcharge under these PWWF conditions. If the flow depth was greater than the maximum allowable Hydraulic Grade Line (HGL), then the sewer was deemed deficient and mitigation might be proposed to provide greater flow capacity. Shallow manholes locations are shown on Figure 6.1.

6.2.2.3 Pump Stations and Force Mains

The City's performance criteria for existing pump stations include firm capacity, which is capacity with largest pump out of service and force main velocities. According to City Sewer Standards:

- Firm pump capacity shall be provided to handle the PWWF from the pump station's tributary area.
- Firm pump capacity is defined as the largest pump out of service.

The evaluation of existing force mains is based on a maximum pipe velocity of eight feet per second (ft/sec) for the design storm. No such evaluation was performed in this Plan as the hydraulic model was set up with simplified pump station assumptions and did not model force mains directly.

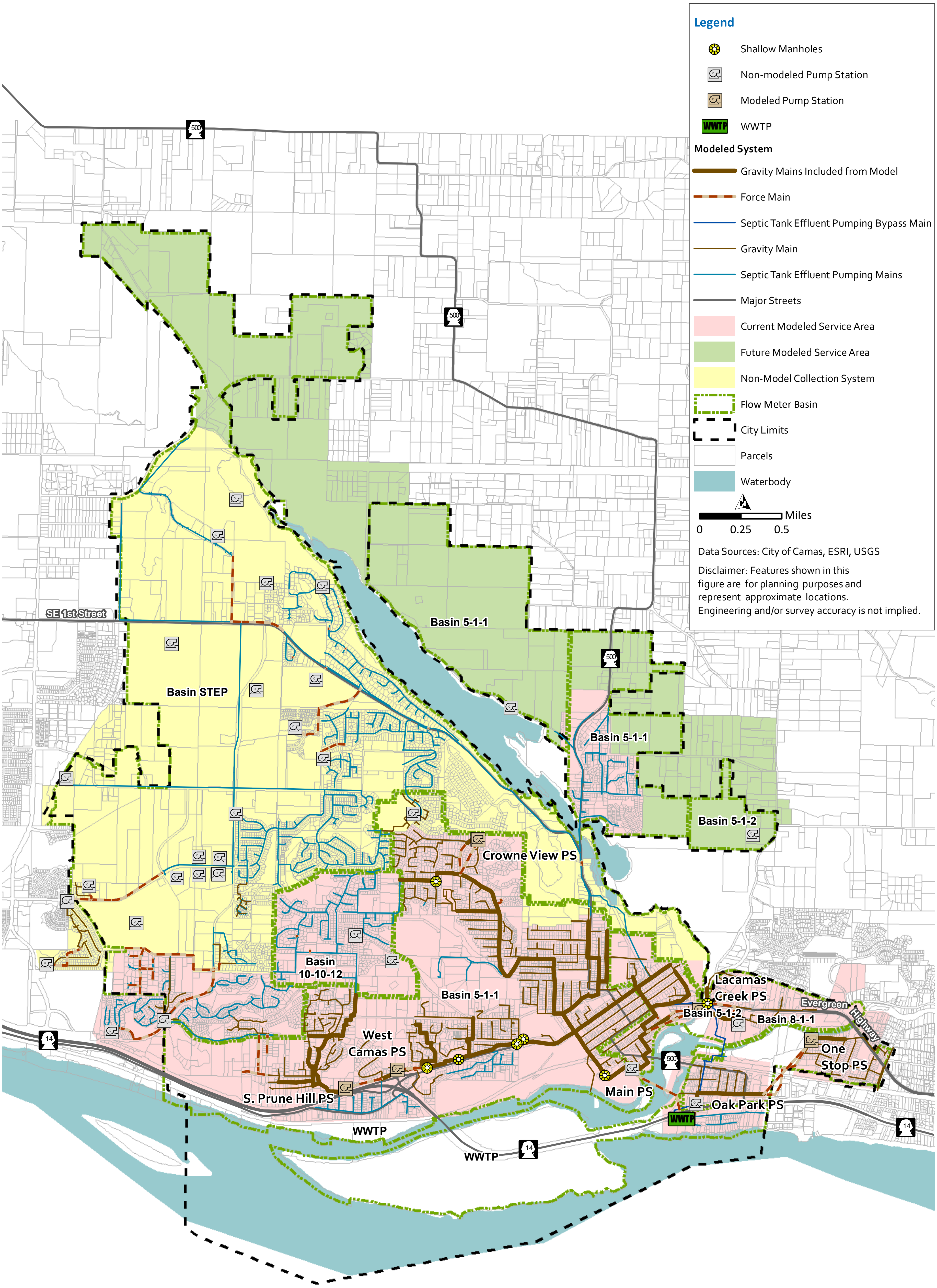


Figure 6.1 Shallow Manholes

6.3 Gravity Collection System Evaluation

A capacity analysis of the modeled collection system was performed using the City's calibrated hydraulic model and using the evaluation criteria identified above in Section 6.2. The capacity analysis entailed identifying areas in the sewer system where the performance criteria for surcharging was exceeded, or where the capacity of pump stations was exceeded. The collection system was evaluated for three development scenarios:

- Existing: Matching existing conditions.
- 2035: Incorporating growth through 2035 as identified in the previous comprehensive plan.
- Build-Out: Development of the full-service area including urban growth boundary (UGB).

For the remainder of the chapter, the system evaluation will focus on the existing and build-out system. The difference between the 2035 year and build-out system were negligible in terms of collection system capacity criteria.

6.3.1 Key Causes of Deficiencies

The calibrated hydraulic model was exercised under design storm conditions and predicted results analyzed using the performance criteria to identify segments of the system not meeting that criteria. The key causes triggering deficiencies in the City's collection system include:

- Adverse slopes and misaligned inverts.
- Shallow manholes.
- Pipe restrictions caused by a single or few smaller diameter pipes between larger diameter pipes.
- Pipe diameter not sufficient to convey the PWWF.
- Pump station firm capacity not sufficient to pump the PWWF.
- Backwater condition.

6.3.2 Existing System Problem Areas

For the existing sewer collection system, the PWWF was routed through the hydraulic model to assess performance. In accordance with the established criteria for existing sewers, where the model predicted potential deficiencies, these were identified. In general, the smaller sewer mains further upstream in the system have sufficient capacity to convey existing flows during the design storm. Existing deficiencies are primarily located in Flow Monitoring Basin 5-1-1, with primary capacity issues in the downstream larger trunk lines receiving flow from smaller tributary areas and delivering sewage to NE Adams. Specific manhole locations of these deficiencies are discussed in Section 6.5. Each portion of the system with localized capacity issues is broken into seven different existing system problem areas, further discussed in Section 6.5. Basin 5-1-1 experiences elevated I/I that appears to be the main cause of observed deficiencies along 6th Avenue, Division Street, and NW Fargo Street. The locations of these predicted deficiency problem areas under existing PWWF conditions are shown on Figure 6.2 in red.

6.3.3 Build-Out System Problem Areas

The Service Area scenario (build-out) system analysis was performed in a similar manner to the existing system analysis. The build-out condition evaluated whether or not the sewers would be adequately sized to convey the future PWWFs, including urban reserve areas. This analysis incorporates the preliminary assumptions made for how/where to connect the growth areas to the existing system.

Two additional deficiency problem areas occur during build-out conditions. The additional projected flows from the North Shore area add significant amounts of flow and are predicted to exceed the criteria and cause additional surcharging in the system. Additional growth upstream of 6th Avenue NW causes existing deficiencies to worsen under build-out conditions. The build-out deficiency problem areas are shown in red on Figure 6.3.

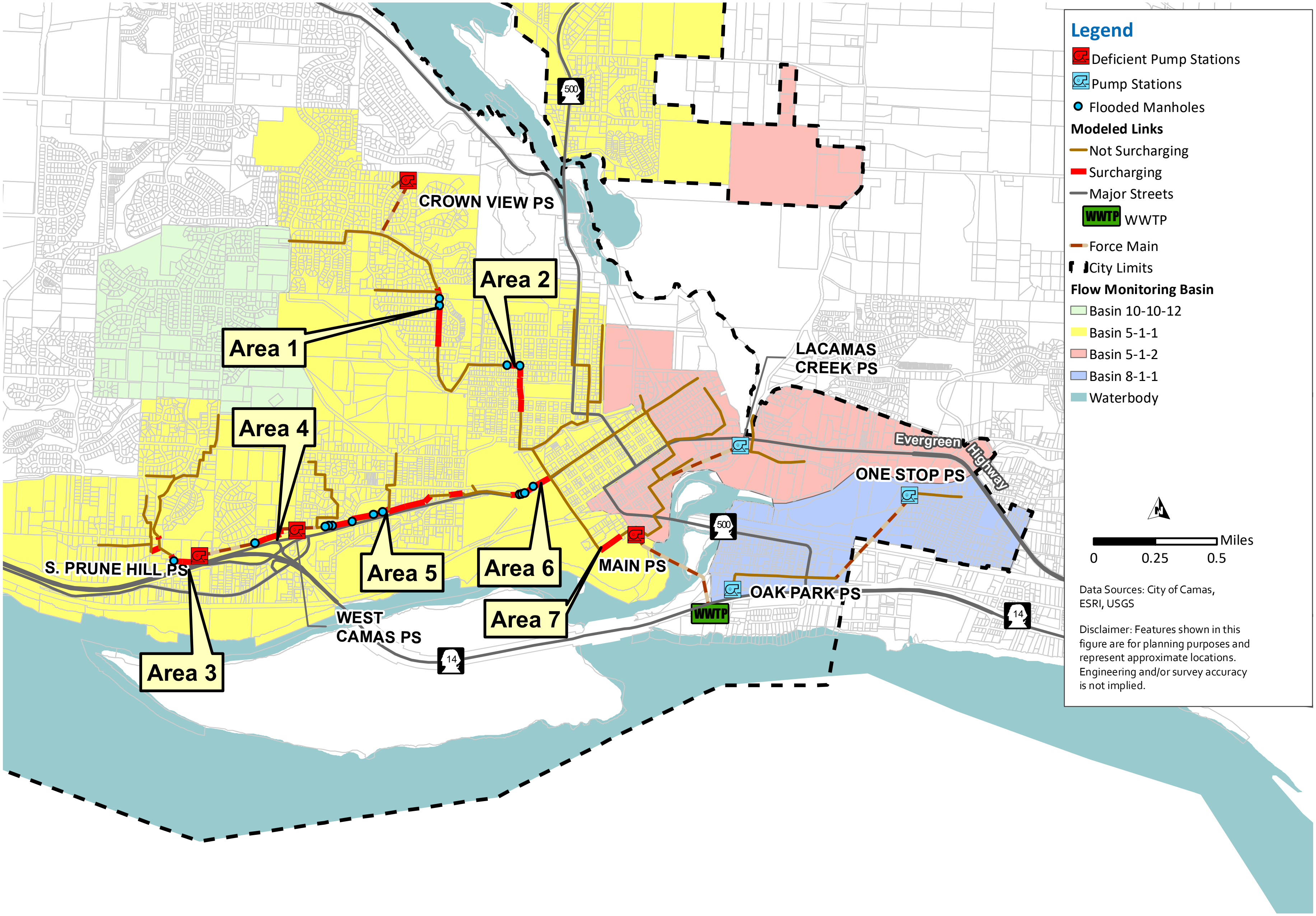


Figure 6.2 Existing Potential Problem Areas and Deficiencies

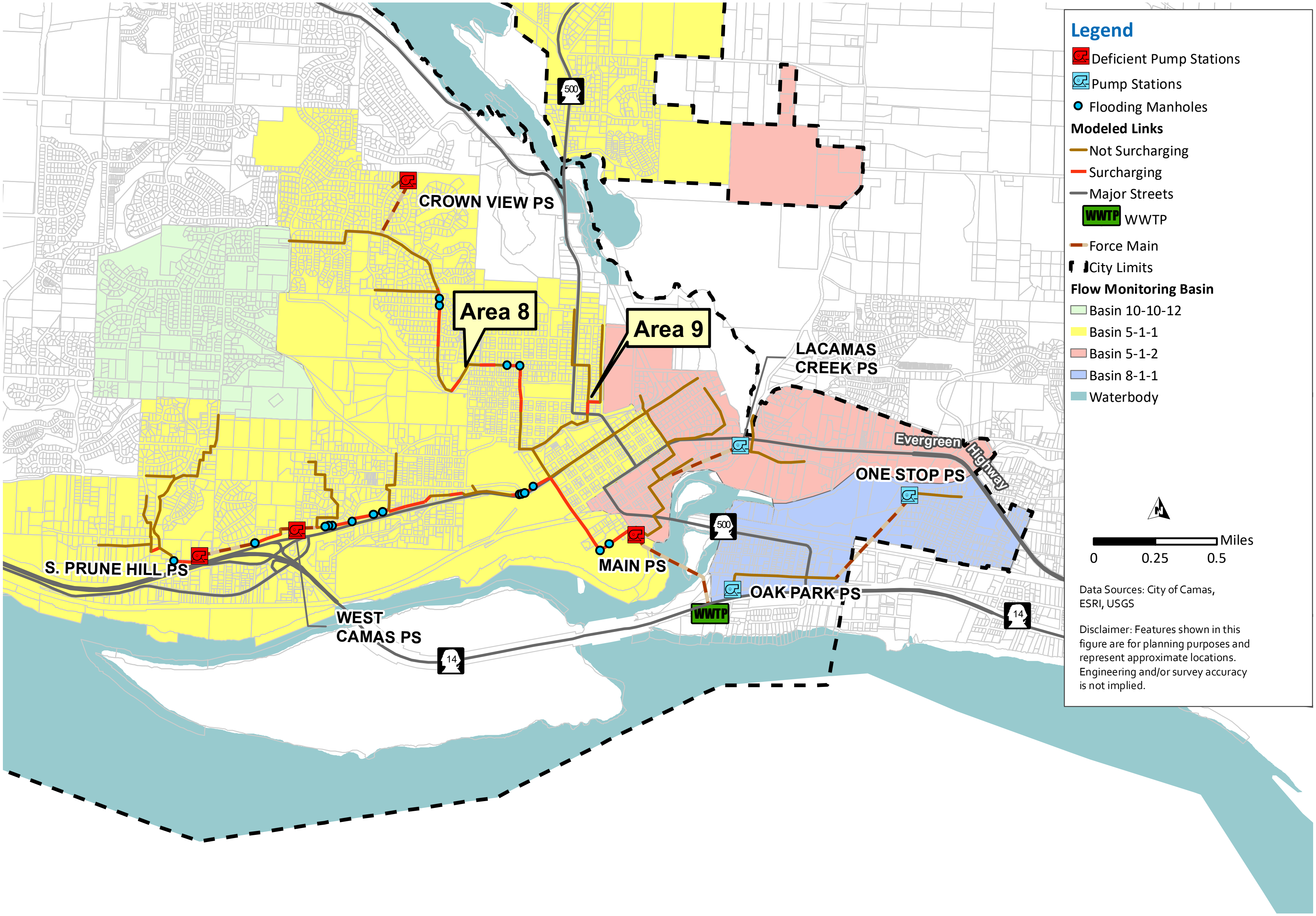


Figure 6.3 Build-Out Potential Problem Areas and Deficiencies

6.4 Pump Station Evaluation

Ensuring that pump stations have adequate capacity to convey peak flows is important to prevent sewage overflows at or near pump stations. In accordance with the established performance criteria, the City's existing pump stations were evaluated using the calibrated system model to determine if each one has available capacity to convey existing and future PWWFs. If a pump station has inadequate capacity to pump the PWWFs, the water level in the wet well may rise to the overflow point, spilling sewage. Pump stations predicted to experience an influent PWWF greater than the existing firm capacity of the station were flagged as deficient. The firm capacity of a pump station is defined as the capacity with the largest pump out of service.

The City's hydraulic model includes five of the seven pump stations located in the City's Gravity Collection System. In addition to the five collection system pump stations included in the model, there are two additional pump stations located just upstream of the WWTF (Oak Park and Main). These two stations were also evaluated utilized existing and projected influent flows, despite not being included in the model. All seven stations are shown in Figure 6.1 in blue. The estimated current and future peak flows were compared the to the pump station firm capacities. Table 6.1 summarizes the results of the pump station evaluation. Figures 6.2 and 6.3 show deficient pump stations in red and pump stations meeting the firm capacity in blue. Firm capacities were based on draw down testing performed by the City. Table 6.1 includes the total capacity at each station, as an additional point of reference for the modeled PWWF's. The total capacity was conservatively assumed to be twice the field measured firm capacity as all stations have two pumps.

Table 6.1 Pump Station Evaluation

Pump Station Name	Firm Capacity (gpm)	Existing Modeled PWWF (gpm)	Build-Out Modeled PWWF (gpm)	Firm Excess Deficiency	Build-Out Excess Deficiency
One Stop	229	67	72	No	No
South Prune Hill	449	1,104	1,113	Yes	Yes
West Camas	579	1,302	1,302	Yes	Yes
Crown View Plaza	148	512	530	Yes	Yes
Lacamas Creek(1)	Current = 346, Build-out = 570	215	525	No	No
Oak Park	426	148	153	No	No
Main	3,851	3,909	5,682	Yes	Yes

Notes:
(1) Lacamas Creek has been design, but not yet constructed. The designed capacity is shown as the 1.27 cfs value for firm capacity. This is used to evaluate the pumps under build-out conditions.
Abbreviations: gpm - gallons per minute; cfs - cubic feet per second.

Based on the analysis and the results presented in Table 6.1, four of the City's pump stations are considered deficient per the City's firm capacity performance criteria. Deficiencies are identified for these four pump stations under existing conditions. These deficiencies are exacerbated under service area build-out conditions.

The collection system model had a simplified set up of the pump stations. Force mains were not included in the model, pumps were setup to discharge into the gravity system at the location of the force main, and associated losses were factored into the pump curves. This setup was consistent with how the model had previously been set up. Future analysis should add force mains to the model, so that force main velocity evaluation can occur. For this plan, no recommendations were made for pump station force mains.

6.4.1 Pump Station Run Times

The gravity collection system model includes only five pump stations and has PWWF information upstream of seven pump stations. The City's STEP system includes 20 pump stations. These stations are not included in the model, therefore no evaluation of performance was available for PWWFs. Historical pump station run times were analyzed for all pump stations to gauge the average capacity of the stations. The station run time data was typically weekly by hour. The number of hours between data points was divided by the number of hours the pump ran to estimate a daily average. This daily average was converted to an annual average for every station. The resulting capacity is displayed in Table 6.2. No conclusions could be made on how pump stations performed during peak wet weather events utilizing the average daily run times. It is difficult to make any determinations from this data, and all stations should undergo additional evaluation to confirm capacity is appropriate to expected wastewater flow conditions.

Table 6.2 STEP Pump Station Percent of Time Running During the Day Based on Pump Hours

Pump Station Name	2014	2015	2016	2017	2018	2019	Potential Capacity Deficiency
Harl	3%	7%	7%	9%	10%	12%	No
Leadbetter	-	-	-	-	1%	1%	No
232nd	-	-	-	-	1%	1%	No
Goodwin	-	-	-	-	1%	2%	No
Two Creeks	3%	3%	3%	4%	3%	5%	No
Camas Meadows	3%	3%	2%	2%	3%	3%	No
Larkspur	2%	3%	3%	4%	5%	2%	No
Lacamas Shores	18%	24%	43%	50%	60%	48%	Yes
Lacamas Meadows	35%	19%	14%	15%	15%	15%	No
Sunningdale Gardens	37%	41%	51%	66%	50%	69%	Yes
Prune Hill Park	6%	6%	6%	6%	6%	6%	No
Hillshire	15%	15%	11%	13%	8%	8%	No
Hunter Ridge	3%	3%	4%	4%	4%	5%	No
Brady Rd	14%	15%	17%	16%	16%	16%	No
Grand Ridge	13%	18%	20%	19%	27%	21%	No
Winchester Hills 2	50%	32%	24%	22%	25%	36%	Yes
Winchester Hills 1	15%	17%	20%	19%	19%	22%	No
Stone Leaf	2%	2%	3%	3%	3%	3%	No
Parker Estates	16%	18%	21%	20%	18%	17%	No
Fisher	1%	1%	1%	1%	1%	2%	No

The relation between average pump station capacities to PWWF depends on the peaking factor of the tributary area, and therefore varies for every station. Considering the limitations in the pump station operational data (daily run times), for the stations identified in Table 6.2, where percent capacity is estimated at 40 percent or higher, the City should assume there is a substantial risk of failing to meet capacity during existing PWWF events. Applying the methodology described herein, Lacamas Shores, Sunningdale Gardens, and Winchester Hills 2 all have exhibited average capacity above 40 percent at some point in the last five years. These stations should be prioritized and undergo future evaluation, possibly including focused flow and pressure monitoring to gain a better understanding of what happens during peak flows and their capacity to inform future capital improvement planning. No future projections were performed for these stations. Future projects should prioritize projecting flows and understanding how the upstream tributary areas of these stations will develop.

6.5 Capacity Evaluation Summary

The City's model predicted several locations where the sewer system may have inadequate capacity for existing PWWF conditions. The deficiencies increase with projected additional growth and City expansion.

Four of the City's seven gravity system pump stations included in the model are considered deficient due to lack of pump redundancy. Additionally, three STEP system pump stations evaluated based on run times may be deficient in the future.

Figures 6.2 and 6.3 highlight the location of system piping and pumping capacity deficiencies identified in this analysis based on the established performance criteria.

Following the completion of the existing, 20 year, and build-out system analysis, improvement projects and alternatives were identified to mitigate capacity deficiencies predicted in the existing and build-out pipeline system. The City has nine localized areas of capacity system deficiencies and four pump stations that will need to be upgraded to meet firm capacity criteria. The following sections describe each of the nine problem areas and the suggested pipeline improvements in addition to proposed pump station upgrades. Figure 6.4 identifies the proposed pipeline improvements for each problem area, discussed in the following sections.

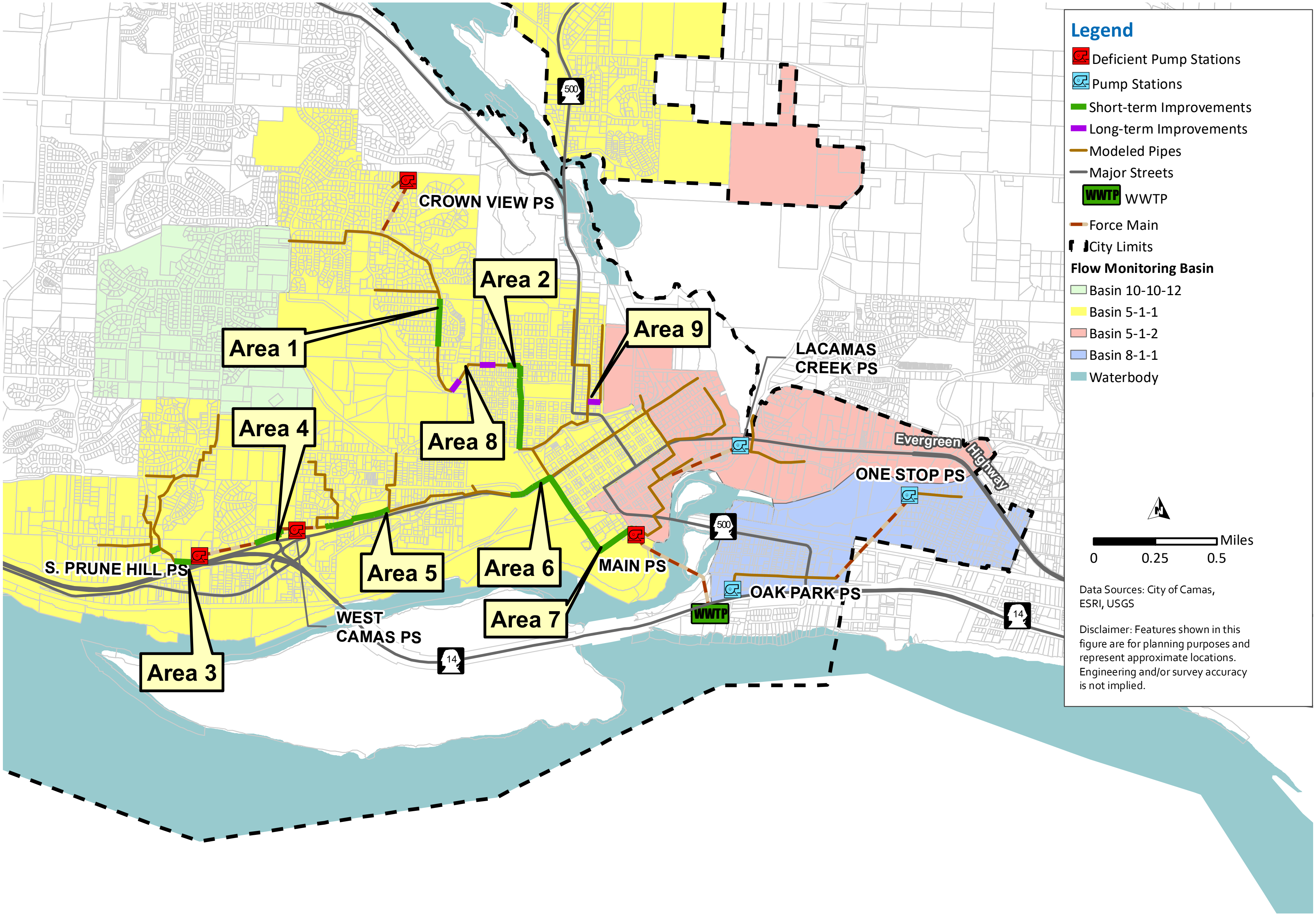


Figure 6.4 Proposed Pipeline Improvements

6.5.1 Area 1

Area 1 experiences surcharging along NW Fargo Street, as illustrated in Figure 6.2, under existing conditions. The model showed potential manhole flooding during the design storm at modeled manholes 3-1-26 and 3-1-25. This deficiency is caused by capacity limitations due to pipe diameter and slope constraints in the reach, as shown in Figure 6.5 of the pipe profile plot with HGL in blue. The proposed improvements to mitigate these deficiencies consist of upsizing pipes between manholes 3-1-26 to 3-1-22 from 8-inch to 12-inch, shown in red on Figure 6.4. This piping upsize effectively alleviates the surcharging and meets the City's design criteria, as illustrated in Figure 6.6.

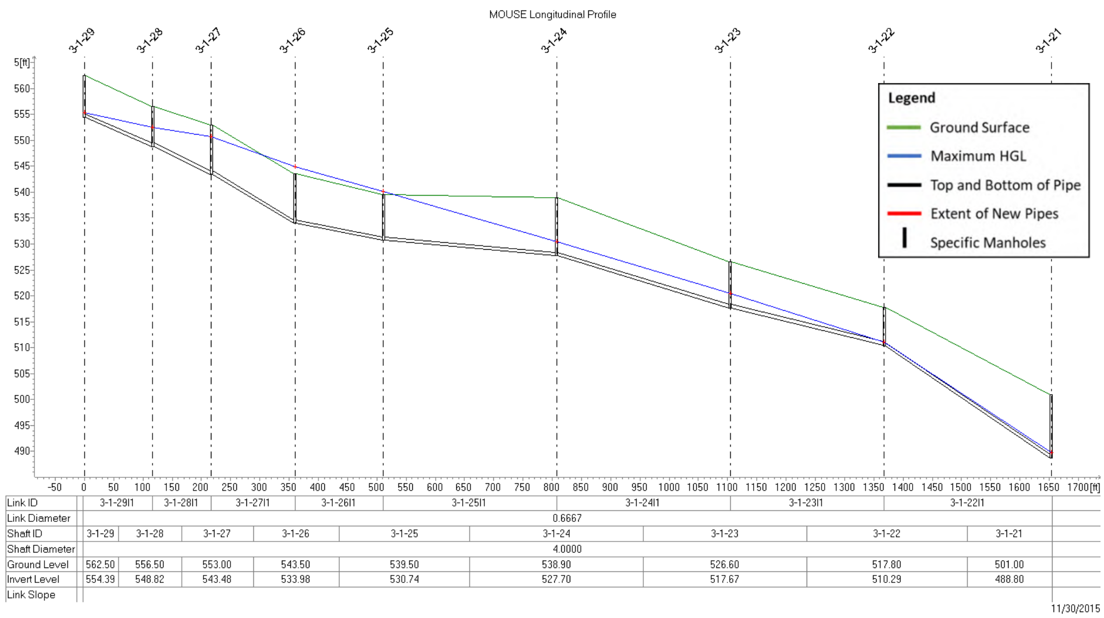


Figure 6.5 Area 1: HGL and Profile Plot

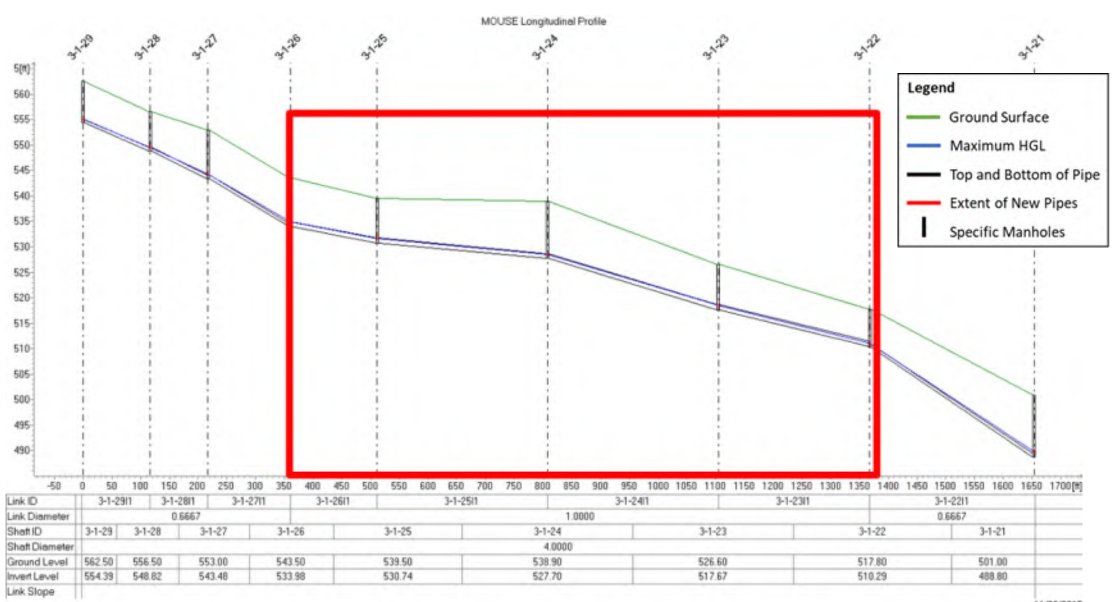


Figure 6.6 Area 1: HGL and Profile Plot after Improvements

6.5.2 Area 2

Area 2 experiences surcharging along Division St, during existing conditions. The model showed potential manhole flooding during the design storm at model manholes 3-1-11, 3-1-10, and 3-1-6. This deficiency is caused by capacity limitations at the lower sloped pipelines in the reach, as shown through the pipe profile plot and HGL on Figure 6.7. The proposed improvements consist of upsizing pipes between manholes 3-1-11 to 3-1-2 from 8-inch to 12-inch, shown boxed in on Figure 6.4. This effectively alleviates the surcharging and meets the City's design criteria, as shown in Figure 6.8.

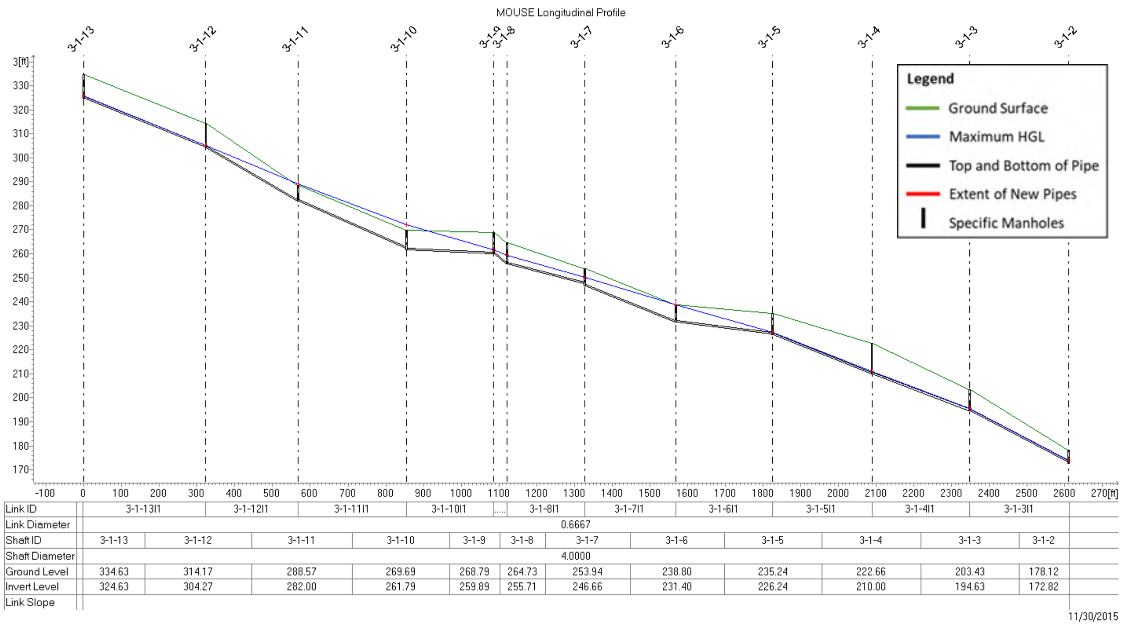


Figure 6.7 Area 2: HGL and Profile Plot

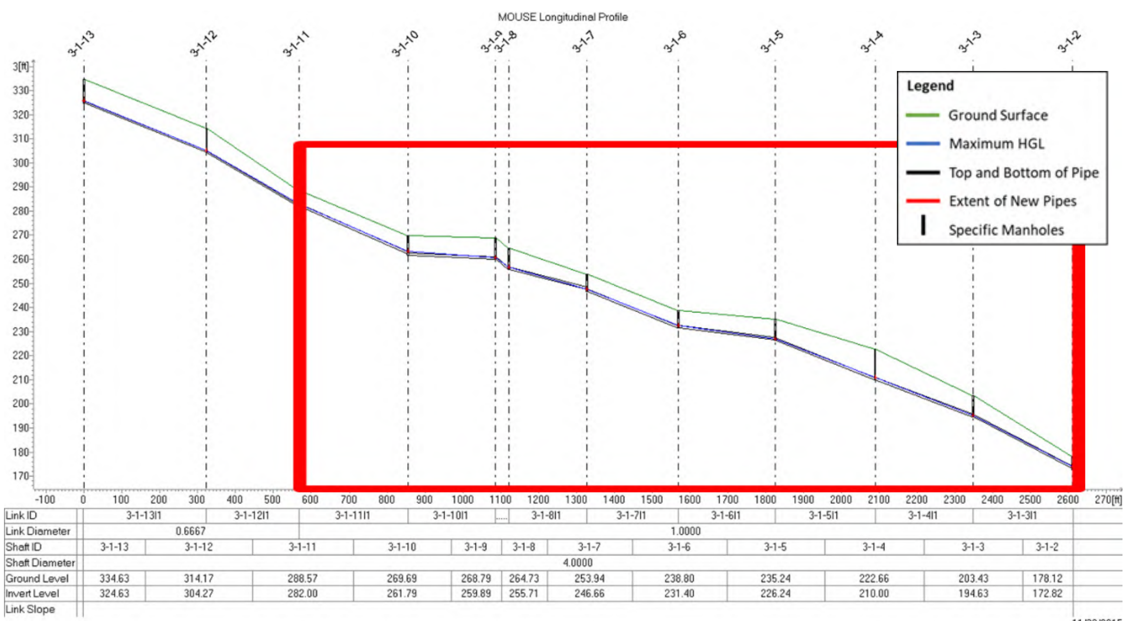


Figure 6.8 Area 2: HGL and Profile Plot after Improvements

6.5.3 Area 3

Area 3 experiences surcharging along NW 6th Place just upstream of the South Prune Hills Pump Station (PS), during existing conditions. The model showed potential manhole flooding during the design storm at manhole 10-1-8. This deficiency is caused by the significant change in grade from the steep upstream slopes to the shallow downstream slope near the pump station. An additional capacity restriction occurs further upstream between manholes 10-1-11 and 10-1-10, due to a shallow slope. This deficiency is shown through the profile plot and HGL in blue on Figure 6.9. The proposed improvements consist of upsizing pipes between manholes 10-1-11 to 10-1-10 from 8-inch to 12-inch and 10-1-8 to 10-1-5 from 10-inch to 12-inch, shown on Figure 6.4. This effectively alleviates the surcharging and meets the City's design criteria, as shown in Figure 6.10.

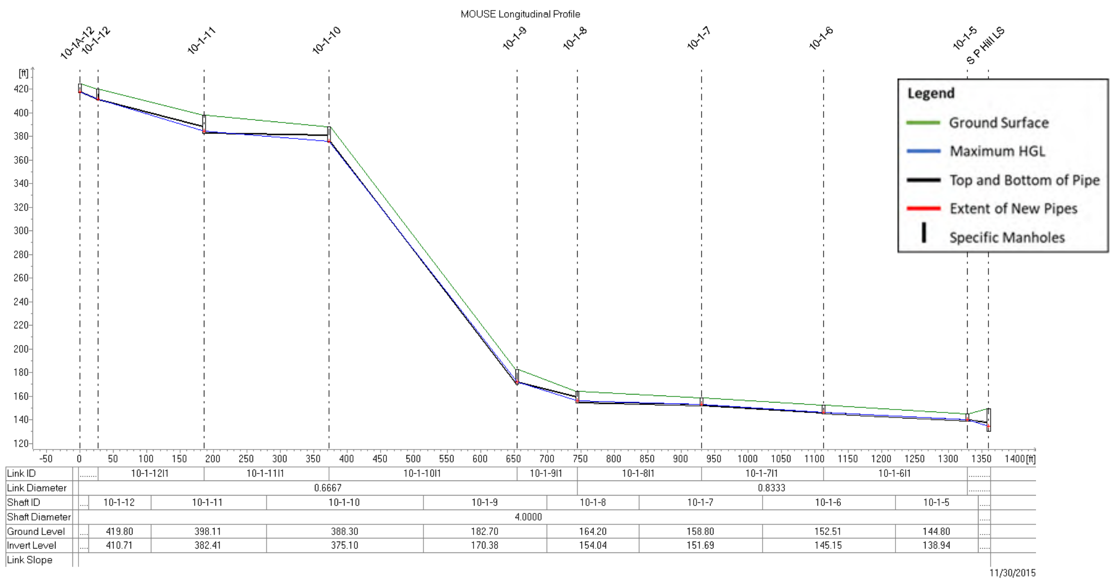


Figure 6.9 Area 3: HGL and Profile Plot

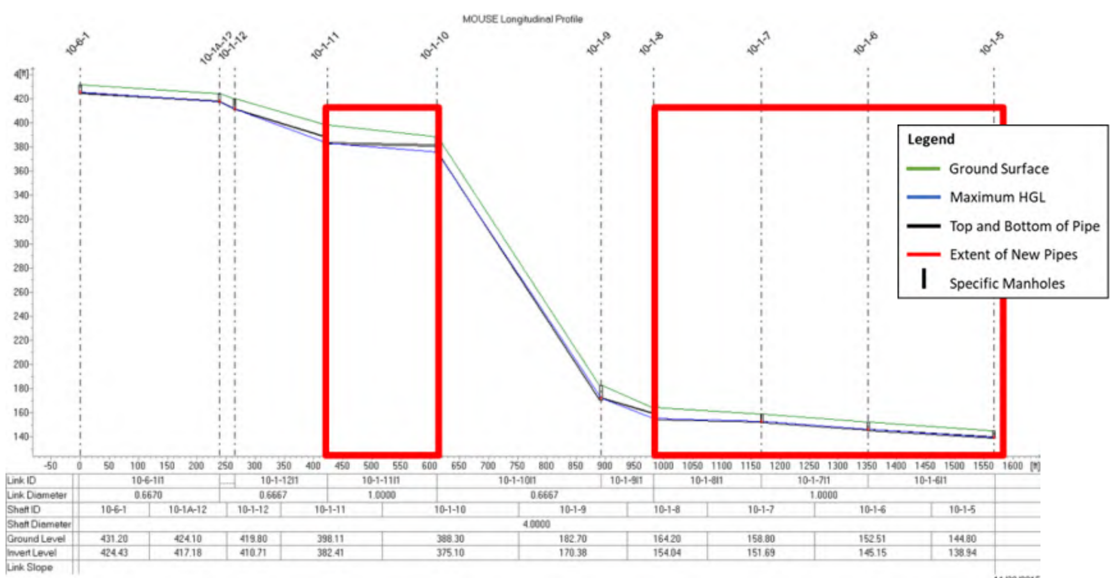


Figure 6.10 Area 3: HGL and Profile Plot after Improvements

Item 3.

6.5.4 Area 4

Area 4 experiences surcharging and flooding along NW 6th Place, shown in Figure 6.2, during existing conditions. The model showed potential manhole flooding during the design storm at manhole 10-1-3, just downstream of the South Prune Hills PS. This deficiency is caused by capacity limitations between the pump stations coupled with backwatering from the West Camas PS. This is shown through the profile plot and HGL in blue on Figure 6.11. The proposed improvements consist of upsizing pipes between manholes 10-1-3 and the West Camas PS wet well from 10-inch to 18-inch, shown on Figure 6.4. This effectively alleviates the surcharging and meets the City's design criteria, as shown in Figure 6.12. Note this deficiency depends upon the timing and extent of the proposed West Camas PS improvements as well, identified in Section 6.4. The results shown above assume that the lift station is upsized to convey its firm capacity.

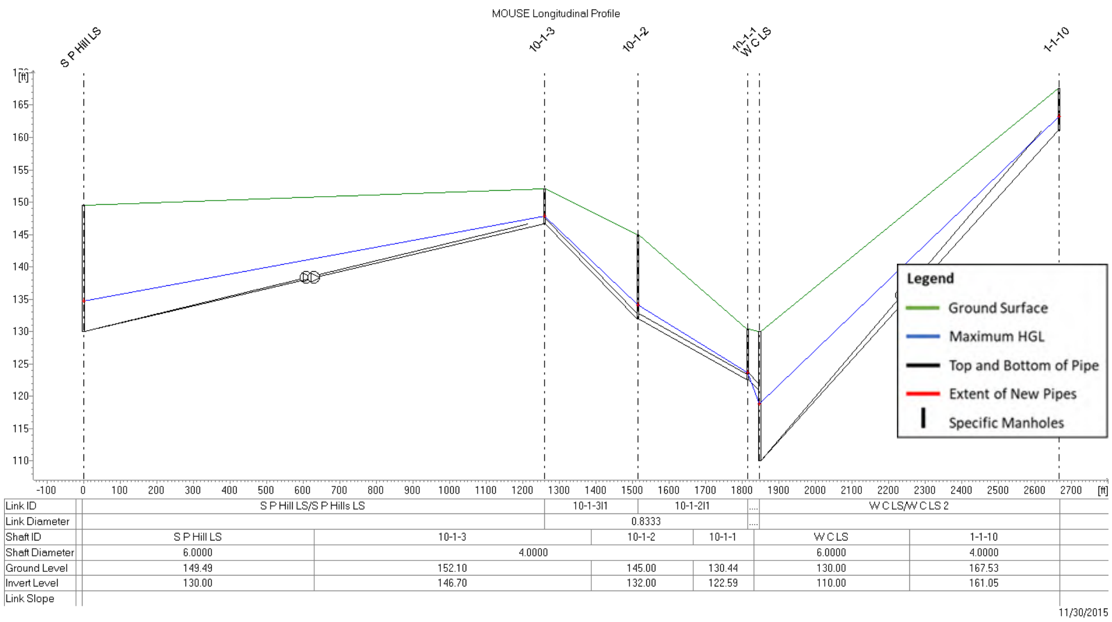


Figure 6.11 Area 4: HGL and Profile Plot

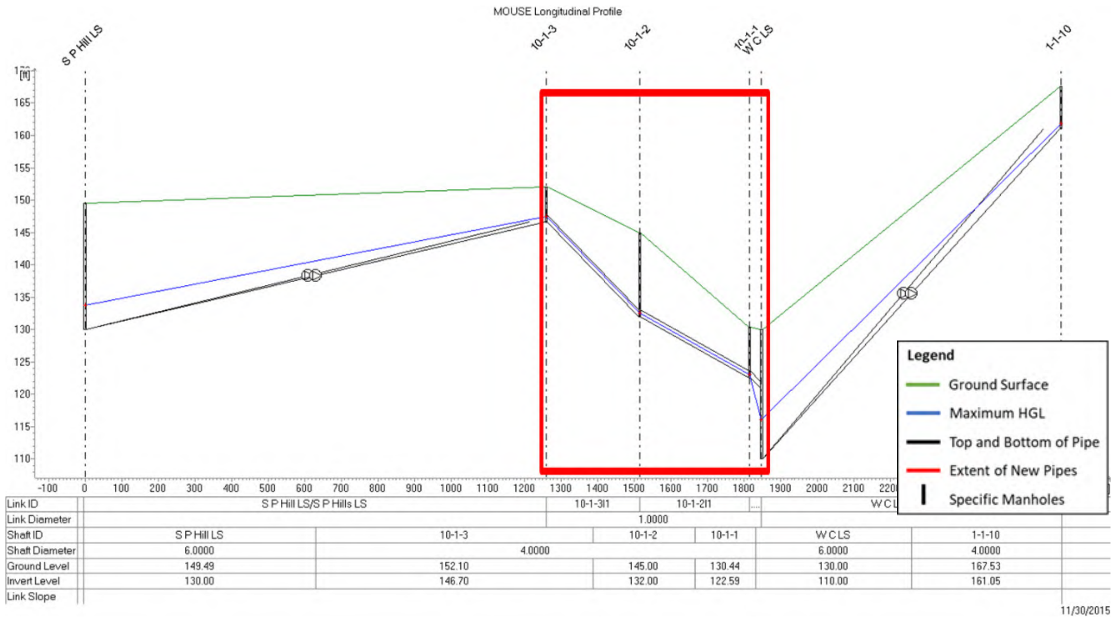


Figure 6.12 Area 4: HGL and Profile Plot after Improvements

6.5.5 Area 5

Area 5 experiences surcharging and flooding downstream of the West Camas PS along NW 6th Place and through Forest Home Park, during existing conditions. The model showed potential manhole flooding during the design storm at manholes 1-1-9, 1-1-8, and 1-1-7. This deficiency is caused by capacity limitations due to both pipe size and slope, as shown in the profile plot and HGL in Figure 6.13. The proposed improvements consist of upsizing pipes between manholes 1-1-9 to 1-1-7 from 12-inch to 15-inch and upsizing pipes between manhole 1-1-7 to 1-1-2 from 12-inch to 18-inch, shown on Figure 6.4. This effectively alleviates the surcharging and meets the City's design criteria, as shown by the HGL in Figure 6.14.

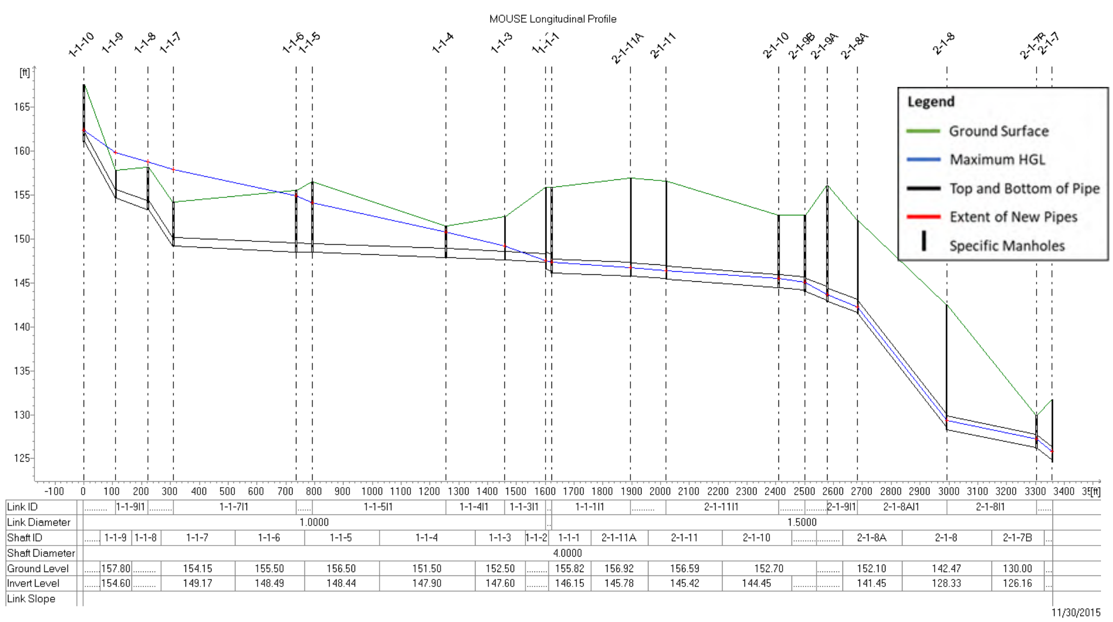


Figure 6.13 Area 5: HGL and Profile Plot

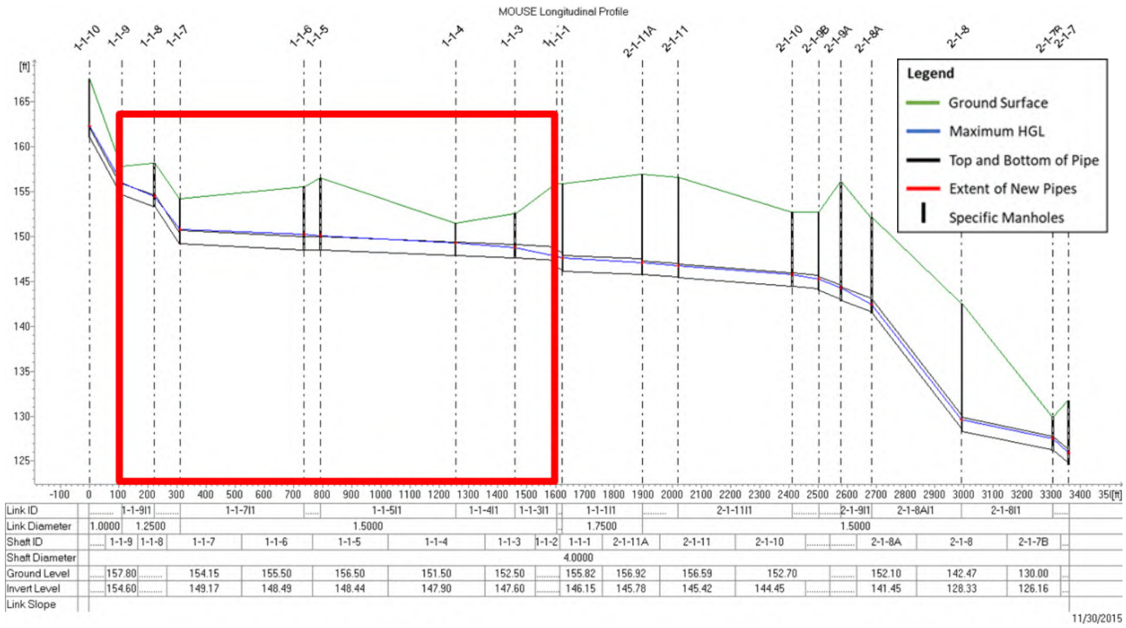


Figure 6.14 Area 5: HGL and Profile Plot after Improvements

6.5.6 Area 6

Area 6 experiences surcharging and flooding along NW Fargo Street, during existing conditions. The model showed no potential manhole flooding during the design storm, however flooding is very close at Manholes 2-1-2. This deficiency is caused by capacity limitations at the lowered sloped pipelines and a drop manhole at 2-1-1. The HGL and pipe profile through the reach is shown in Figure 6.15. The proposed improvements consist of upsizing pipes between manholes 2-1-3 to 2-1-1 from 12-inch to 18-inch, manholes 2-1-1 to 5-1-12 from 12-inch to 21-inch, shown on Figure 6.4. This effectively alleviates the surcharging and meets the City's design criteria, as shown by the HGL in Figure 6.16.

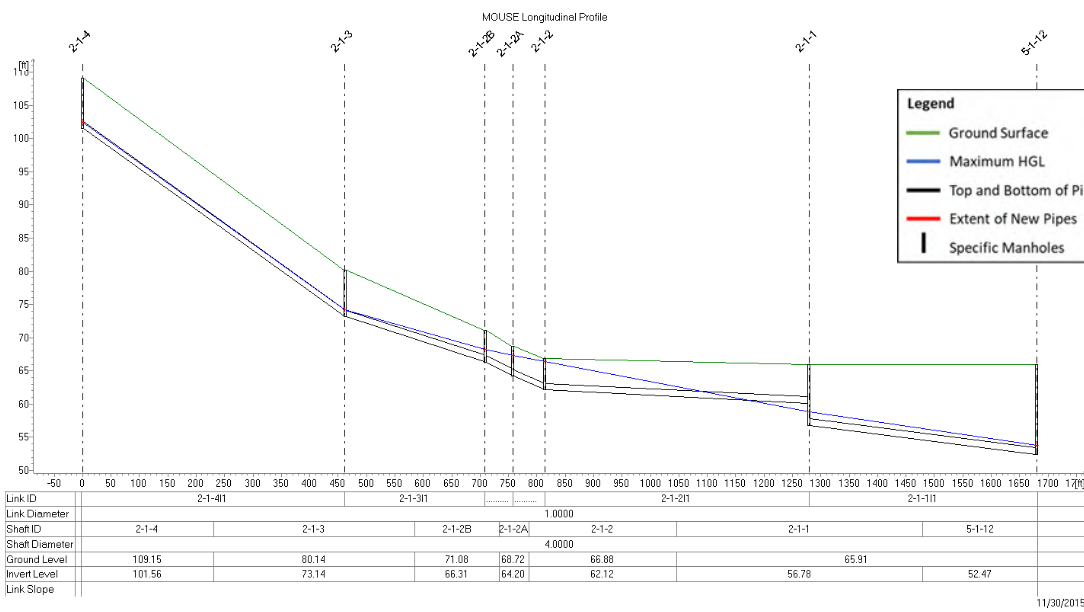


Figure 6.15 Area 6: HGL and Profile Plot

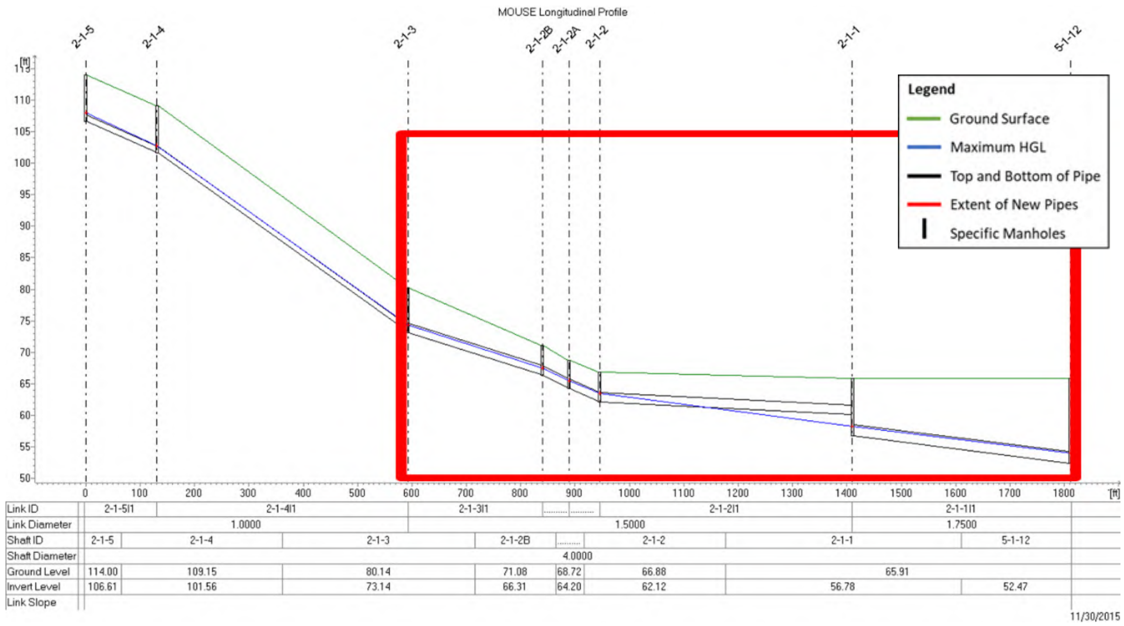


Figure 6.16 Area 6: HGL and Profile Plot after Improvements

6.5.7 Area 7

Area 7 experiences surcharging along SE 3rd Avenue, during existing conditions. Under build-out conditions, additional flows from the North Shore expansion and from 6th Avenue as a result of improvement projects for Areas 3, 4, 5 and 6, the surcharging at Area 7 greatly increases, shown in Figure 6.3. The model showed potential manhole flooding during the design storm for build-out conditions with upstream capacity improvements at manholes 5-1-5 and 5-1-6. This deficiency is caused by capacity limitations due to pipe slope constraints. This is shown through the profile plot and HGL in blue on Figure 6.18. Figure 6.17 shows the profile under existing conditions where the surcharging is less severe. The proposed improvements consist of upsizing pipes between manholes 5-1-10 to 5-1-12 from 21-inch to 24-inch, manholes 5-1-10 to 5-1-8 from 24-inch to 27-inch, manholes 5-1-8 to 5-1-6 from 21-inch to 24-inch, manholes 5-1-6 to 5-1-2 from 24-inch to 27-inch, shown on Figure 6.4. This effectively alleviates the surcharging and meets the City's design criteria, as shown by the HGL in Figure 6.19.

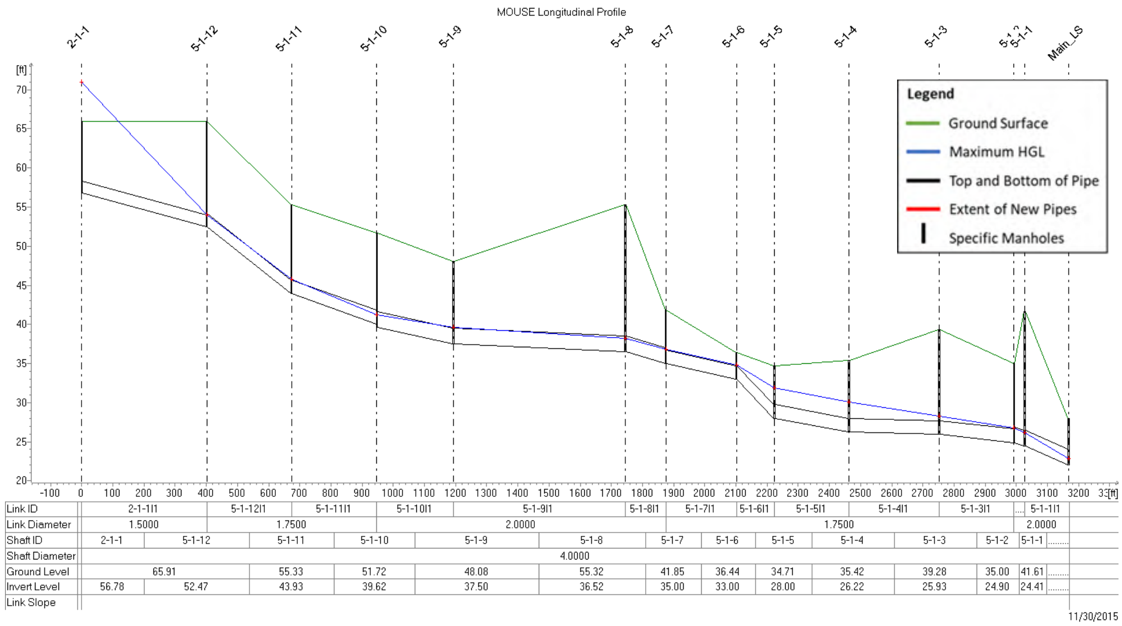


Figure 6.17 Area 7: HGL and Profile Plot Under Existing Conditions

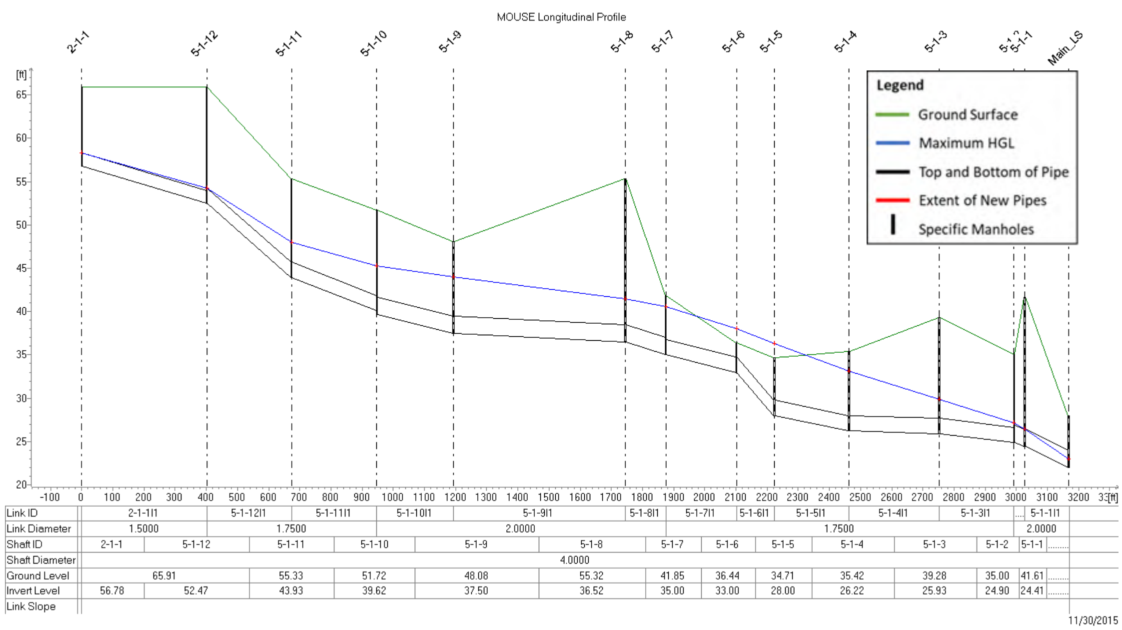


Figure 6.18 Area 7: HGL and Profile Plot under Build-Out Conditions with Upstream Improvement Projects Completed

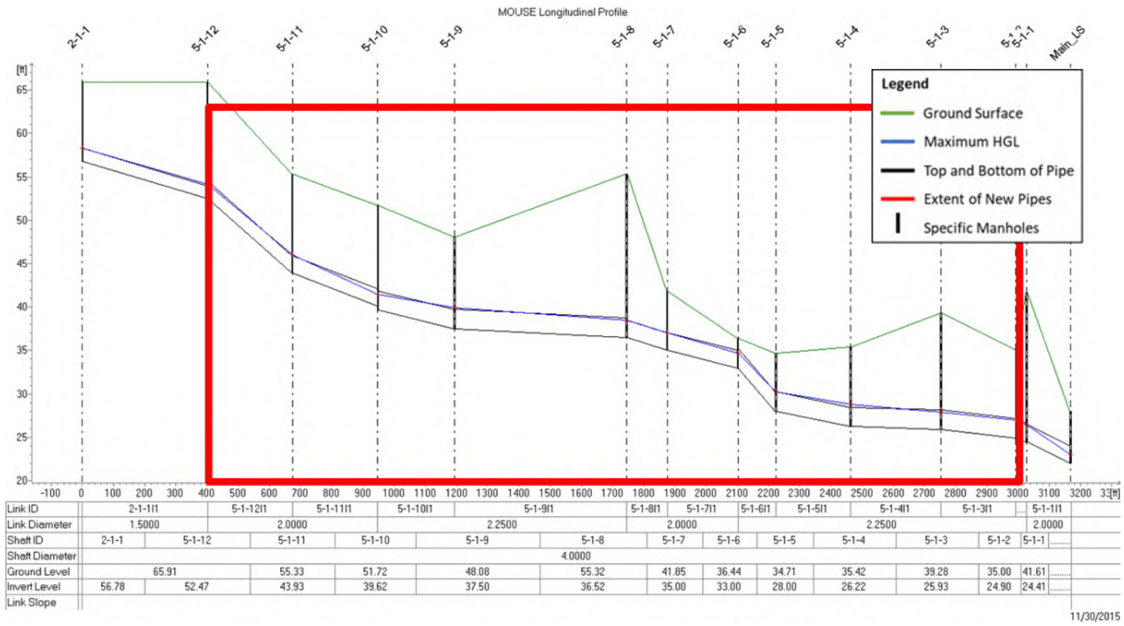


Figure 6.19 Area 7: HGL and Profile Plot under Build-Out Conditions with All Improvement Projects Completed

6.5.8 Area 8

Area 8 experiences surcharging along NW 18th Loop, during build-out conditions. There is no risk of flooding. This deficiency is caused by increased flows under future conditions which cause capacity issues. This is shown through the profile plot and HGL in blue on Figure 6.20. The proposed improvements consist of upsizing pipes between manholes 3-1-1 to 3-1-16 and manhole 3-1-13 to 3-1-12, from 8-inch to 12-inch, shown on Figure 6.4. This effectively alleviates the surcharging and meets the City's design criteria, as shown by the HGL in Figure 6.21.

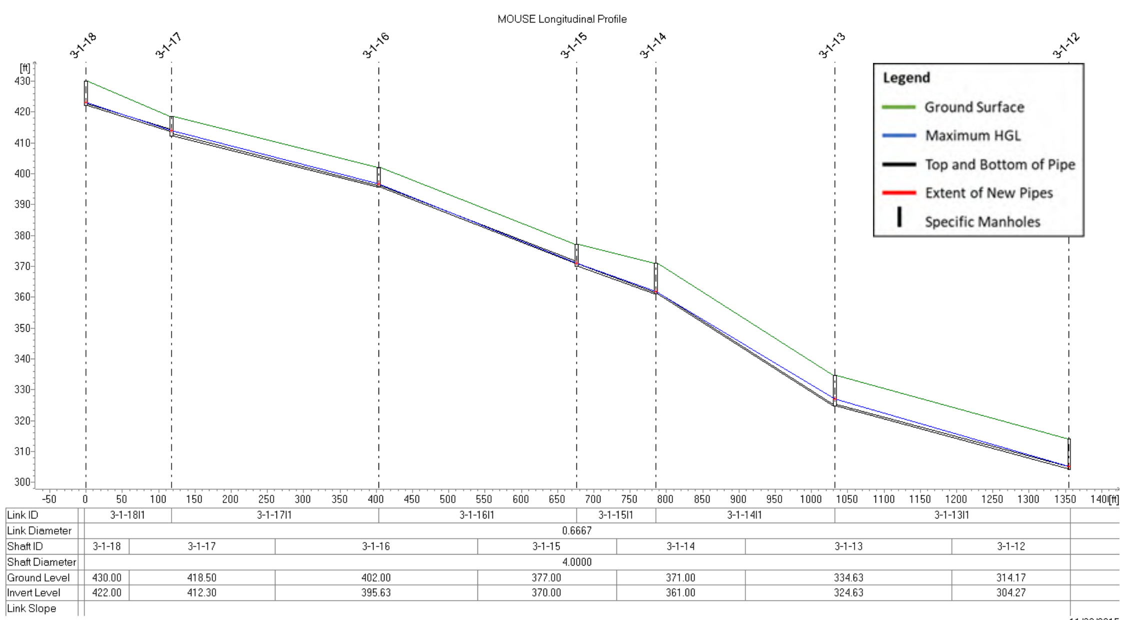


Figure 6.20 Area 8: HGL and Profile Plot under Build-Out Conditions

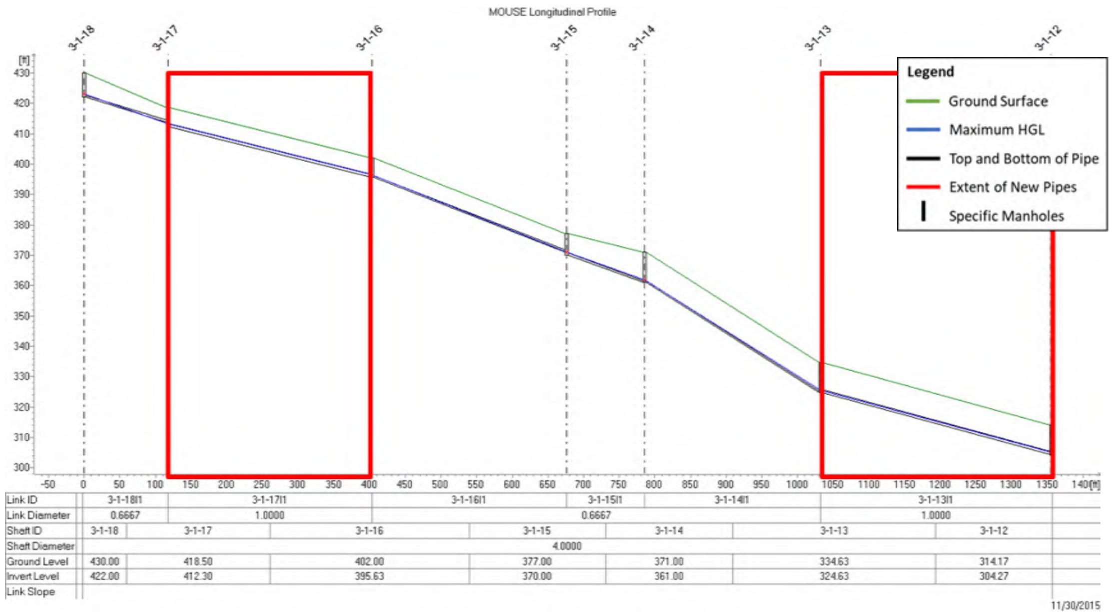


Figure 6.21 Area 8: HGL and Profile Plot under Build-Out Conditions, with Improvement Project

6.5.9 Area 9

Area 9 experiences surcharging along NE 15th Avenue between NE Garfield Street and NE Franklin Street, during build-out conditions. There is no risk of flooding. This deficiency is caused by increased flows under future conditions which cause capacity issues. This is shown through the profile plot and HGL in blue on Figure 6.22. The proposed improvements consist of upsizing pipes between manholes 4-1-2 to 4-2-1, from 8-inch to 18-inch, shown on Figure 6.4. This effectively alleviates the surcharging and meets the City's design criteria, as shown by the HGL in Figure 6.23. There is no threat of surcharging, so fixing this deficiency is a low priority and long-term project.

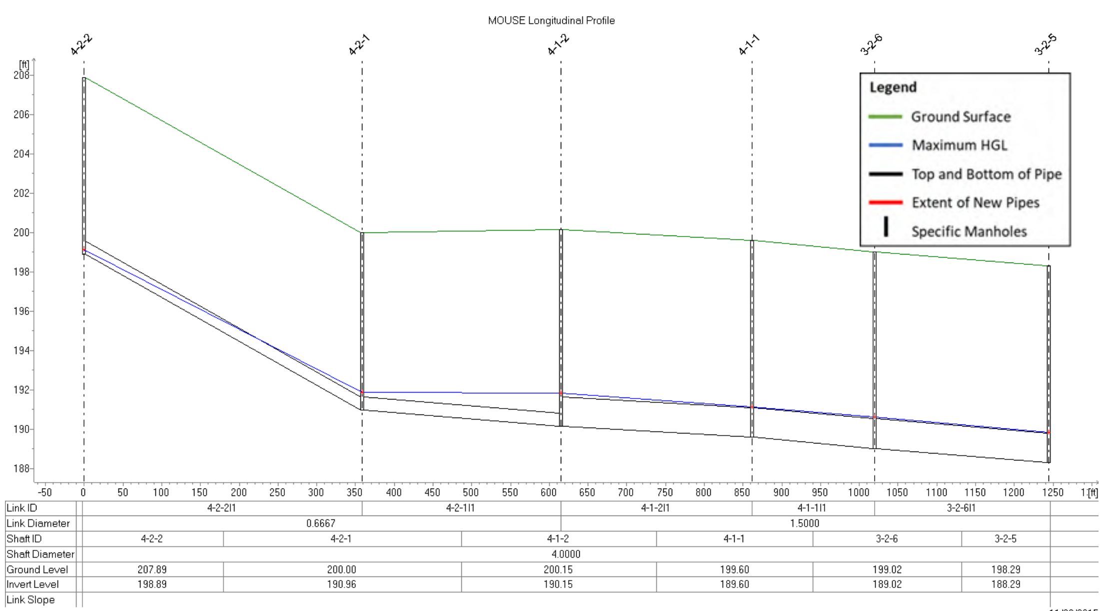


Figure 6.22 Area 9: HGL and Profile Plot under Build-out Conditions

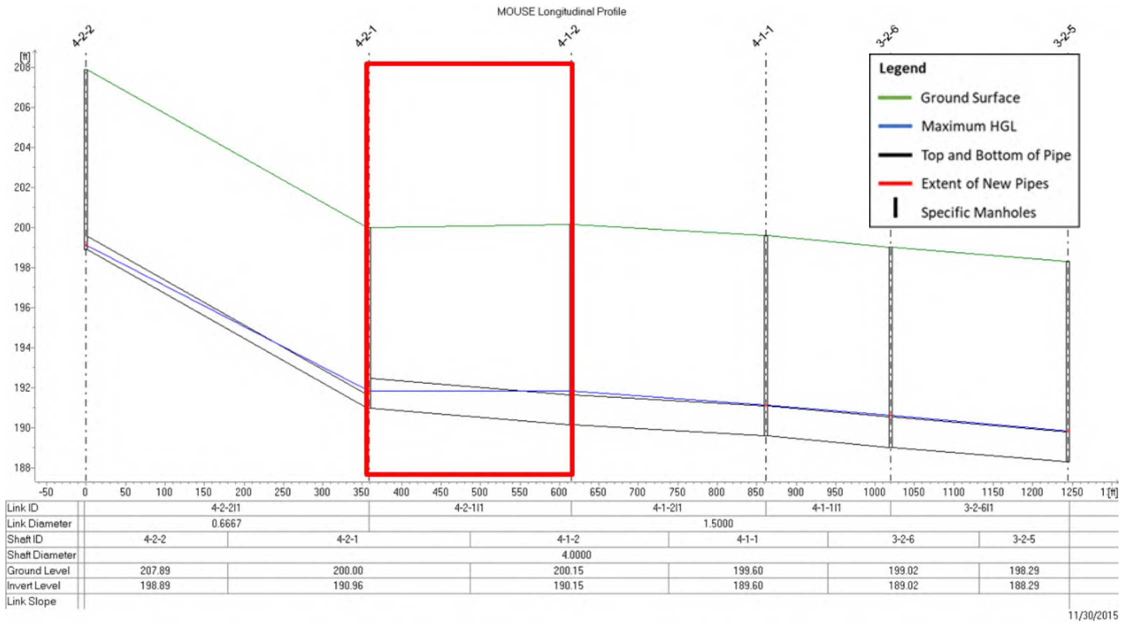


Figure 6.23 Area 9: HGL and Profile Plot under Build-out Conditions, with Improvement Project

6.6 Recommended Collection System Improvements

A number of recommended gravity collection system improvement projects for both pipes and pump stations have been identified to mitigate potential existing, 2035 Year Planning Horizon, and build-out deficiencies and to serve future users. The pipeline improvement projects were described in Section 6.5 and are summarized in Section 6.6.1. Pump Station Improvements are summarized in Section 6.6.2.

Figure 6.4, Table 6.3, and Table 6.4 identify the location and relevant components of the recommended system improvement projects. Table 6.3 and 6.4 referenced details of the improvement (length, diameter, street location, etc.). The improvements summarized in Table 6.3 and 6.4 utilize a numbering system cross-referenced with Figure 6.4. The deficiencies addressed by each project are explained in Section 6.5. The columns used in Table 6.3 and 6.4 refer to the following:

- Project ID: Assigned unique identifier associated with each improvement project. This is an alphanumeric number that starts with one letter indicating the type of improvement P= Pipe, PS = Pump Station, and continues with a number and a letter.
- Improvement Type: Gravity pipelines or pump stations.
- Location: Street in which the improvement is proposed.
- Existing Size: This represents the diameter of the existing pipelines (inches), or the total capacity of existing pump stations (million gallons per day [mgd]).
- Proposed Size: This represents the diameter of the proposed pipelines, or the total capacity of pump stations after proposed improvement, or upon construction if a new facility to serve future growth.

- Length: Estimated length of the proposed improvement in feet. It should be noted that the length estimates do not account for re-routing the alignment to avoid unknown conditions, if more detailed planning and design identifies such constraints.
- Phase: Phase in which the improvement is recommended. Improvements are recommended either for Short-term (Existing) or Long-term (2035 Year Planning Horizon or Build-out).

All proposed improvement projects are allocated to Short-Term (Existing Deficiency) and Long-Term (Build-out deficiency or no risk of flooding) phases based on when the model scenarios predict they are required. Detailed project prioritization based on condition of pipes and funding availability is presented separately in Chapter 9 - CIP and Chapter 10 - Financial Analysis. The two planning phases can be further described as follows:

- Short-term (2022-2031): Proposed facilities that alleviate deficiencies under existing flow conditions.
- Long-term (2032 - 2041): Proposed facilities that alleviate deficiencies for estimated 2035 or UGB flows and proposed facilities to serve service area expansion required under build-out conditions.

The projects were phased based on the best available information for how the City plans to develop moving forward. The actual implementation of the improvements serving future users ultimately depends on growth. The phasing presented below are estimates and will change with the City's planning assumptions or growth projections. Table 6.3 and 6.4 show all collection system projects allocated to the two planning periods.

6.6.1 Recommended Pipeline Improvements

Certain proposed improvements will serve future users, even when an improvement calls for the upgrade of an existing facility. In these cases, an existing sewer or pump station may have sufficient capacity to convey current PWWFs, but as growth continues and more users are added to the system, the increased flow results in capacity deficiencies. These projects, as well as new trunk sewers to extend sewer collection system service to future growth areas, are future improvements.

In most cases, a project is needed to correct an existing capacity deficiency but is sized to accommodate additional flows from future development.

Table 6.3 Recommended Pipe Capacity Projects

Project ID	Improvement Type	Location	Existing Size (inch)	Proposed Size (inch)	Length (feet)	Phase
P-1	Gravity	NW Fargo Street between NW 23rd and NW 19th Avenue	8	12	1,007	Short-term
P-2	Gravity	Division Street between NW 18th and NW 11th Avenue	8	12	2,043	Short-term
P-3	Gravity	NW 6th Place, just upstream of South Prune Hills PS	8 10	12 12	188 616	Short-term
P-4	Gravity	NW 6th Place between South Prune Hills PS and West Camas PS	10	12	588	Short-term
P-5	Gravity	NW 6th Avenue downstream of West Camas PS and through Forest Home Park	12 12	15 18	311 1,340	Short-term
P-6	Gravity	NW 6th Avenue between NW 7th Avenue and SE Adams Street	12 8	18 21	817 401	Short-term
P-7	Gravity	NE and SE Adams Street between SE 3rd Avenue and NW 6th Avenue	21 24	24 27	773 925	Short-term
P-8	Gravity	NW 18th Loop	8	12	609	Long-term
P-9	Gravity	NE 15th Avenue between NE Garfield Street and NE Franklin Street	8	18	256	Long-term

6.6.2 Recommended Pump Station Improvements

It is recommended that the Main, South Prune Hill, West Camas, and Crown View Plaza PSs all be upgraded to provide pump redundancy under existing conditions. These stations do not meet the required firm capacity, based on the City's performance criteria. It is recommended that the City improve these pump stations through addition of redundant pumps. Table 6.4 shows the recommended pump station improvements.

Table 6.4 Recommended Pump Station Improvement Projects

Project ID	Improvement Type	Location	Description	Phase
PS-1	Gravity	South Prune Hills	Add pump capable of pumping 664 gpm	Existing
PS-2	Gravity	West Camas	Add pump capable of pumping 723 gpm	Existing
PS-3	Gravity	Crown View Hill	Add pump capable of pumping 382 gpm.	Existing
PS-4	Gravity	Main	Add pump capable of pumping 1,831 gpm.	Existing
PS-5	Gravity	Lacamas Shores, Sunningdale Gardens, Winchester Hills 2	Add flow monitors and pressure sensors to get a better understanding of what happens during peak flows and their capacity to aid in future capital improvement planning	Existing

6.7 Recommended Collection System Future Projects

Our collection system evaluation was limited to the collection system that was modeled. The collection system includes gravity and STEP elements, but only portions of the gravity system and none of the STEP system were set up for capacity evaluation with the hydraulic model. There was insufficient data to evaluate the STEP system; therefore, specific improvement projects were not developed. Other factors such as limited pump telemetry and a lack of extensive city-wide geographic information system (GIS) limited the scope of the collection system evaluation. The following bullet points explain future projects the City should undergo to allow more effective evaluation of the gravity and STEP system, respectively:

- **Gravity Collection System Model:** The gravity collection system model is skeletonized, only 24 percent of the gravity system pipes and none of the force mains are included. While most of the critical trunks are included, a full pipe or less skeletonized model is needed for a more robust evaluation of the system. In order to expand the model, accurate and updated GIS for the collection system should be developed.
- **Gravity Pump Station Instrumentation:** The lack of pump station instrumentation limited the extent stations could be evaluated. The City conducted draw down testing that resulted in lower capacities than previous modeling concluded. It is recommended that the City improve instrumentation of these stations to better understand the reasons for these revisions.

- **STEP Main Flows:** As discussed in Chapter 7, with the City's combined treatment plant influent monitoring restricted the ability to separate out STEP flows from Gravity System Flows with a high degree of confidence. Recently, this issue was resolved and future monitoring will allow a greater understanding of the STEP Main flows. If Oak and Main PSs are flow metered, the STEP system flow can be determined. A future study is recommended once sufficient historical data is available.
- **STEP Main Modeling:** The STEP system should be added to the collection system model in order to evaluate that portion of the system. Additional metering at pump stations further upstream would allow proper calibration of the STEP portion of the model. While these pump stations would not need to be included in the model. Accurate data on Pump Station inflows to the STEP system would need to be determined. The addition of a manhole with a flow meter near NW Lake Rd and NW Lacamas Drive or NW Parker Street and NW Knapp Lane to aid in calibration should also be considered. Figure 6.24 shows the potential overview of a STEP main model, in dark grey, and proposed monitoring locations to add to the STEP system. Inflows are shown in orange and black triangles. These inflows are based on the Gray and Osborne 2009 General Sewer Plan Appendix F, Figure F-1. These inflows give an overview of where additional monitoring could be implemented in order to further refine the system during STEP model calibration.
- **STEP Main Condition Assessment:** The addition of manholes to the STEP system would help facilitate investigation of the STEP mains condition and allow any partially obstructed portion of the STEP Main to be identified. A future investigation of debris, solids, and other obstruction is recommended in the sags in the system.
- **STEP System Lift Stations:** The STEP System Lift stations could not be evaluated under PWWF events using the system model, due to a lack of data. Supervisory control and data acquisition (SCADA) with historian capabilities would assist with the evaluation of all stations and determining pump run times at these stations. Based on the City's pump station run time tests, a representative peak flow could be determined. This program should start with the most at risk stations defined in Section 6.4, and expand to all city owned pump stations.

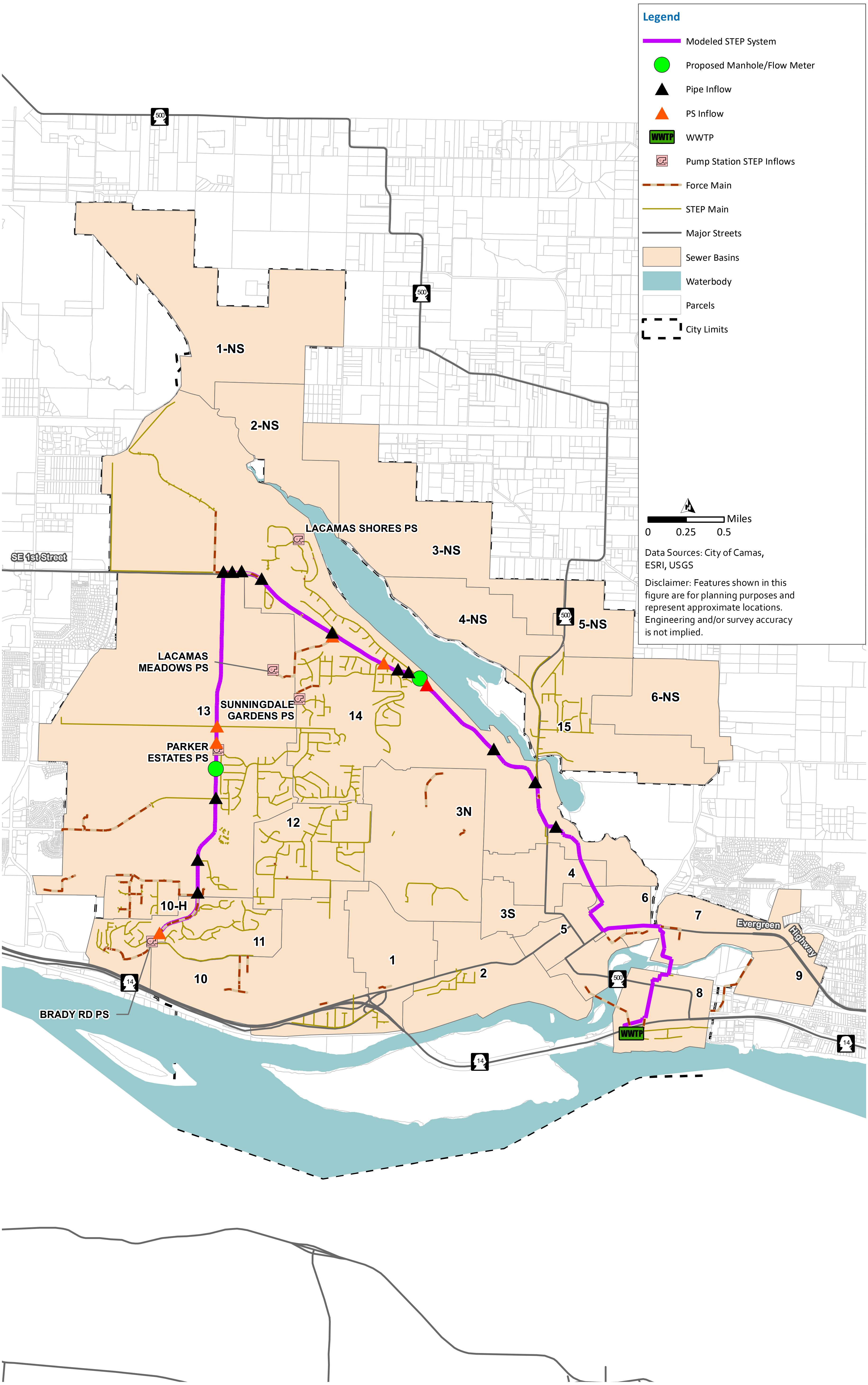


Figure 6.24 Overview of Potential STEP Main Model

Chapter 7

WASTEWATER TREATMENT FACILITY

7.1 Introduction

The City of Camas (City) serves the water quality needs of approximately 8,500 residential, industrial, and commercial accounts by maintaining and operating their wastewater treatment facility (WWTF) which has a maximum month design flow of 6.1 million gallons per day (mgd).

To support development of the City's General Sewer Plan (the Plan), a unit process analysis was completed to identify shortfalls in plant capacity that will prevent the City from reliably treating and disposing of projected flow and loads at the end of the planning period (i.e., year 2035). To address the identified deficiencies, an alternatives analysis of the most viable improvement options was conducted, which resulted in the development of 14 projects to be incorporated into the general sewer plan's capital improvement program (CIP).

This chapter summarizes the methods and results of these tasks, thus defining the condition and capacities of the WWTF's unit processes and presenting sequenced recommendations that will allow the City to reliably and cost-effectively serve their customers now and into the future.

7.1.1 Current National Pollution Discharge Elimination System Permit

The City's WWTF effluent must comply with limits on biological oxygen demand, total suspended solids, ammonia, pH, and fecal coliform bacteria as conditions of their National Pollutant Discharge Elimination System (NPDES) permit. The current permit, Permit Number (No.) WA0020249, was issued in 2015 effective through September 2020. The City began coordinating with the Washington Department of Ecology (Ecology) to request a permit extension in March 2020, but a formal extension or new permit has not been issued as of January 2022. The City will continue to work with Ecology to extend or renew their NPDES permit and will continue to comply with their current discharge limits, which are summarized in Table 7.1.

Table 7.1 NPDES Permit Effluent Limits for Permit No. WA0020249

NPDES Permit Effluent Limits		
Parameter	**Average Monthly**	**Average Weekly**
Biological oxygen demand (BOD_5)	• 20 mg/L • 1,017 ppd • 74% removal	• 30 mg/L • 1,525 ppd
Total suspended solids (TSS)	• 20 mg/L • 1,017 ppd • 76% removal	• 30 mg/L • 1,525 ppd
Ammonia (NH3 as N) during summer(1)	• 20 mg/L	-
Ammonia (NH3 as N) during winter(2)	• 7 mg/L	-
Parameter	**Minimum**	**Maximum**
pH	• 6 SU	• 9 SU
Parameter	**Monthly Geometric Mean**	**7-Day Geometric Mean**
Fecal coliform bacteria	• 200/100 mL	• 400/100 mL

Notes:
(1) Summer months include June through July.
(2) Winter months include October through May (inclusively).
Abbreviations: BOD_5 - five-day biochemical oxygen demand; mg/L - milligrams per liter; mL - milliliter; ppd - pounds per day; SU - standard units.

7.1.2 Past Evaluation of Reuse

In the 2010 iteration of the general sewer plan, the City explored their potential to practice wastewater reclamation, or the production and beneficial use of reclaimed water. As such, an evaluation was completed to understand the feasibility of reusing effluent from the WWTF or constructing a new water reclamation facility (WRF) to treat wastewater for reuse.

The evaluation determined that, though environmental and social benefits are difficult to quantify and assess, the City and their surrounding communities can benefit indirectly from the use of reclaimed water in the following ways:

- Development of additional outdoor recreational sites for the community.
- Irrigation of parks and playfields, which can potentially increase property values.
- Conservation of the quality and quantity of the City's water resources.
- A flexible and reliable alternative water source for industrial water customers.

However, the evaluation also confirmed that the production of reclaimed water is only economically feasible if the cost of producing reclaimed water is less than or equal to the cost of purchasing water or developing additional water rights.

Capital, operation, and maintenance costs for the two alternatives were taken from the 2010 general sewer plan and converted from 2006 dollars to 2021 dollars. A new 20-year present worth analysis was conducted with the updated values. Both the 2010 general sewer plan and the current 20-year present worth analysis found that neither the costs to modify the existing WWTF nor construct a satellite WRF were less than or equal to the cost of developing additional water rights, which are available at notably lower costs. The cost to develop and acquire additional water rights was expected to not exceed 5 million dollars in 2006 which would be 7.9 million dollars in 2021.

Comparisons of the two alternatives are shown in Table 7.2. Alternative 1 has a 20-year present worth of $15.8 million dollars and alternative 2 has a 20-year present worth of $42.6 million dollars. Both alternatives are considerably larger than the 7.9 million dollars to develop and acquire additional water rights. Therefore, water reclamation and reuse were determined to be economically infeasible at this time and not pursued at the City's WWTF.

Chapter 10 of the *2010 General Sewer/Wastewater Facility Plan* (Gray & Osbourne, Inc. 2010) documents the feasibility evaluation of reuse in further detail.

Table 7.2 Reuse Alternative Cost Comparison

	Alternative 1 Modify Existing WWTF	Alternative 2 Construct Satellite WRF
Capital Cost(1)	$12,837,000	$35,878,000
Annual O&M Cost(2)	$157,700	$350,500
20-year Present Worth(3)	$15,841,000	$42,554,000

Notes:
(1) 2010 general sewer plan used 2006 costs. The ENR CCI 20-City Average for June 2006 and June 2021 were used.
(2) 2010 general sewer plan reported 2004 costs. Costs were updated using the ENR CCI 20-City Average for March 2004.
(3) Discount rate assumed 5% bond repayment rate and 4% inflation for a total rate of 1%.
Abbreviations: O&M - operations and maintenance.

7.2 Unit Process Analysis

A unit process analysis comparing the design or rated capacity of each WWTF unit process against its requisite treatment demands under current and projected flows and loads. This comparison identified deficiencies or limitations in the plant's current installed capacity to meet its various regulatory and operational requirements by 2035.

To this end, the unit process analysis was completed in the following six sequential tasks:

- Compile and analyze five years (i.e., January 2014 to December 2018) of WWTF data.
- Develop a hydraulic model of the collection system (collection system model) to estimate future peak hour flow (PHF) at the WWTF under the design storm.
- Estimate future flows and loads from 2019 through 2035 to approximate each unit process's necessary treatment performance.
- Develop and calibrate hydraulic and BioWin models to assess how future flows and loads will affect existing plant facilities and their performances.
- Conduct plant tours to complete condition assessments of the existing facilities and identify operational limitations.
- Determine future treatment capacities for existing unit processes and estimate the ideal timing of future plant improvements.

The following sections highlight key points and findings from these six tasks.

7.2.1 Flows and Loads

Tables 7.3 and 7.4 present the current and projected flows and loads, which must be treated and discharged to the Columbia River. These projections were developed according to measured influent flows and wastewater characteristics, typical septage and septic tank effluent pump (STEP) system characteristics, and population growth projections. Chapter 3 details the method by which these flows and loads were analyzed.

Table 7.3 Current and Projected Flows

Flow Parameter	Current Flow (mgd)	2035 Flow (mgd)
ADWF	2.2	3.4
AAF	2.8	4.0
MMF	4.8	6.2
PDF	8.4	10.8
PHF	10.0	13.5

Notes:
Abbreviations: AAF - average annual flow; ADWF - average dry-weather flow; MMF - maximum monthly flow.

Table 7.4 Current and Projected Loads

Load Parameter	Current Load (ppd)	2035 Load (ppd) 50% STEF/STEP
BOD_5		
Average Annual	2,400	6,000
Max Month	3,300	8,200
Max Week	4,300	10,600
Peak Day	5,300	13,000
TSS		
Average Annual	2,500	6,300
Max Month	4,200	10,500
Max Week	7,000	17,000
Peak Day	7,900	19,300
Ammonia		
Average Annual	900	1,400
Max Month	1,100	2,000
Peak Day	1,800	4,300

Notes:
Abbreviations: STEF - Septic tank effluent filter; Hydraulic Modeling.

Carollo Engineers' Hydraulix® modeling software was used to establish the hydraulic capacities of individual unit processes and water surface elevations (WSE) under current and future flows. More specifically, this software modeled the flow through the WWTF by calculating both energy grade lines and hydraulic grade lines according to headloss and velocity at each hydraulic element under various influent flow conditions identified in Table 7.3.

Each individual unit process was considered "at risk" when the model indicated less than 18 inches of freeboard in a structure or less than six inches of fall from flow over a weir to the downstream water surface. A unit process was considered "overloaded," or as having a true hydraulic limitation, when the model indicated less than 12 inches of freeboard or a weir was submerged. Less than 12 inches of freeboard in an open channel puts the WWTF at risk of flow overtopping a structure and must be avoided at all costs.

7.2.2 BioWin Modeling

BioWin version 6.1 was employed to develop an overall process model of the WWTF. This model was calibrated using existing treatment facility operational data and then confirmed by running the calibrated model as a steady-state simulation using average plant influent and effluent values (BOD, TSS, ammonia) from 2018.

Once the calibration effort was deemed acceptable, parameters were established for future conditions under which the WWTF must operate. Specifically, this effort adopted the flows and load projections presented in Tables 7.3 and 7.4 while assuming that effluent limits on ammonia would be as low as seven mg/L for all scenarios.

Finally, the BioWin model was used to model performance of the secondary treatment unit processes under anticipated future conditions, under the following future scenarios:

- A TSS removal rate of 65 percent under current AAF, current MMF, and 2035 AAF conditions and 52 percent under 2035 MMF conditions.
- A minimum aerobic solids retention times (aSRT) of eight days under average conditions and 6.6 days under maximum month conditions.
- The sludge volume index (SVI), which is aquantification of mixed liquor suspended solids (MLSS) settleability, cannot exceed 150 milliliters per gram (mL/g) if capacity limitations are to be prevented.

In regard to the final point, the highest allowable maximum month MLSS concentration, 3,500 milligrams per liter (mg/L), is limited by the capacity for suspended solids to settle in the SCs under peak day flow (PDF). A state point analysis (SPA) was conducted to determine the maximum allowable MLSS concentration, which was 2,330 mg/L with one SC out of service and all three ABs in service. The loading conditions that will result in this maximum month MLSS concentration at a 6.6-day aSRT is a PDF of 9.0 mgd. Section 7.4.2.1 discusses this topic further.

7.2.3 Condition Assessment

A condition assessment was conducted to identify major facility deficiencies and provide a general priority rating for mechanical equipment, treatment units, structures, and electrical, instrumentation, and control (E&IC) systems. The information compiled was used during the planning process to determine which portions of the facility can be retained, which require major upgrades, and which should be abandoned or replaced.

To begin, the assessment team reviewed each unit process's drawings and design criteria, including the Washington State Department of Ecology's (Ecology) recommended WWTF redundancy criteria for flows and loads as published in *Criteria for Sewage Works Design* (2008).

Table 7.5 summarizes the criteria that each facility component must meet.

Table 7.5 Design Criteria for Each WWTF Component

WWTF Component	Flow Criteria	Load Requirement	Redundancy
Influent Screens	• PHF.	-	• 1 unit out of service.
Primary Clarifiers	• PHF + Recirculation.	• Peak hour design load	• All units in service.
Aeration Basins	• Maximum month design flow. • AAF.	• Maximum month design load. • Average annual load.	• All units in service • 1 unit out of service.
Internal Recycle Pumps	• PDF.	-	• 1 unit out of service.
Aeration Systems	-	• Maximum week design load.	• 1 unit out of service.
Secondary Clarifiers	• PDF + Recirculation.	• Maximum month design load.	• all units in service.
RAS Pumps	• 100% of MMF. • 50% of PHF.	-	• 1 unit out of service.
Effluent Filters	• All flows requiring tertiary treatment.	-	-
UV Channel	• PHF.	-	• 1 unit out of service.
Primary Sludge Pumps	• Peak instantaneous design flow.	• Maximum daily design load.	• 1 unit out of service.
Degritting Cyclone	• PHF.	-	• N/A
Grit Classifier	• PHF.	-	• N/A
Gravity Thickener	-	• Maximum daily design load.	• N/A
WAS Pumps	• Peak instantaneous design flow.	• Maximum daily design load.	• 1 unit out of service.
Rotary Drum Thickener	-	• Maximum daily design load.	• 1 unit out of service.

Notes:
Abbreviations: N/A - not applicable; RAS - return activated sludge; UV - ultraviolet; WAS - waste activated sludge.

Next, the team discussed maintenance history, plant shortcomings, and general operational issues with City staff, who also accompanied the team on walk-through inspections of the WWTF's following processes and associated major equipment:

- Preliminary treatment.
- Primary treatment.
- Secondary treatment.
- Aeration blowers.
- Tertiary filtration.
- UV disinfection.
- Effluent pump station and pumps.
- Primary sludge and degritting.

- WAS system.
- Anaerobic digestion and waste gas flare.
- Dewatering centrifuge.
- Biosolids belt dryer.
- Plant drain and non-potable pump station.
- Biofilters and septage-receiving station.
- Facility control systems, including the programmable logic controller (PLC) and central supervisory control and data acquisition (SCADA).

Note that, although they were a part of the assessment, anaerobic digestion and the waste gas flare, dewatered sludge conveyance, and the biosolids belt dryer were not evaluated in detail since they were recently upgraded. Additionally, the biofilters and septage-receiving station were not analyzed in detail and should be more closely reviewed in a subsequent project.

Table 7.6 summarizes each key WWTF component's condition and capacity findings.

Table 7.6 Conditions and Capacity Findings from the WWTF Conditions Assessment

WWTF Component	Condition	Capacity
Influent Screens	• No significant conditions issues identified.	• 14.0 mgd
Primary Clarifiers	• No condition issues identified.	• 2,380 gpd/sq ft PHF
Aeration Basins (AB)	• Weir walls between zones are uneven.	• 8.37 mgd (2 ABs, 2 SCs per SPA) (max month) • 9.12 mgd (3 ABs, 2 SCs per SPA) • 9.71 mgd (3 ABs, 3SCs per SPA)
Secondary Clarifiers (SC)	• SC No. 1 in poor condition.	
Internal Recycle Pumps	• No condition issues identified.	
Aeration Systems	• Unable to control blowers when operating multiple in parallel.	
RAS Pumps	• No condition issues identified.	
Effluent Filters	• No condition issues identified.	• 6.0 mgd
UV Channel	• No condition issues identified.	• 13.7 mgd at 70% UV Transmittance
Primary Sludge Pumps	• No condition issues identified.	• 220 gpm (each)
Degritting Cyclone	• End of useful life.	• 220 gpm (each)
Grit Classifier	• End of useful life.	• 15 gpm
Gravity Thickener	• End of useful life.	• 400 gpm
WAS Pumps	• No condition issues identified.	• 200 gpm

WWTF Component	Condition	Capacity
Rotary Drum Thickener	• Significant Observed Deterioration.	• 200 gpm.
Centrifuge	• Near end of useful life.	
Plant Drain Pump Stations	• Show signs of concrete corrosion and pumps at the end of useful life.	• Plant Drain Pump Station No. 1: 250 gpm at 35 feet TDH • Plant Drain Pump Station No. 2: 500 gpm at 40 feet TDH
Non-Potable Pumps	• No condition issues identified.	• 200 gpm at 185 feet TDH
Effluent Pump Station	• No condition issues identified.	• 12.4 mgd at 18 feet TDH

Notes:
Abbreviations: gpd/sq ft -gallons per day per square foot; gpm - gallons per minute; TDH - total dynamic head.

7.3 Summary of Key Improvements and Preferred Alternatives

Comprehensive analysis of the WWTF's unit processes identified several current and anticipated condition or capacity issues in the WWTF's hydraulic, liquid treatment, solids treatment, and plant support systems. The following sections highlight key issues with unit processes at the WWTF and also recommend improvements to mitigate them; collectively, this information served as the basis for the subsequent alternatives analysis and project development for inclusion in the general sewer plan's recommended CIP.

Each unit process's complete description; condition findings, hydraulic capacity, and process capacity analyses; and recommendations for improvements and alternatives are available in Appendix I: Wastewater Treatment Facility Engineering Reports.

7.3.1 Basis of Project Costs

Cost estimates for treatment projects include 30 percent for construction contingency, 1.3 percent for builder's risk and insurance, 15 percent for general contractor overhead, risk, and profit, and 1 percent for performance and payment bond for a total overall construction adjustment factor of 53 percent. Planning adjustment mark-ups include 25 percent for engineering, legal, and design and 5 percent for owner's reserve for change orders for a total overall planning adjustment factor of 30 percent.

All costs are in 2021 dollars and are benchmarked to an Engineering News Report (ENR) Construction Cost Index 20-city average of 12112 (June 2021). Cost estimates were developed using a Class 4 budget estimate, as established by the American Associate of Cost Estimators (AACE). This level of estimate is used for feasibility studies and assumes a one percent to 15 percent level of project definition. The expected accuracy range is of the Class 4 cost estimates are -30 percent to +50 percent.

7.3.1.1 Total Treatment Project Capital Improvement Cost

The costs presented in this Plan are high-level planning costs to help the City in making financial decisions.

As shown in the following sample calculation of the capital improvement cost, the total cost of all project contingencies (construction and planning) and allied costs (engineering services, construction management, and project administration) is 82 percent of the baseline project cost.

Example:

Baseline Project Cost	**$1,000,000**
Overall Construction Adjustment Factor (53%)	$530,000
Construction Cost	**$1,530,000**
Engineering, Legal, Design (25%)	$382,500
Owner's Reserve (5%)	$76,500
Total Capital Improvement Cost	**$1,989,000**

7.3.2 Hydraulics

To ensure that the plant's unit processes have adequate capacity to handle future flows, hydraulic improvements are recommended in the following areas.

7.3.2.1 Inlet to the Headworks Channel

The headworks's hydraulic capacity is currently limited by the inlet pipe's configuration. Flow from the existing inlet pipe enters a shallow influent channel vertically from below, directing flow *upward* instead of *toward* the flume. As a result, flow upstream of the Parshall flume occasionally sprays out over the top of the headworks structure, especially at high influent flow rates.

To prevent flow measurements from being skewed and raw sewage from splashing over the top of the structure, the inlet pipe to the headworks channel is recommended to be modified by installing a rigid plate or slab over the top of the influent channel to the flume. The new tread plate will replace the existing metal cover with a resilient, watertight alternative.

The estimated total project cost of these modifications is $6,000. They may be implemented at any time either by City staff or a general contractor as part of a larger project. Before implementing the project, the tread plate's load rating must be considered, and the anchorage design must be reviewed to resist the thrust caused by peak flows.

7.3.2.2 Tertiary Filter Bypass System

The plant's two tertiary disc filters are hydraulically bottlenecked by a set of serpentine bypass weirs whose current configuration provides minimal freeboard in the filter influent channel. At sufficiently reduced freeboard, flow may flood the SCs' effluent weirs, splash out of the channel, and potentially damage sensitive equipment and electronics, particularly those of the UV system. If left unmodified, the filters' removal efficiency will decrease as future flows increase and require more bypass, which will also decrease the removal rate of TSS.

To prevent the weirs from limiting the plant's overall hydraulic capacity, the tertiary filter bypass system is recommended to be reconfigured in the following manner:

- Remove the original weir wall between the filter influent channel and the existing serpentine weirs.
- Remove the concrete fill in the corners of the bypass channel to increase the depth and decrease the flow velocity.
- Reverse the serpentine weirs so that flow enters up between and through the launders, allowing for a uniform velocity as flow approaches the bypass weir, which, in turn, leads to more uniform weir loading.

As shown in Table 7.7, the total estimated project cost of the recommended modifications is approximately $49,000. These modifications can be implemented as a standalone project or along with other project efforts to reduce overhead costs. Although the timing of this improvement is not constrained, implementation during the dry weather season is recommended since the work will require temporary bulkheads upstream and downstream of each bypass channel.

Table 7.7 Filter Bypass Modification Costs

Description	Cost(1)
Demolition of Existing Structures	$7,000
New Concrete	$5,000
Structural Steel	$10,000
Bypass Weir Removal and Reinstallation	$3,000
Total Direct Cost	**$25,000**
Total Estimated Construction Cost	**$38,000**
Total Estimated Project Cost	**$49,000**

Notes:
(1) All costs are in 2021 dollars and are benchmarked to an Engineering News Report (ENR) Construction Cost Index 20-city average of 12112 (June 2021).

7.3.3 Liquids Treatment

To address process and condition issues identified in the plant's secondary treatment system, modifications in the following areas are recommended.

7.3.3.1 Secondary Clarifier No. 1

The WWTF's three SCs all have differing effective sidewater depths and configurations, with SC Nos. 2 and 3 performing well. SC No. 1, however, performs poorly and unreliably not only because of the condition of its mechanical equipment but also because it has a center-well sludge-collection mechanism without a sloped floor to its center.

This clarifier is a major existing limitation and, as such, restoring it to its full design capacity is key to also restoring the process and hydraulic capacities associated with the secondary treatment process. As it stands, with all three ABs operating under MMF conditions and using only the two SCs that are currently operable, the secondary system will have insufficient capacity by approximately year 2024.

As such, SC No. 1 is recommended to be replaced with a new 75-foot-diameter, sloped-bottom clarifier similar in design to SC No. 3 since past retro-fit projects have not improved the clarifier's performance. Operating three fully functional SCs will increase the allowable maximum month MLSS concentration from 2,330 mg/L to 2,950 mg/L and slightly increase the allowable PDF from nine mgd to 9.4 mgd.

As shown in Table 7.8, the total estimated project cost to replace SC No. 1 is approximately $5.15 million. To replace SC No. 1, the plant must be operated using only two SCs through at least one wet weather season when peak flow events are likely, placing it at a higher risk of permit violations during construction.

Table 7.8 Replacement Costs for Secondary Clarifier No. 1

Description	Cost(1)
Demolition of Existing Equipment and Structure	$333,000
New Concrete Basin (Similar to SC No. 3)	$1,357,000
75-foot-diameter Spiral Scraper Mechanism	$420,000
Two 30-hp Vertical Centrifugal RAS Pumps	$147,000
Piping Modifications	$158,000
Electrical, Instrumentation, and Controls Upgrades	$175,000
Total Direct Cost	**$2,590,000**
Total Estimated Construction Cost	**$3,958,000**
Total Estimated Project Cost	**$5,146,000**

Notes:
(1) All costs are in 2021 dollars and are benchmarked to an Engineering News Report (ENR) Construction Cost Index 20-city average of 12112 (June 2021).
Abbreviations: hp - horsepower.

7.3.3.2 Secondary Treatment System

The plant's existing secondary treatment system has the following notable issues:

- Aerated volume in existing ABs is insufficient to maintain the eight-day aSRT necessary for stable nitrification.
- The baffle walls that divide the ABs' zones were poorly cut to their current top elevation and/or in deficient condition.
- RAS pumps for SC No. 2 are undersized and cannot prevent a sludge blanket failure under peak flow and load conditions.

The following sections detail each of these issues and their recommended improvements.

Aeration Basins

Flow and load projections predict that approaching 2030, the ABs' current capacity will become insufficient in maintaining an MLSS concentration below 3,500 mg/L under average loading conditions with one basin out of service at the 8-day aSRT required for stable nitrification.

To resolve this issue, the City is recommended to convert the existing ABs' anoxic zone volume into usable aerobic zone volume. If aeration diffusers are added to the final anoxic zone, the overall aerated volume can be increased by approximately 31 percent, leading to an approximate 24 percent decrease in the MLSS concentration allowing the system to maintain an eight-day aSRT. At this rate, the year when the firm AB capacity is exceeded might be prolonged from 2030 to 2038, and the overall SC capacity increases.

Supports for the diffusers in the new aerated zone must be designed to withstand forces exerted by the existing mixer so this zone can operate flexibly as a swing zone that provides either anoxic or aerobic conditions. To this end, the conversion of the current final anoxic zone to an aerated swing zone will require the following modifications:

- **Install a new diffuser grid:** The new diffusers are recommended to be the same type as those currently installed in each of the ABs' oxic zones, which are nine-inch Sanitaire membrane diffusers.
- **Connect the diffuser grid to the existing air pipe header:** Each new zone's aeration piping will include a modulated airflow control valve and a thermal mass flow meter accessible from the walkways between the ABs.

As shown in Table 7.9, the total estimated project cost for these modifications is approximately $340,000.

Table 7.9 Aeration Basin Diffuser Modification Costs

Description	Cost(1)
Three New Sanitaire Diffuser Grids	$69,000
Air Piping Modifications	$60,000
Electrical, Instrumentation, and controls Upgrades	$42,000
Total Direct Cost	**$171,000**
Total Estimated Construction Cost	**$261,000**
Total Estimated Project Cost	**$340,000**

Notes:
(1) All costs are in 2021 dollars and are benchmarked to an Engineering News Report (ENR) Construction Cost Index 20-city average of 12112 (June 2021).

Aeration Basins' Baffle Walls

The marine plywood baffle walls in the ABs' selector zones are in poor condition. In addition, the concrete baffle walls between the ABs' anoxic/oxic zones are uneven and have exposed rebar. These issues not only compromise the structural integrity of the baffle walls but also may cause short-circuiting and backflow between the zones.

To resolve these issues, the marine plywood baffle walls in the selector zones are recommended to be removed, but not replaced. Meanwhile, the concrete baffle walls between the anoxic/oxic zones are recommended to be repaired to cover the exposed rebar and provide an even top of wall elevation. The total estimated project cost for these improvements is approximately $40,000.

Secondary Clarifier No. 2's RAS Pumps

According to the state point analysis introduced in Section 7.2.3, under max month MLSS concentrations and PDF, the current RAS rate is insufficient in preventing the sludge blanket in the SCs from rising. The current rated capacity of the RAS pumps in SC No. 1 is only 1,000 gallons per minute (gpm) and 1,050 gpm in SC No. 2, well below SC No. 3's RAS firm pumping capacity of 1,400 gpm.

Even if SC No. 1 is rehabilitated and additional aerated zones are added to the ABs, PDF will still be limited to 10.6 mgd at a maximum month MLSS concentration of approximately 2,725 mg/L. However, additionally increasing both SC nos. 1 and 2's RAS pumping capacities to 1,400 gpm will increase the allowable maximum month MLSS concentration to 3,000 mg/L at a PDF of 10.9 mgd. This capacity expansion extends the predicted point in time at which the secondary treatment process runs out of capacity to handle PDFs and maximum month MLSS concentrations from 2033 to 2036.

Since SC No. 1 is recommended to be wholly replaced, only SC No. 2's two RAS pumps are recommended to be replaced. The pumps were assumed to be replaced with larger units, although the existing pumps may be sufficient with replacement of impellers.

As detailed in Table 7.10, the total project cost to replace SC No. 2's RAS pumps is approximately $391,000.

Table 7.10 SC No. 2's RAS Pumps Replacement Costs

Description	Cost(1)
Removal of Existing Pump	$3,000
Two 30-hp Vertical Centrifugal RAS Pumps	$147,000
Electrical, Instrumentation, and Controls Upgrades	$47,000
Total Direct Cost	**$197,000**
Total Estimated Construction Cost	**$300,000**
Total Estimated Project Cost	**$391,000**

Notes:
(1) All costs are in 2021 dollars and are benchmarked to an Engineering News Report (ENR) Construction Cost Index 20-city average of 12112 (June 2021).

Timing of the Recommended Improvements for the Secondary Treatment System

The recommended improvements to SC No. 1, the ABs, and the RAS pumps will provide the WWTF with sufficient secondary treatment capacity through 2036, beyond the planning horizon. However, these projects must be implemented with considerations made for permit requirements and process implications.

To replace SC No. 1, the plant must operate with only two units online during a wet weather season when peak flow events will likely increase the risk of violating permit demands when the new SC is being constructed. However, if the aeration improvements are implemented before the new SC is constructed, the secondary treatment process can be operated at a significantly lower MLSS concentration, reducing the risk of settling failure in SC Nos. 2 and 3. Ideally, aeration improvements and SC reconstruction could occur during the same dry weather period when the plant has sufficient capacity to operate with tanks out of service, allowing the aeration improvements to be completed before wet weather flows occur.

The replacement of SC No. 1 is also a sensible time to replace the existing RAS pumps for both SC Nos. 1 and 2. Since SC No. 2 is required while SC No. 1 is under construction, increasing SC No. 2's RAS rate to match that of SC No. 3 will provide an additional buffer against sludge blanket failure while SC No. 1 is out of service.

Section 7.4.2 discusses potential implementation years for these projects. Note that, even with these efforts complete, the City must still begin preparing even more secondary treatment capacity, either by process expansion or intensification, no later than 2031.

7.3.3.3 Aeration Blowers

The WWTF's four multistage centrifugal aeration blowers have the following notable issues:

- The blowers' firm capacity is insufficient to meet projected 2035 air demands.
- The blowers' current operational configuration risks overloading the blower motors and, thus, the four units cannot be run simultaneously.
- Each blower's variable frequency drives (VFD) cannot effectively modulate airflow by changing blower speeds.
- The control valves are oversized and ineffective in controlling dissolved oxygen (DO).
- Adding a fourth aerated zone to each AB will place additional demand on an already undersized system.

To provide capacity, redundancy, and control over a range of current and projected air demands, as well as to meet NPDES permit limits, two of the existing aeration blowers are recommended to be replaced with high-speed turbo blowers, which are more compact, efficient, with VFD speed control, better suited to the task than the existing multistage centrifugal blowers.

Preliminary analyses indicate that two new 300-hp turbo blower units in a duty/standby configuration alongside the two existing 150-hp multistage centrifugal blowers have enough capacity to fulfill 2035 peak air demands. Under these peak conditions, one of the new turbo blowers can be run in parallel with the existing blowers to supply the airflow rate required for aeration, with the second new turbo blower ready on standby. For conditions with low air demand, the plant may continue to use the two existing multistage centrifugal blowers.

As shown in Table 7.11, the total estimated project cost to replace the WWTF's aeration blowers, along with necessary mechanical and electrical improvements, is $1.86 million.

Table 7.11 Aeration Blower Replacement Costs

Description	Cost(1)
Two 300-hp turbo blowers	$691,000
Equipment pads	$3,000
Air piping modifications	$15,000
Electrical, instrumentation, and controls upgrades	$228,000
Total Direct Cost	**$937,000**
Total Estimated Construction Cost	**$1,432,000**
Total Estimated Project Cost	**$1,861,000**

Notes:
(1) All costs are in 2021 dollars and are benchmarked to an Engineering News Report (ENR) Construction Cost Index 20-city average of 12112 (June 2021).

7.3.3.4 UV Disinfection System

The WWTF's existing UV disinfection system is nearing the end of its useful life and, given this age, many of its replacement components are no longer manufactured. As the current system continues to age, repair and replacement parts will become increasingly difficult to procure even as the frequency of component failure likely increases.

To eliminate the risk of losing the plant's UV capacity permanently upon a non-replaceable component failing, the UV system is recommended to be replaced with more modern equipment designed specifically for wastewater and water reuse applications.

The following modifications to the existing UV channel and ancillary equipment are recommended to install a newer model system:

- Complete computational fluid dynamics (CFD) modeling to ensure appropriate and even velocity distribution for flow entering the first new UV bank.
- Replace the existing level control gate with a new unit to provide the deeper water level required by newer UV equipment.
- Demolish and replace the existing ramp up to the level control gate to suit the design requirements of the replacement equipment.
- Replace the four existing banks of UV lamps with three new banks.
- Replace the existing power distribution centers (PDC) with three new PDCs.
- Remove the four step-down transformers currently installed for the existing UV system.
- Cut a small trench in the channel floor for routing hydraulic hoses if required by the new UV system manufacturer.

As shown in Table 7.12, the estimated project cost to replace the existing UV system, including the temporary disinfection process, is approximately $1.15 million. To minimize the volume of bypass pumping and disinfection required, this work is recommended to be performed during an extended low flow period (e.g., dry weather season). A temporary disinfection process, such as a skid-mounted UV disinfection system, will be required while the UV channel is being modified.

Table 7.12 UV Disinfection System Replacement Costs

Description	Cost(1)
New UV Equipment	$340,000
Existing UV Channel Modifications	$65,000
Electrical, Instrumentation, and Controls Upgrades	$65,000
Temporary Disinfection	$110,000
Total Direct Cost	**$580,000**
Total Estimated Construction Cost	**$887,000**
Total Estimated Project Cost	**$1,153,000**

Notes:
(1) All costs are in 2021 dollars and are benchmarked to an Engineering News Report (ENR) Construction Cost Index 20-city average of 12112 (June 2021).

7.3.3.5 Effluent Pump Station

The effluent pump station is a low-head pump station that is only required under elevated river conditions, which occur infrequently. Although the pump station is in good condition, its current firm capacity is insufficient by at least 1 mgd to handle the projected 2035 PHF. The process implications of exceeding the effluent pumps' capacity are catastrophic since flow cannot be removed from the effluent wet well quickly enough to avoid submerging the upstream processes.

To ensure that treated effluent is effectively conveyed out of the plant under 2035 PHF conditions with one pump out of service, the effluent pump station's capacity is recommended to be expanded by replacing the pumps with units capable of providing sufficient flow capacity for condition projected through 2035.

As shown in Table 7.13, the total project cost to replace the existing effluent pumps is estimated to be $1,275,000. The effluent pump station is recommended to be modified during a low river stage when the pumps are unlikely to be needed.

Table 7.13 Effluent Pump Replacement Costs

Description	Cost(1)
Three Centrifugal Pumps, 4,700 gpm at 21 feet TDH	$485,000
Structural and Mechanical Modifications	$11,000
Electrical, Instrumentation, and Controls Upgrades	$146,000
Total Direct Cost	**$642,000**
Total Estimated Construction Cost	**$981,000**
Total Estimated Project Cost	**$1,275,000**

Notes:
(1) All costs are in 2021 dollars and are benchmarked to an Engineering News Report (ENR) Construction Cost Index 20-city average of 12112 (June 2021).

7.3.4 Solids Treatment

To resolve redundancy and condition-related deficiencies identified in the solids processes, modifications to the following areas are recommended.

7.3.4.1 Grit-Separation System

The WWTF's degritting room is filled with odorous air that likely contains significant levels of hydrogen sulfide, which corrodes the degritting equipment in the space; as evidence of this, the cyclones, classifier, gravity thickener, and turbo pumping systems (TPS) pumps all exhibit conditions that indicate a corrosive atmosphere and signify the end of their useful life, requiring extensive rehabilitation or replacement.

In addition to increasing the number of air changes in the degritting room and implementing air treatment using biofilters, the entire grit separation system is recommended to be replaced. As shown in Table 7.14 the total project cost to replace the existing grit separation system is estimated to be $954,000. This project is recommended to be implemented within the next five to 10 years, though replacement may be required sooner if the existing equipment's condition continues to deteriorate.

Table 7.14 Grit-Separation Improvement Costs

Description	Cost[1]
Demolition	$20,000
New Degritting Equipment	$294,000
Piping Modifications	$9,000
Electrical, Instrumentation, and Controls Upgrades	$157,000
Total Direct Cost	**$480,000**
Total Estimated Construction Cost	**$734,000**
Total Estimated Project Cost	**$954,000**

Notes:
(1) All costs are in 2021 dollars and are benchmarked to an Engineering News Report (ENR) Construction Cost Index 20-city average of 12112 (June 2021).

7.3.4.2 Thickened Primary Sludge Pumps

As with the rest of the equipment in the degritting room, the two existing, 130-gpm, progressive cavity TPS pumps have also been corroded by high levels of hydrogen sulfide and are nearing the end of their useful life. Furthermore, these pumps are oversized for the City's sludge flow and concentrations which unnecessarily increases maintenance costs. As such, the existing units are recommended for replacement with new, appropriately sized, 70-gpm progressive cavity units.

As shown in Table 7.15, the projected cost to replace the two existing TPS pumps is $154,000. The priority and timing for this replacement depend on the availability of replacement parts as well as the integrity of the pumps' non-replaceable parts.

Table 7.15 Thickened Primary Sludge Pump Replacement Cost

Description	Cost[1]
Demolition of Existing Pumps	$10,000
Two New 70-gpm Progressing Cavity Pumps	$43,000
Piping Modifications	$6,000
Electrical, Instrumentation, and Controls Upgrades	$19,000
Total Direct Cost	$78,000
Total Estimated Construction Cost	**$119,000**
Total Estimated Project Cost	**$154,000**

Notes:
(1) All costs are in 2021 dollars and are benchmarked to an Engineering News Report (ENR) Construction Cost Index 20-city average of 12112 (June 2021).

7.3.4.3 Sludge Recirculation Pumps

The plant's rotary-lobe-style sludge recirculation pumps have historically had significant issues with microplastics infiltrating the pump shaft seal and damaging the overall unit. Despite replacements and corrections by the manufacturer, the frequency and severity of the maintenance issues have not improved.

Given that the solids content in the WWTF's digester ranges from 1.9 to 5.6 percent, a heavy-duty piston-style pump is recommended to replace the existing pumps. This new unit's shaft seal is located on top of the disk instead of underneath, which eliminates the leaking issue that piston-style pumps often have. And, because the seal has no gaps like a traditional mechanical seal might, infiltration of round microplastics is not anticipated to be an issue. While the seal must be replaced when it wears, the wear parts on this type of pump are anticipated to last three to four times longer than they might on progressive cavity or rotary-lobe pumps.

As shown in Table 7.16, the projected cost to replace the three existing rotary-lobe pumps with three double-disc piston-style pumps is $509,000. This project may be implemented at any time when the budget becomes available, and, to minimize risk, may be piloted to determine its application suitability.

Table 7.16 Sludge Recirculation Pump Replacement Cost

Description	Cost(1)
Demolition	$20,000
Three Double-Disc Piston Pumps: 200 gpm, 54 feet TDH	$144,000
Piping Modifications	$24,000
Electrical, Instrumentation, and Controls Upgrades	$68,000
Total Direct Cost	**$256,000**
Total Estimated Construction Cost	**$391,000**
Total Estimated Project Cost	**$509,000**

Notes:
(1) All costs are in 2021 dollars and are benchmarked to an Engineering News Report (ENR) Construction Cost Index 20-city average of 12112 (June 2021).

7.3.4.4 Rotary Drum Thickener

After 10 years of operation, the plant's rotary drum thickener is showing significant signs of wear. Although the City recently added a new manufacturer-designed stabilization wheel that may allow this existing unit to continue operating, it remains a single point of failure without an operational plan in place to accommodate such a failure.

For full redundancy, a new thickening building capable of housing two RDTs and associated support equipment is required; however, the City's budgetary and site constraints do not currently allow for this construction to take place. Therefore, the City is recommended to continue monitoring and carefully implementing their current protocol for when the RDT is unavailable and proceed with other improvements to the WWTF's unit processes.

The City's current RDT protocol relies on use of the WAS storage tank when the RDT must be taken offline for maintenance. Process modeling of the WWTF indicates that the WAS-wasting rate, which has historically averaged approximately 37,000 gallons per day (gpd), may exceed 100,000 gpd under 2035 MM conditions. This means that, with the RDT offline, the current tank's capacity will be exceeded within one and a half days. Given these projections, planned maintenance activities must be scheduled during demand seasons when the WAS-wasting rate is low, and the RDT operation schedule must be extended during high demand periods to keep the WAS storage tank's levels as low as feasible.

Once the storage tank has reached its maximum capacity, excess WAS is directed to the gravity thickener to be co-thickened with primary sludge. However, this temporary operation affects performance in the following ways:

- Percent capture and thickened sludge concentrations are considerably reduced compared to what would be observed under normal operations.
- Hydraulic loading to the digesters is increased, resulting in a reduction of hydraulic residence time below the recommended 15 days when co-thickening.

While co-thickening's effects may be less severe at lower flows and loads, the temporary operation will not provide reliable thickening relief beyond one to two days at peak flows such as those projected under the 2035 MMF scenario.

With this being said, implementing the recommended improvements to the ABs will allow the secondary treatment process to be operated at a significantly lower MLSS, reducing the risk of settling failure in SC Nos. 2 and 3 and allowing SC No. 1 to be used for additional WAS storage during an emergency. In its current configuration, SC No. 1 can provide nearly 430,000 gallons of storage, which is equivalent to four days of continuous wasting under the 2035 MMF scenario. Note that using this SC for emergency storage will require connections and temporary piping routed from the control building No. 1 for SC Nos. 2's and 3's WAS pump.

7.3.4.5 Dewatering Centrifuge

The plant's existing DS-403 Sharple dewatering centrifuge is over 20 years old and, thus, exhibiting signs of being at the end of its useful life. In 2021 the City purchased a second, refurbished DS-403 Sharple centrifuge to provide dewatering redundancy. In the near term the centrifuge will act as a spare unit should an emergency replacement be required. The City is currently developing plans to modify the dewatering room and install the stand-by centrifuge, which will include the following modifications:

- Install a redundant centrifuge.
- Upsize the centrate piping to reduce any hydraulic restrictions.
- Increase the number of air changes per hour in the room.
- Clean out the existing odor-control piping connected to the centrate chute to confirm that nothing is blocking the ventilation of the centrifuge.

Table 7.17 shows costs for the modifications needed to install the redundant centrifuge in the existing building.

Table 7.17 Dewatering Centrifuge Improvement Costs

Description	Cost(1)
Existing Centrifuge Overhaul	$106,000
Piping and Mechanical Modifications	$39,000
Electrical, Instrumentation, and Controls Upgrades	$168,000
Total Direct Cost	**$313,000**
Total Estimated Construction Cost	**$479,000**
Total Estimated Project Cost	**$622,000**

Notes:
(1) All costs are in 2021 dollars and are benchmarked to an Engineering News Report (ENR) Construction Cost Index 20-city average of 12112 (June 2021).

7.3.4.6 Biosolids Belt Dryer

As mentioned earlier, the biosolids belt dryer was not analyzed or assessed in detail, per the City's direction. However, the condition and capacity of the biosolids dryer are recommended for evaluation within the next five years.

7.3.5 Plant Support Systems

To accommodate future flows and provide reliable operation, modifications are recommended in the following plant support systems.

7.3.5.1 PLC, RIO, and SCADA

The City WWTF's control system includes a mixture of owner PLC systems and vendor PLC systems, which communicate to a central SCADA system that monitors and controls the entire plant. The existing PLC hardware utilizes the Modicon Quantum PLC platform, which includes remote input/output (RIO) racks. Meanwhile, data transfer utilizes older Data Highway Plus (DH+) serial communications.

The existing Modicon Quantum PLCs are outdated and no longer commercially available through the manufacturer. Since the failure of an existing module without a spare in stock could suspend automated control of a portion of the facility, the continued use of this PLC platform poses a significant operational risk.

In addition, the plant's existing Wonderware SCADA application is installed on a single computer server without redundancy, meaning this computer represents a single point of failure. If the computer fails for any reason or Wonderware is corrupted, the WWTF can no longer be governed via the control room. In a worst-case scenario, operators will be required to run all equipment manually from the field until the SCADA system is brought back online.

To minimize risks and employ up-to-date technologies, the WWTF's existing PLC network and SCADA system are recommended to be upgraded.

The following PLCs require replacement:

- Control building 1, PLC E, 1 rack.
- Control building 2, PLC E, 1 rack.
- UV building, PLC D1, 1 rack.
- UV building, UV panel, 1 rack.
- Equipment building, PLC C1, 1 rack.
- Digester building, PLC F, 3 rack.
- Main influent pump station, 1 rack.

Additionally, the following remote input/output cabinets require replacement:

- UV building, PLC D1, 2 RIO.
- Equipment building, PLC C1, 4 RIO.

These units are recommended to be replaced by modern equivalents on a standardized communication protocol, which will allow for a sequenced conversion process. Note that any changes made to the PLC programs by other facility equipment upgrades or changes in operational sequences will increase replacement costs since more PLC programming time will be required.

Meanwhile, the SCADA system must be upgraded and expanded to incorporate a level of redundancy. To develop a modern system with desired features, including advanced data analysis, report generation, and secure remote accessibility, the following upgrades are recommended:

- Replace the existing SCADA server with matching redundant SCADA servers.
- Upgrade the SCADA human-machine interface (HMI) application to a redundant configuration.
- Upgrade or add a SCADA historian application.
- Add a SCADA reporting application.
- Harden the system for improved remote access security by upgrading the network switch with a demilitarized zone (DMZ).
- Rebuild HMI graphics to take advantage of increased system functionality, correct existing errors with data collection and display, and provide robust communications with the upgraded PLC hardware.
- Integrate the existing Hach WIMS data with the SCADA historian and reporting applications.

In addition, the City is recommended to develop a comprehensive and living SCADA master plan that identifies and prioritizes system improvements at the WWTF as well as the City's 27 remote sites, including lift stations, pump stations, and tanks. At this time, controls at these sites are a mix of older hard-wired controls and some PLC control, with hard-wired being the norm; as such, all of the City's remote sites are recommended to be converted to PLC-based controls that utilize a standard format control panel design with radio telemetry communications to the WWTF.

Upgrades to improve the telemetry system are recommended for Lacamas Shores, Sunningdale Gardens, and Winchester Hills 2 in the near term, given that these sites' run-time data all showed risks of capacity deficiencies; the addition of flow meters and pressure sensors is recommended to better understand these stations' capacities or lack thereof. Updates to the other 22 sites are recommended in the long term as the City's budget allows.

Table 7. 18 represents a budgetary cost estimate to implement the proposed upgrades to the City's SCADA, PLC, and RIO systems.

Table 7.18 Camas WWTF Control System Upgrade Cost

Description	Total Estimated Project Cost(1)
SCADA Master Plan	$210,000
SCADA System Upgrade	$644,000
PLC Hardware Upgrade (Nine Cabinets)	$1,295,000
RIO Hardware Upgrade (Six Cabinets)	$650,000

Notes:
(1) All costs are in 2021 dollars and are benchmarked to an Engineering News Report (ENR) Construction Cost Index 20-city average of 12112 (June 2021).

7.3.5.2 Plant Drain Pump Station No. 1

Plant drain pump station No. 1 shows signs of concrete corrosion, and its pumps are nearing the end of their useful life. In addition to these condition-related issues, this station is already required to operate at its total installed hydraulic capacity for extended periods under current conditions and is unlikely to reliably accommodate future recycle flows and loads.

As such, plant drain pump station No. 1 is recommended to be rehabilitated through the following improvements:

- Replace the existing pumps with a new set of submersible pumps, each capable of pumping 500 gpm. The existing motor starter may be reused and connected to the new pumps.
- Install a liner in the existing wet well to extend the life of the existing structure.
- Replace the control panel, pump guide rails, and discharge piping within the wet well.

As shown in Table 7.19, the projected cost to replace plant drain pump station No. 1's pumps and accessories is $517,000.

Table 7.19 Plant Drain Pump Station No. 1 Replacement Cost

Description	Cost(1)
Demolition and Temporary Pumping	$42,000
Wet Well Liner	$95,000
Plant Drain Pumps and Piping	$60,000
Electrical, Instrumentation, and Controls Upgrades	$63,000
Total Direct Cost	**$260,000**
Total Estimated Construction Cost	**$398,000**
Total Estimated Project Cost	**$517,000**

Notes:
(1) All costs are in 2021 dollars and are benchmarked to an Engineering News Report (ENR) Construction Cost Index 20-city average of 12112 (June 2021).

7.3.5.3 Non-Potable Pump No. 3

The non-potable water pump station's three pumps are in reasonably good condition. However, non-potable water pump No. 3 is not currently usable since its intake is located below the UV channel's discharge weir due to air entrainment caused by cascading water and prevents the unit from properly priming, which also causes it to fail.

To mitigate this issue, this pump is recommended to be relocated within the wet well but out of the direct flow path of the weir. While modifications to the pump column are not necessary, a new hole must be cut in the elevated slab over the non-potable pump station's wet well. The total estimated project cost to relocate non-potable water pump No. 3 is approximately $43,000.

Because air entrainment is a persistent issue, any future improvements to the UV system must be made with consideration for the location of these pumps. If a second parallel UV channel must be installed at some point, the entire non-potable water pump station must be modified or most likely relocated to sit within the effluent pump station, and the pumps must be relocated close to the existing UV equipment, which may potentially complicate access to the effluent pump station's electrical room and back-up generator.

7.3.5.4 Odor Control and Treatment

Located in the WWTF's equipment building, the centrifuge room and primary sludge degritting room share a combined odor-control system. Because these rooms lack sufficient airflow, both experience persisting odor issues and corrosion of the assets contained within.

The current centrifuge room exhausts air at a rate of 700 cubic feet per minute (cfm), accounting for approximately 3.5 air changes per hour (ACH). The room also has point-source odor control, which pulls 500 cfm of air from various equipment, accounting for approximately 2.5 ACH. Combined, the room exhausts six ACH.

To improve odor control, the ducting is recommended to be balanced to exhaust 1200 cfm from the overall centrifuge room, 400 cfm from the cake conveyor, and 100 cfm from each centrifuge. This solution will provide the room with 6 ACH, in addition to a more robust point-source connection to prevent odorous air from escaping the centrifuge, for a total of 8.5 ACH. To supply the space with the proper amount of intake air, this alternative requires the installation of a second intake louver on the west wall.

Meanwhile, the primary-sludge-degritting room exhausts 700 cfm of air, accounting for approximately 6.3 ACH. Increasing the exhaust airflow to 1350 cfm is recommended. Furthermore, the three duct drops on the west wall must be balanced to pull 250 cfm each, and the drops above the storage containers must be balanced to pull 300 cfm each. Together, these modifications will provide the space with a total of 12.2 ACH. Similar to that of the centrifuge room, this solution requires a second intake louver to be installed on the east or south wall to supply the proper amount of intake air into the space.

The improvements recommended for both rooms require the shared odor-control fan to exhaust 4850 cfm in total. The current fan only exhausts 3600 cfm. If the fan does not have sufficient capacity to provide the required increase in airflow, a new odor-control fan must be installed in the same location as the existing unit.

Table 7.20 shows the estimated costs associated with the odor-control improvements, including a new fan. Note that this improvement plan's increased airflow will reduce contact time with the biofilter, thus reducing some of the filter's effectiveness and the quality of the air passing through and leaving it. Therefore, the frequency at which media should be replaced will be modestly increased.

Table 7.20 Odor Control Improvement Costs

Description	Cost(1)
Additional Ducting and Louvers	$6,000
New Exhaust Fan Capable Of Exhausting 4,850 cfm	$21,000
Testing and Balancing	$1,000
Total Direct Cost	**$28,000**
Total Estimated Construction Cost	**$42,000**
Total Estimated Project Cost	**$55,000**

Notes:
(1) All costs are in 2021 dollars and are benchmarked to an Engineering News Report (ENR) Construction Cost Index 20-city average of 12112 (June 2021).

7.4 Recommended WWTF Improvement Projects

The improvements recommended to address WWTF capacity limitations over the next 20 years and address current condition issues that prohibit reliability or performance are summarized in this section. The recommended alternatives presented in Section 7.3 were re-organized and, in some cases, grouped together to suggest construction sequencing and project timing the City should consider when implementing these improvements.

The following 14 distinct projects were developed for incorporation into the City's general sewer system plan CIP:

- **TP-1 Aeration Basin Improvements:** This project improves the ABs' performance by making the following modifications:
  - Install new aeration diffusers and associated zone controls in each AB's final anoxic zone to create a new aerated swing zone.
  - Demolish the marine plywood baffle walls at the upstream end of the ABs.
  - Repair and relevel the concrete baffle walls dividing each zone in each AB.
- **TP-2 Secondary Clarifier Improvements:** This project enhances the SCs' performance and capacity by making the following modifications:
  - Demolish SC No. 1 and replace it with a new clarifier that matches SC No. 3's design including RAS pumping capacity.
  - Replace SC No. 2's RAS pumps to provide a firm capacity that matches those of SC No. 3.
- **TP-3 Aeration Blower Replacement:** This project replaces two of the existing aeration blowers with larger high-speed turbo blowers to meet projected aeration demands.
- **TP-4 Disinfection Building and Hydraulic Improvements:** This project enhances plant hydraulics and modifies the disinfection building with the following improvements:
  - Replace the existing UV disinfection equipment and provide a temporary UV skid to bypass the existing channel.
  - Modify the filter bypass so it does not limit the plant's hydraulic capacity.
  - Reconfigure the non-potable water pump station to prevent air entrainment in the pump suction.
  - Redirect the headworks channel inlet pipe to improve flow measurements and prevent splashing of raw sewage out of the top of the structure.
- **TP-5 Effluent Pump Station Improvements:** This project increases the effluent pump station's capacity, as required, to pump 100 percent of 2035's projected PHFs to the outfall in the Columbia River by replacing the existing effluent pumps with larger units.
- **TP-6 Grit-Separation and Odor-Control Improvements:** This project replaces the existing grit-separation equipment, including hydrocyclones and grit classifiers, and increases the capacity of the odor control systems servicing the grit-handling area and dewatering building, which will extend the life and reduce maintenance of new installed equipment.
- **TP-7 Thickened Primary Sludge Pump Replacement:** This replaces the existing TPS pumps with new progressive cavity pumps.
- **TP-8 Sludge Recirculation Pump Replacement:** This project replaces the existing digested sludge pumps with new double-disc piston-style pumps.

- **TP-9 Mechanical Dewatering Improvements:** This project rehabilitates the existing dewatering centrifuge and modifies the space to accommodate a standby unit for redundancy.
- **TP-10 Plant Drain Pump Station Improvements:** This project repairs the existing plant drain pump station No. 1's structure and replaces its pumps.
- **TP-11 SCADA Master Plan:** This project prepares a SCADA master plan that will provide the City with a roadmap to prioritize and implement planned system upgrades designed to address system deficiencies and enhance facility operation. This project includes an in-depth investigation of the existing SCADA control system for the City's WWTF and associated remote sites.
- **TP-12 SCADA Improvements:** This project upgrades the existing SCADA system to provide redundancy and take advantage of modern features, including advanced data analysis, report generation, and secure remote accessibility.
- **TP-13 PLC and RIO Cabinet Improvements:** This project includes replaces existing Modicon Quantum hardware with new, standardized PLCs and RIO cabinets for all process areas at the WWTF.
- **TP-14 Secondary Treatment Expansion Planning Project:** This project plans for a future secondary treatment expansion to accommodate flows and loads outside the planning windows.

7.4.1 Cost Summary of the Improvement Projects

Table 7.21 summarizes the total project cost for each improvement project. Costs are rendered in 2021 dollars and include all construction, engineering, legal, and administrative markups.

Table 7.21 Recommended WWTF Project Costs

Project ID	Improvement Type	Total Project Cost(1)
TP-1 Aeration Basin Improvements	Capacity	$376,000
TP-2 Secondary Clarifier Improvements	Capacity/Condition	$5,539,000
TP-3 Aeration Blower Replacement	Capacity	$1,862,000
TP-4 Disinfection Building and Hydraulic Improvements	Condition/Capacity	$1,252,000
TP-5 Effluent Pump Station Improvements	Capacity	$1,276,000
TP-6 Grit Separation and Odor Control Improvements	Condition	$1,010,000
TP-7 TPS Pump Replacement	Condition	$154,000
TP-8 Sludge Recirculation Pump Replacement	Condition	$509,000
TP-9 Mechanical Dewatering Improvements	Condition	$622,000
TP-10 Plant Drain PS Improvements	Capacity/Condition	$517,000
TP-11 SCADA Master Plan	Planning	$209,000
TP-12 SCADA Improvements	Network	$645,000
TP-13 PLC and RIO Cabinet Improvements	Network	$1,946,000
TP-14 Secondary Treatment Expansion Planning	Planning	$75,000
WWTF Recommended Improvements Total	**–**	**$15,992,000**

Notes:
(1) All costs are in 2021 dollars and are benchmarked to an Engineering News Report (ENR) Construction Cost Index 20-city average of 12112 (June 2021).

7.4.2 Implementation Timing for the Improvement Projects

Implementation timing for the 14 projects was considered in the context of the following factors:

- **Each project's high or low criticality to the WWTF's operation:** Criticality to the process was higher for processes that are essential for liquid treatment and less so for solid treatment processes.
- **The risk of failure associated with the equipment being addressed by a project:** Risk of failure was high or low depending on the age of the equipment, availability of replacement parts from manufacturers, and installed redundancy.

Table 7.22 lists the projects, possible sequencing, start years for design and planning, possible years of implementation for capacity reasons (if applicable), and brief explanations of project prioritization rationale. It is suggested that the City closely track key factors, including growth within service area, useful life, and condition of plant components, to allow for optimal timing and phasing of improvements. Proper timing and phasing of projects will prevent the City from incurring unnecessary construction, operation, and maintenance costs to increase capacity before it is needed to serve users.

Table 7.22 Recommended WWTF Project Implementation Schedule

Project ID	Recommended Start Year	Year Required Online	Reason for Prioritization
TP-1 Aeration Basin Improvements	2026	2030	Improve capacity before TP-2.
TP-2 Secondary Clarifier Improvements	2027	2030	Meet capacity only.
TP-3 Aeration Blower Replacement	2028	2032	Meet capacity only.
TP-4 Disinfection Building and Hydraulic Improvements	2021	2026	Address aging equipment whose parts are unavailable from manufacturers.
TP-5 Effluent Pump Station Improvements	2026	2029	Meet capacity only.
TP-6 Grit Separation and Odor Control Improvements	2023	2027-2032	Eliminate ongoing corrosion in the building and improve workspaces.
TP-7 TPS Pump Replacement	2032	N/A	Anticipated end of useful life.
TP-8 Sludge Recirculation Pump Replacement	2032	N/A	Anticipated end of useful life.
TP-9 Mechanical Dewatering Improvements	2024	N/A	Create redundancy.
TP-10 Plant Drain Pump Station Improvements	2021	2021	Address immediate capacity needs and corrosion issues.
TP-11 SCADA Master Plan	2022	N/A	Update out-of-date software.
TP-12 SCADA Improvements	2023	N/A	Update out-of-date software.
TP-13 PLC and RIO Cabinet Improvements	2023	N/A	Update out-of-date software.
TP-14 Secondary Treatment Expansion Planning	2031	N/A	Secondary treatment inadequate by 2036.

Chapter 8

OPERATION AND MAINTENANCE

8.1 Introduction

This chapter provides an overview of the City of Camas (City) Wastewater Utility organization, staffing, and operation and maintenance (O&M) program. This chapter documents existing practices and identifies changes that may improve system operation and maintenance.

8.2 Organization Structure

The City Public Works Department is organized as shown in Figure 8.1 and is managed by Steve Wall. The Utility group is managed by Rob Charles. There are various groups relevant to this General Sewer Plan (Plan) including the wastewater treatment facility (WWTF), and a combined group with responsibilities pertaining to sewer and water disciplines. The WWTF is supervised by Bob Busch.

Note, Stormwater and Sewer/Water groups assist each other during abnormal conditions, such as cleanup after a major storm or repairs requiring specialized staff and equipment.

The Capital Engineering group managed by James Carothers leads major wastewater capital projects, such as new lift stations. The Utility group leads lift station retrofits, “repair & replacement” projects, and operations and maintenance projects.

8.3 Staffing

8.3.1 Maintenance and Operations Staff

The City combines staff for water and sewer disciplines. Therefore, staff under this branch will work on both water and sewer mains including the septic tank effluent (STE) systems. They are also in charge of making sewer system repairs. Operational staff work full shifts on weekdays and there is always at least one person on duty during the day on weekends. There is always at least one person on call in the evenings to address emergencies.

No additional positions are sought although as of March 2022, there are three vacant water/sewer staff positions the City is seeking to fill.

8.3.2 Wastewater Utility Engineering Staff

WWTF staff work primarily on the treatment plant and are also in charge of the sewer lift stations in the conveyance system. The City’s WWTF National Pollutant Discharge Elimination System (NPDES) permit requires a Washington Wastewater Treatment Facility Operator (WWTFO) Class IV certified operator to be responsible for the plant at all times. Table 8.1 lists WWTF staff certifications. The City has two Class IV operators in the case that one is unavailable. The NPDES permit does not require anyone other than the responsible operator(s) to hold a certification, but the City requires all operators to have a Class I certification or have the ability to acquire one within six months of employment.

Table 8.1 Wastewater Utility Operator Certifications

Name	Position	Certification
Bob Busch	WWTF Supervisor	WWTFO Class IV
William Blake	WWTF Operator Lead	WWTFO Class IV
Ole Helland	WWTF Operator	WWTFO Class II
Ken Murray	WWTF Operator	WWTFO Class I
Steve Carroll	WWTF Operator	WWTFO Class I
Joe Calderone	WWTF Operator	WWTFO Class I
Matt Golphenee	WWTF Operator	WWTFO Class II
Jacob Taylor	WWTF Operator	WWTFO Class II

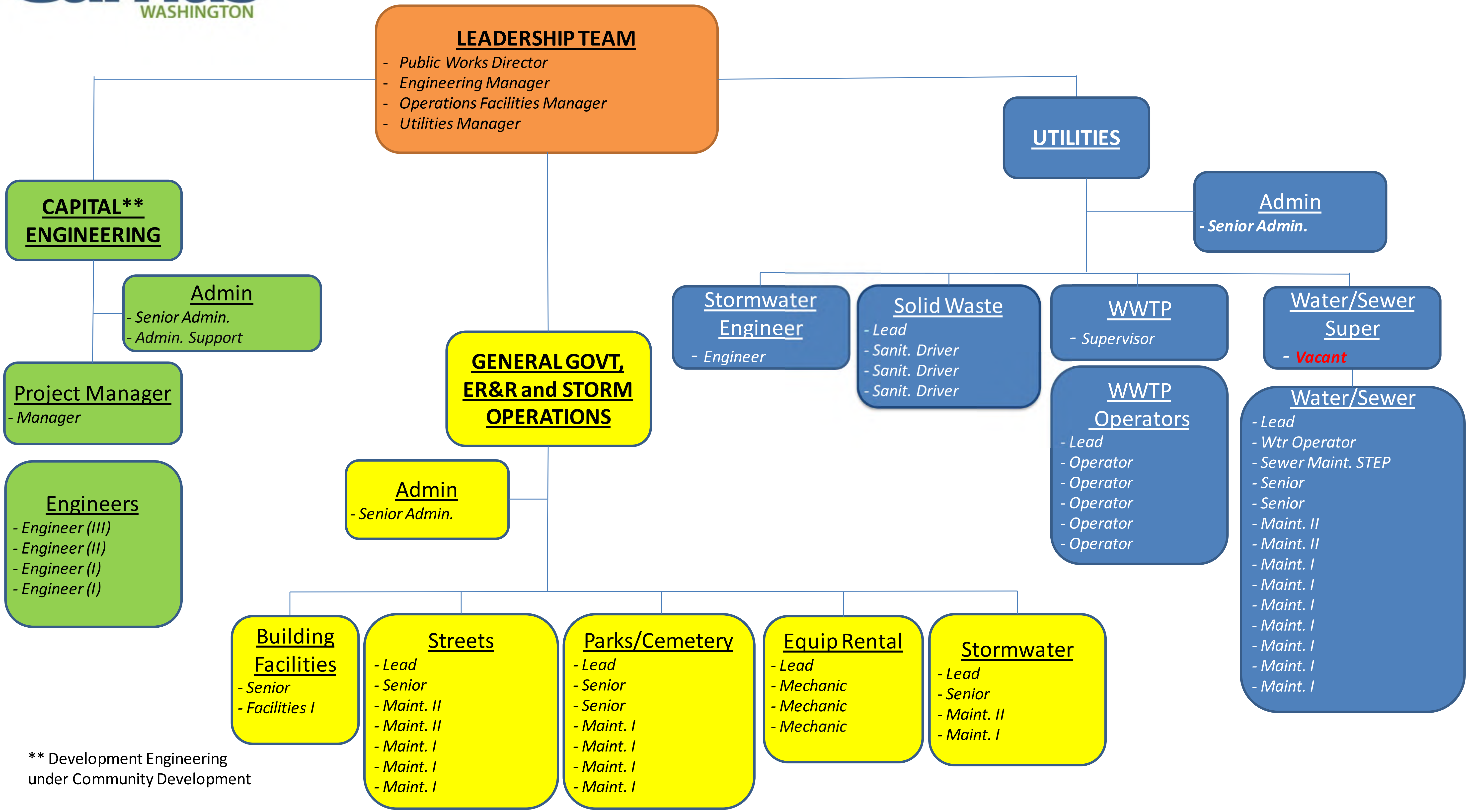
8.4 Records

For O&M record keeping, the WWTF uses a Computerized Maintenance Management System (CMMS), data-tracking Excel spreadsheets, handwritten logbooks, and an electronic repository of equipment documentation. The WWTF staff have a "WWTF" shared drive at the plant, which is a reference library of construction documents, O&M documentation for individual equipment, training materials, etc.

Septic tank effluent pump (STEP) systems are tracked in a separate management system involving record keeping, both on paper and on a tablet. The City currently uses IAUDIT on iPads to document work and plans to move to the same software as the WWTF in the future to better track current activities. The implementation plan is to add new activities to the software as it comes up.

City staff and third-party customer service representatives receive utility-related calls made by system users, and information is dispatched to the appropriate utility staff.

PUBLIC WORKS DEPARTMENT - ORGANIZATIONAL CHART



** Development Engineering under Community Development

8.5 Current Operation and Maintenance Program

8.5.1 Maintenance

8.5.1.1 Lift Station Inspection and Maintenance

Lift station inspection and maintenance is completed by City WWTF Operators listed in Table 8.1.

For all lift stations, pump run hours are closely tracked to identify potential issues. Additionally, periodic maintenance is completed. Table 8.2 presents each activity and frequency staff completes for the sewer lift stations.

Table 8.2 Summary of WWTF Sewer Lift Station Maintenance

Frequency	Component	Activity
Daily	SCADA	• Review lift station alarm history. Check pump/level/pressure/flow trend charts.
	Record Keeping	• Update pump runtime tracking spreadsheets. Review updated sheets for anomalies. Submit requests for any necessary maintenance via CMMS.
Weekly	Controller	• Check for active alarms. Verify pumps, level indicator, and other controller-monitored equipment is operating normally in "AUTO". Document pump run hours. Verify no tripped breakers.
	Pumps	• Run pumps in hand to verify proper operation. Inspect for unusual sounds, vibration, or leaks.
	Genset	• Check ATS status and verify there are no faults and system is ready for emergency operation. Check generator fuel. Check generator for leaks or signs of mechanical failure. Check generator control paned for faults. Generator auto-exercises on Thursdays.
	Dry Well	• Verify dry well is dry. Verify sump pump or floor drain is functioning properly. When running pumps, verify check valves open/close. Verify force main pressure (static and pumping). Check for piping leaks.
	Wet Well	• Inspect influent flow, verifying it is not abnormally high or low, color, odor, etc. Inspect for excess debris or grease accumulation. If able, break up FOG and pump out. Verify level sensors are free of debris or obstructions, clean, as necessary.
	Odor Control System	• Verify proper operation and odor level. Inspect for unusual sounds, vibration, odor, and leaks.
	Surge Tank	• Verify proper operation, checking controller for any faults.
	Grounds	• Monitor physical appearance of station. Remove any accumulated trash or debris. Monitor and control vegetation. Monitor for odors emanating from station.
Quarterly	Pumps	• Perform draw down testing for each pump.
	Record Keeping	• Update pump tracking spreadsheet with draw down test results.
	Odor Control System	• Change out carbon media at Lacamas Meadows Lift Station. In depth check of biofilter systems.
Bi-Annually	Gas Sensors	• Calibrate lower explosive limit meters.
	Grounds	• Herbicide application, where necessary.
	Odor Control System	• Change out odor control media on carbon absorber units.
	Isolation Valves	• Exercise isolation valves at all lift stations to maintain operability.
Annually	Generator	• Third-party preventative maintenance.
	Pumps	• Pull pumps for visual inspection.
	Main Pump Station Pumps	• Third-party preventative maintenance.
	Piping	• Winterize any water piping.
	Odor Control System	• Winterize biofilters prior to freezing weather. Turn off odor control units that are not operated during winter months. Turn on odor control units that are operated during summer months.
	Wet Well	• Cleaning of any wet wells that have accumulated excessive FOG/floatables/debris.
Every 3 Years	Pumps	• Third-party pump inspections and testing.

Notes:
Abbreviations: ATS - automatic transfer switch; FOG - fats, oils, and grease; SCADA - Supervisory Control and Data Acquisition.

8.5.1.2 Pipeline Video Inspection

A closed-circuit television (CCTV) inspection of the gravity main by push camera was completed in 2013. For future inspections, the City will contract with CCTV inspection contractors on an as needed basis for their CCTV and manhole inspection programs. Inspections will be performed in accordance with all industry standards and best practices.

8.5.1.3 Manhole Inspection and Maintenance

The City inspects manholes on an as-needed basis and the manhole inspection program will be contracted out to a third party as well. The City may choose to implement their own standards for manhole inspections, rather than rely on the NASSCO standards.

8.5.1.4 Root Cutting

Root maintenance is completed as needed. It is anticipated that additional root cutting tasks may be identified through contracted video inspection on an as needed basis.

8.5.1.5 Grease Removal

The City educates customers on FOG as part of their general education program. It is anticipated that through video inspection, the City may identify pipes with heavy FOG. Initially, it is recommended the preventative maintenance activities involving FOG include outreach to local business or industries and or more frequent cleaning, especially if an area is persistently found to be impacted by FOG. If FOG is more widespread than currently thought, then the City may consider a FOG program.

8.5.1.6 Hydraulic Line Cleaning

Flushing is done every month for flat areas in the system. Where normal flushing is insufficient to address known problem areas, pipe jetting is completed either as preventative maintenance or on an as needed basis. The City would like to implement a comprehensive jetting program that may be completed by the City or will be contracted out to a third party.

8.5.1.7 Repair Sewers

Point repairs are conducted to address pipe deficiencies identified through CCTV inspection and are undertaken as required and as resources allow. Work may be completed by City staff or through a small works type contract.

8.5.1.8 STEP Maintenance

The City owns and maintains the STEP system. Currently, the City conducts solids pumping from about 600 STEP tanks annually through contractors. Additional it maintains the step tanks, pumps, and telemetry concurrently. The City has an active STEP tank education program with customers.

It is recommended to conduct a STEP tank condition assessment to identify repair and replacement needs including inspection of the STEP tank and connections to the STEP tank as well as an inspection of the proper function of the STEP tank. From this condition assessment, a STEP repair and replacement program should be developed and included in the City's Capital Improvement Program (CIP). Current STEP tank replacement costs are about $11,000 per STEP tank to be installed by a contractor.

8.5.2 Operations

The City operations group are generally divided into treatment, pump stations, and pipes.

The City operators at the WWTF conduct various activities, including: monitoring and adjusting treatment parameters, conducting water quality measurements and other related lab tests, and managing the City's Class A, Exceptional Quality Biosolids program.

The WWTF operators are also responsible to monitor the pump stations throughout the collection system. The treatment facility operators monitor the sanitary pump stations while the water/sewer staff monitor the septic tank effluent systems throughout the City.

City staff are responsible for pipe activities associated with operating the collection system, including repairing pipelines.

City staff also lead operations during emergencies or natural disasters. Emergency operations include preparing and planning for emergencies and conducting drills.

Individual staff duties and operations include administration tasks, training, and tool maintenance. Staff have their own administrative duties to complete weekly as well as meetings to attend in addition to their normal operator duties. They are also in charge of maintaining and cleaning their tools and equipment. The City values the importance of training staff; thus, staff will also allocate time annually to training and conferences as a means to further develop their skills.

8.6 Future Operation and Maintenance Needs

The WWTF plans to expand their internal maintenance capabilities while reducing dependency on third-party maintenance contracting. The WWTF is working to develop deeper pump, clarifier and instrumentation inspection and maintenance skills. The WWTF plans to constantly expand and improve their usage of the CMMS and its work ordering and tracking capabilities. Furthermore, the WWTF has an ongoing effort to develop an extensive set of Standard Operating Procedures for common operations, maintenance, safety, and administrative tasks.

As stated above, the City will contract with CCTV inspection contractors to complete video inspection in the collection system. It is recommended to develop a hydraulic line cleaning program while completing the video inspection. The hydraulic line cleaning program can be completed by the City or third-party contractors. With this inspection and cleaning program, it is expected that other repair needs will be identified for roots, FOG, and point repairs.

Currently the City's staffing focus is to fill the current vacant water/sewer supervisor and staff positions. In the future, to aid in the development of non-capital utility projects the City wants to add a staff civil engineer and an electrician to the utility team.

Chapter 9

CAPITAL IMPROVEMENT PLAN

9.1 Introduction

This chapter summarizes the Capital Improvement Plan (CIP) for the City of Camas (City) General Sewer Plan (Plan). The CIP includes projects needed to accommodate growth, repair and replace aged infrastructure, and attain level of service goals. The CIP is arranged in terms of short-term (2022-2031) and long term (2032-2041) periods. Projects are grouped into pipeline, pump station, septic tank effluent pump (STEP), inflow and infiltration (I/I), maintenance, treatment plant, and general types of infrastructure work. The CIP consists of the cost estimates and schedules for the recommended improvements.

The following sections present cost estimating assumptions, recommended projects, estimated costs for each project, and a summary of the CIP.

9.2 Cost Estimating Assumptions

Cost estimates were developed for each of the recommended projects in the CIP for budgeting purposes. The CIP costs are planning level estimates only and should be refined during pre-design of the projects as final costs of a project with depend on actual labor and materials costs, competitive market conditions, final project scope, implementation schedule, and other variable factors. The CIP cost estimate should be periodically reevaluated to account for changes in inflation.

All costs are in 2021 dollars and are benchmarked to an Engineering News Report (ENR) Construction Cost Index 20-city average of 12112 (June 2021). Cost estimates were developed using a Class 4 budget estimate, as established by the American Association of Cost Estimators (AACE). This level of estimate is used for feasibility studies and assumes a one percent to 15 percent level of project definition. The expected accuracy range is of the Class 4 cost estimates are -30 percent to +50 percent.

9.2.1 Conveyance Cost Assumption

This section provides the CIP for pipelines, lift stations, and STEPs. Cost estimates for conveyance infrastructure represent total project cost including materials, construction, engineering, legal, and administrative costs. Costs were represented as unit costs, as described in subsequent sections. Costs are based on costs provided by the City or similar projects completed by Carollo Engineers. The following are the total marks-ups to direct costs: 30 percent for construction management contingency, 30 percent for engineering, legal, and design costs, and 10 percent for administration contingency.

9.2.1.1 Total Conveyance Project Capital Improvement Cost

The costs presented in this Plan are high-level planning costs to help the City in making financial decisions.

As shown in the following sample calculation of the conveyance projects capital improvement cost, the total cost of all project contingencies (construction and planning) and allied costs (engineering services, construction management, and project administration) is 82 percent of the baseline project cost.

Example:

Baseline Project Cost	**$1,000,000**
Construction Management Contingency (30%)	$300,000
Construction Cost	**$1,300,000**
Engineering, Legal, Design (30%)	$390,000
Administration (10%)	$130,000
Total Capital Improvement Cost	**$1,820,000**

9.2.1.2 Pipeline Unit Costs

For pipes, baseline project costs are calculated by multiplying the estimated new pipe length by a proposed unit cost. All of the known pipelines involved in this CIP are between eight-inches and 27-inches. Pipeline unit costs are available in Table 9.1; broken down by pipeline diameter and depth of installation. These unit costs were used to estimate the total cost of replacement. The unit costs assume open-trench construction in improved areas. Costs include pavement cutting, excavation, hauling, shoring, pipe materials and installation, backfill material and installation, and pavement replacement.

Table 9.1 Pipeline Construction Unit Costs

Pipeline Diameter (inches)	Cost per LF (10+ feet deep)	Cost per LF (5 feet deep)
8	$330	$223
10	$341	$233
12	$351	$243
15	$372	$266
18	$383	$277
21	$388	$282
24	$397	$287
27	$404	$298

Notes:
Abbreviations: LF - linear feet.

9.2.1.3 Pump Station Unit Costs

Pump station unit costs were based on costs to similar projects Carollo Engineers has completed in the past. There are unit costs for pump station upgrades and telemetry. Pump station upgrades include repair and replacement to the station itself and force main cleaning. Pump station telemetry includes upgrading or updating the SCADA system at the pump stations.

9.2.1.4 STEP Unit Costs

Since there was no data for the STEP systems, STEP CIP projects are targeted to assess the conditions of the STEP system to determine future maintenance and repair and replacement projects. STEP main conditioning assessment and cleaning, and STEP system lift stations SCADA were based on similar projects Carollo Engineers have completed for other cities in the past.

9.2.2 Treatment Cost Assumptions

Cost estimates for treatment projects include 30 percent for construction contingency, 1.3 percent for builder's risk and insurance, 15 percent for general contractor overhead, risk, and profit, and one percent for performance and payment bond for a total overall construction adjustment factor of 53 percent. Planning adjustment mark-ups include 25 percent for engineering, legal, and design and 5 percent for owner's reserve for change orders for a total overall planning adjustment factor of 30 percent.

9.2.2.1 Total Treatment Project Capital Improvement Cost

The costs presented in this Plan are high-level planning costs to help the City in making financial decisions.

As shown in the following sample calculation of the capital improvement cost, the total cost of all project contingencies (construction and planning) and allied costs (engineering services, construction management, and project administration) is 82 percent of the baseline project cost.

Example:

Baseline Project Cost	**$1,000,000**
Overall Construction Adjustment Factor (53%)	$530,000
Construction Cost	**$1,530,000**
Engineering, Legal, Design (25%)	$382,500
Owner's Reserve (5%)	$76,500
Total Capital Improvement Cost	**$1,989,000**

9.3 Capital improvement Plan

As discussed, the CIPs are prioritized based on their urgency and risk to mitigate deficient systems. The timing for implementing these improvement projects is based on the affordability and urgency of the project. It is recommended that the City monitor growth and adjust project implementation accordingly.

9.3.1 Planning Periods

The following terms are used to define timing and prioritization into three planning periods:

- **Short-term (2022 - 2031).** Proposed facilities determined to be a high priority.
- **Long-term (2032 - 2041).** Proposed facilities determined to be a low priority or proposed facilities to service major growth areas to be developed in the long-term.

9.3.2 Project Types

Projects are categorized by type. These types include the following:

- "G" = Growth.
- "R&R" = Repair and Replacement.
- "LOS" = Level of Service.

Growth projects are focused on updating infrastructure to address the needs of expanding. Repair and replacement projects are focused on renewing or replacing infrastructure in poor condition. Level of Service projects are focused on upgrading infrastructure to address level of service concerns. The types aid the City in determining the appropriate funding sources.

9.3.3 Project and Program Naming

An individual Project Sheet was generated for each CIP project and includes project identifiers, description, costs, project type, and comments to aid in future implementation. Project are separated into the following categories:

- "P" = Pipeline.
- "PS" = Pump Station.
- "G" = General.
- "S" = STEP.
- "I&I" = Inflow and infiltration.
- "M" = Maintenance.
- "TP" = Treatment plant.

A summary of all CIP projects by facility type and project type is shown in Table 9.2. A summary of costs by project category and type is presented at the end of the chapter.

Table 9.2 Capital Improvement Plan Summary

City of Camas
General Sewer Plan
Capital Improvement Plan

Capital Improvement Plan Summary

Project		CIP Project Subtotal[1]	Total CIP Cost Estimate	CIP Phasing 2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Short-term (2022-2031)	Long-term (2032-2041)	Project Type: Growth	Repair & Replacement	Level of Service
Gravity Pipeline																		
P-01	NW Fargo St Upsize	$ 354,000	$ 644,000	$ -	$ 644,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 644,000	$ -	0%	0%	100%
P-02	Division St Upsize	$ 717,000	$ 1,306,000	$ -	$ 1,306,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,306,000	$ -	0%	0%	100%
P-03	NW 6th Pl West Upsize	$ 282,000	$ 514,000	$ -	$ 514,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 514,000	$ -	0%	0%	100%
P-04	NW 6th Pl East Upsize	$ 207,000	$ 376,000	$ -	$ 376,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 376,000	$ -	0%	0%	100%
P-05	NW 6th Ave West Upsize	$ 454,000	$ 825,000	$ -	$ 825,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 825,000	$ -	0%	0%	100%
P-06	NW 6th Ave East Upsize	$ 339,000	$ 617,000	$ -	$ 617,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 617,000	$ -	0%	0%	100%
P-07	Adams St Upsize	$ 678,000	$ 1,235,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 554,000	$ 681,000	$ -	$ 1,235,000	$ -	50%	0%	50%
P-08	NW 18th Loop Upsize	$ 214,000	$ 389,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 389,000	50%	0%	50%
P-09	NE 15th Ave Upsize	$ 98,000	$ 179,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 179,000	50%	0%	50%
	Gravity Subtotal		**$ 6,085,000**	**$ -**	**$ 4,282,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 554,000**	**$ 681,000**	**$ -**	**$ 5,517,000**	**$ 568,000**			
Pump Station																		
PS-01	South Prune Hills Pump Station Improvements	$ 280,000	$ 510,000	$ -	$ 510,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 510,000	$ -	0%	0%	100%
PS-02	West Camas Pump Station Improvements	$ 280,000	$ 510,000	$ -	$ -	$ -	$ -	$ 510,000	$ -	$ -	$ -	$ -	$ -	$ 510,000	$ -	50%	0%	50%
PS-03	Crown View Hill Pump Station Improvements	$ 280,000	$ 510,000	$ -	$ -	$ 510,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 510,000	$ -	0%	0%	100%
PS-04	Main Pump Station Improvements	$ 280,000	$ 510,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 510,000	$ -	$ 510,000	$ -	50%	0%	50%
PS-05	Upgrade Pump Station Telemetry	$ 320,000	$ 14,560,000	$ -	$ -	$ -	$ 1,747,000	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,747,000	$ 12,813,000	50%	0%	50%
	Pump Station Subtotal		**$ 16,600,000**	**$ -**	**$ 510,000**	**$ 510,000**	**$ 1,747,000**	**$ 510,000**	**$ -**	**$ -**	**$ -**	**$ 510,000**	**$ -**	**$ 3,787,000**	**$ 12,813,000**			
General																		
G-01	Gravity Collection System Model	$ 270,000	$ 491,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 491,000	75%	0%	25%
	General Subtotal		**$ 491,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 491,000**			
STEP																		
S-01	STEP Main Flows	$ 126,000	$ 229,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 229,000	75%	0%	25%
S-02	STEP Main Modeling	$ 53,000	$ 96,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 96,000	75%	0%	25%
S-03	STEP Main Condition Assessment/ Cleaning	$ 451,000	$ 821,000	$ -	$ -	$ 821,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 821,000	$ -	0%	0%	100%
	STEP System Subtotal		**$ 1,146,000**	**$ -**	**$ -**	**$ 821,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 821,000**	**$ 325,000**			
Inflow and Infiltration																		
I&I-01	Ongoing I&I Program	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	50%	0%	50%
	Inflow and Infiltration Subtotal		**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**			
Maintenance																		
M-01	WWTP R&R	$ 2,000,000	$ 2,000,000	$ 2,000,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,000,000	$ -	0%	100%	0%
M-02	Pump Station R&R	$ 12,000,000	$ 12,000,000	$ 600,000	$ 600,000	$ 600,000	$ 600,000	$ 600,000	$ 600,000	$ 600,000	$ 600,000	$ 600,000	$ 600,000	$ 6,000,000	$ 6,000,000	0%	100%	0%
M-03	Sewer Main R&R	$ 3,000,000	$ 3,000,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 1,500,000	$ 1,500,000	0%	100%	0%
M-04	STEP Tank R&R	$ 2,800,000	$ 5,095,000	$ -	$ 1,019,000	$ 1,019,000	$ 1,019,000	$ 1,019,000	$ 1,019,000	$ -	$ -	$ -	$ -	$ 5,095,000	$ -	0%	100%	0%
	Maintenance Subtotal		**$ 22,095,000**	**$ 2,750,000**	**$ 1,769,000**	**$ 1,769,000**	**$ 1,769,000**	**$ 1,769,000**	**$ 1,769,000**	**$ 750,000**	**$ 750,000**	**$ 750,000**	**$ 750,000**	**$ 14,595,000**	**$ 7,500,000**			
Treatment Plant																		
TP-01	Aeration Basin Improvements	$ 189,223	$ 376,000	$ -	$ -	$ -	$ -	$ -	$ -	$ 376,000	$ -	$ -	$ -	$ 376,000	$ -	80%	20%	0%
TP-02	Secondary Clarifier Improvements	$ 2,785,535	$ 5,539,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 5,539,000	$ -	$ -	$ 5,539,000	$ -	50%	50%	0%
TP-03	Aeration Blower Replacement	$ 936,557	$ 1,862,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,862,000	$ -	$ 1,862,000	$ -	100%	0%	0%
TP-04	Disinfection Building / Hydraulic Improvements	$ 629,472	$ 1,252,000	$ -	$ 1,252,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,252,000	$ -	20%	80%	0%
TP-05	Effluent Pump Station Improvements	$ 641,550	$ 1,276,000	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,276,000	$ -	$ -	$ -	$ 1,276,000	$ -	100%	0%	0%
TP-06	Grit Separation / Odor Control Improvements	$ 507,998	$ 1,010,000	$ -	$ -	$ -	$ 1,010,000	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,010,000	$ -	0%	100%	0%
TP-07	TPS Pump Replacement	$ 77,520	$ 154,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 154,000	0%	100%	0%
TP-08	Sludge Recirculation Pump Replacement	$ 256,077	$ 509,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 509,000	0%	100%	0%
TP-09	Mechanical Dewatering Improvements	$ 828,992	$ 1,648,000	$ -	$ -	$ -	$ -	$ 1,648,000	$ -	$ -	$ -	$ -	$ -	$ 1,648,000	$ -	0%	100%	0%
TP-10	Plant Drain Pump Station No. 1 Improvements	$ 260,057	$ 517,000	$ -	$ 517,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 517,000	$ -	50%	50%	0%
TP-11	SCADA Master Plan	$ 208,964	$ 209,000	$ -	$ -	$ 209,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 209,000	$ -	50%	50%	0%
TP-12	SCADA Improvements	$ 324,439	$ 645,000	$ -	$ -	$ -	$ 645,000	$ -	$ -	$ -	$ -	$ -	$ -	$ 645,000	$ -	50%	50%	0%
TP-13	PLC & RIO Improvements	$ 978,424	$ 1,946,000	$ -	$ -	$ -	$ 1,946,000	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,946,000	$ -	50%	50%	0%
TP-14	Secondary Treatment Expansion Planning	$ 75,000	$ 75,000			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 75,000	100%	0%	0%
	Treatment Plant Subtotal		**$ 17,018,000**	**$ -**	**$ 1,769,000**	**$ 209,000**	**$ 3,601,000**	**$ 1,648,000**	**$ -**	**$ 1,652,000**	**$ 5,539,000**	**$ 1,862,000**	**$ -**	**$ 16,280,000**	**$ 738,000**			
CIP Total			$ 63,435,000	$ 2,750,000	$ 8,330,000	$ 3,309,000	$ 7,117,000	$ 3,927,000	$ 1,769,000	$ 2,402,000	$ 6,843,000	$ 3,803,000	$ 750,000	$ 41,000,000	$ 22,435,000	$ 17,495,700	$ 30,920,800	$ 15,018,500
Annual Cost			$ 3,172,000	$ 2,750,000	$ 8,330,000	$ 3,309,000	$ 7,117,000	$ 3,927,000	$ 1,769,000	$ 2,402,000	$ 6,843,000	$ 3,803,000	$ 750,000	$ 4,100,000	$ 2,244,000	$ 875,000	$ 1,546,000	$ 751,000

Notes:
1. CIP Project Subtotal is project cost before contingency costs are added. CIP Project Cost = Estimated Construction Cost. Total CIP Project Cost = Estimated Construction Cost plus merkups for contingency, construction overhead (as applicable), engineering, and administration.
2. Part of existing City CIP Project.

9.4 Pump Station Projects

Pump stations in the CIP are all recommended to be upgraded to provide pump redundancy under existing conditions. These stations do not meet the required firm capacity. It is recommended that the City improve these pump stations redundancy and add a third redundant pump with the same capacity as the current pumps.

9.4.1 PS-01: South Prune Hills Pump Station

The South Prune Hills Pump Station captures flows from the Southwest portion of the system. Based on the modeled flows to the pump station wet well, and City draw down testing, the pump station receives more peak wet weather flow (PWWF) than its firm capacity during existing and buildout conditions. The stations firm capacity needs to convey more than double its current firm capacity from 449 gallons per minute (gpm) to 1,113 gpm. Extensive upgrades to the station are recommended in the short-term. The estimated cost is $510,000 in 2023.

9.4.2 PS-02: West Camas Pump Station Improvements

The West Camas Pump Station captures flows from the Southwest portion of the system and is just downstream of the south Prune Hills PS. Based on the modeled flows to the pump station wet well, and City draw down testing, the pump station receives more PWWF than its firm capacity during existing and buildout conditions. The stations firm capacity needs to convey more than double its current firm capacity from 579 gpm to 1,302 gpm. Extensive upgrades to the station are recommended in the short-term, but later than project PS-01, which currently restricts flow to the West Camas Pump Station. The estimated cost is $510,000 and is planned for 2026.

9.4.3 PS-03: Crown View Hill Pump Station

The Crown View Hill Pump Station captures flows from the Northern portion of the system. Based on the modeled flows to the pump station wet well, and City draw down testing, the pump station receives more PWWF than its firm capacity during existing and buildout conditions. The stations firm capacity needs to convey more than triple its current firm capacity from 148 gpm to 530 gpm. Extensive upgrades to the station are recommended in the short-term. The estimated cost is $510,000 and is planned for 2024.

9.4.4 PS-04: Main Pump Station Improvements

The Main Pump Station captures flows from the majority of the system, except Flow Monitoring Basin 8-1-1. This station is just upstream on the WWTP. Based on the modeled flows to the pump station wet well, and City draw down testing, the pump station receives more PWWF than its firm capacity during existing and buildout conditions. The stations firm capacity needs to convey more than its current firm capacity from 3,851 gpm to 5,682 gpm. Extensive upgrades to the station are recommended in the long-term, after upstream stations have been upgraded. The estimated cost is $510,000 and is planned for 2030.

9.4.5 PS-05: Upgrade Pump Station Telemetry

The telemetry and control system is how flow rates are measures and maintenance needs are updated. Supervisory control and data acquisition (SCADA) systems collect data from City lift stations, which can then be accessed by Civil Engineers and control sub consultant to help the City maintain the system. Upgrades to improve the telemetry system are recommended for

Lacamas Shores, Suningdale Gardens, and Winchester Hills 2 in the near term. These sites run time data all showed a risk of capacity deficiencies. The addition of flow meters and pressure sensors is recommended to better understand these stations capacity or lack thereof. Updates to the other 22 stations are recommended in the long-term. The near-term section of the project is planned for 2025 and the estimated cost is $1,747,000. The remainder of the project has an estimated cost of $12,813,000 and is planned for the long term.

9.5 STEP Projects

Since data was not available to evaluate the STEP system, improvement projects were not developed. However, CIP STEP projects include monitoring, modeling, and condition assessments to evaluate the STEP system in the future.

9.5.1 S-01: STEP Main Flows

Issues with treatment plant inflow monitoring restricted the ability to separate out STEP flows from Gravity System Flows. Recently, this issue was resolved, and future monitoring will allow a greater understanding of the STEP Main flows. If Oak and Main PSs are flow metered, the STEP system flow can be determined. A future study is recommended once sufficient historical data is available. The estimated cost is $229,000 and is planned for the long term.

9.5.2 S-02: STEP Main Modeling

The STEP system should be added to the collection system model in order to evaluate that portion of the system. Additional metering at pump stations further upstream would allow calibration of the STEP portion of the model. The addition of a manhole with a flow meter near Northwest (NW) Lake Rd and NW Lacamas Drive or NW Parker Street and NW Knapp Lane to aid in calibration should also be considered. Figure 6.24 shows the potential overview of a STEP main model and proposed monitoring locations to add to the STEP system, shown as green circles. Inflows are shown in red and black triangles. These are based on the Gray and Osborne 2010 General Sewer Plan Appendix F. These inflows give an overview of where additional monitoring could be available in order to divide up the system during STEP model calibration. The estimated cost is $96,000 and is planned for the long term.

9.5.3 S-03: STEP Main Condition Assessment and Cleaning

The addition of manholes to the STEP system would help investigation of the STEP mains condition and allow any partially obstructed portion of the STEP Main to be identified. A future investigation of debris, solids, and other obstruction is recommended in the sags in the system. The estimated cost is $821,000 and is planned for 2024.

9.6 Pipeline Projects

CIP pipeline projects were determined from the results of a skeletonized model evaluation. Most pipeline projects address level of service concerns and some are combined growth and level of service projects.

9.6.1 P-01: NW Fargo Street Upsize

Model surcharging and manhole flooding at manholes 3-1-26 and 3-1-25 revealed the need for upsizing. To alleviate surcharging 1,007 LF of pipe between manholes 3-1-26 to 3-1-22 should be upsized from 8- to 12-inch pipe, along NW Fargo Street between NW 23rd and NW 19th Avenue. This project is at a depth of approximately 10 feet. This estimated cost is $644,000 and is planned for 2023.

9.6.2 P-02: Division Street Upsize

Model surcharging and manhole flooding at manholes 3-1-11, 3-1-10, and 3-1-6 revealed the need for upsizing. To alleviate surcharging 2,043 LF of pipe between manholes 3-1-11 to 3-1-2 should be upsized from 8 to 12-inch pipe. This project is a gravity pipeline along Division Street between NW 18th and 11th Avenue, at an approximate depth of 10 feet. The estimated cost is $1,306,000 and is planned for 2023.

9.6.3 P-03: NW 6th Place West Upsize

Model surcharging and manhole flooding at manholes 10-1-8 revealed the need for upsizing. To alleviate surcharging 188 LF of pipe between manholes 10-1-11 to 10-1-10 should be upsized from 8 to 12-inch pipe and 616 LF of pipe between manholes 10-1-8 to 10-1-5 from 10 to 12-inch pipe. This project is a gravity pipeline along NW 6th Place, just upstream of the South Prune Hills Pump Station, at an approximate depth of 10-15 feet. The estimated cost is $514,000 and is planned for 2023.

9.6.4 P-04: NW 6th Place East Upsize

Model surcharging and manhole flooding at manholes 10-1-3 revealed the need for upsizing. To alleviate surcharging 188 LF of pipe between manhole 10-1-3 to the West Camas Pump Station wet well should be upsized from 10 to 12-inch pipe. This project is a gravity pipeline along NW 6th Place between South Prune Hills PS and West Camas PS, at an approximate depth of 5-10 feet. The estimated cost is $376,000 and is planned for 2023.

9.6.5 P-05: NW 6th Avenue West Upsize

Model surcharging and manhole flooding at manholes 1-1-9, 1-1-8, and 1-1-7 revealed the need for upsizing. To alleviate surcharging 311 LF of pipe between manholes 1-1-9 to 1-1-7 should be upsized from 12- to 15-inch pipe, and 1,340 LF of pipe between manholes 1-1-7 to 1-1-2 should be upsized from 12-inch to 18-inch. This project is a gravity pipeline along NW 6th Avenue, downstream of the West Camas PS and through Forest Home Park, at an approximate depth of five feet. The estimated cost is $825,000 and is planned for 2023.

9.6.6 P-06: NW 6th Avenue East Upsize

Model surcharging occurs between manholes 2-1-3 to 5-1-12, along NW 6th Avenue. To alleviate surcharging 817 LF of pipe between manholes 2-1-3 to 2-1-1 should be upsized from 12 to 18-inch pipe, and 401 LF of pipe between manholes 2-1-1 to 5-1-12 should be upsized from 12-inch to 21-inch. This project is a gravity pipeline along NW 6th Avenue, between NW 7th Avenue and Southeast (SE) Adams Street, at an approximate depth of five feet. The estimated cost is $617,000 and is planned for 2023.

9.6.7 P-07: Adams Street Upsize

Model surcharging occurs along SE 3rd Avenue, and flooding emerges at manholes 5-1-5 and 5-1-6 during buildout conditions. To alleviate surcharging 773 LF of pipe between manholes 5-1-10 to 5-1-12 and manholes 5-1-6 to 5-1-8 should be upsized from 21 to 24-inch pipe, and 925 LF of pipe between manholes 5-1-10 to 5-1-8 and manholes 5-1-6 to 5-1-2 should be upsized from 24-inch to 27-inch. This project is a gravity pipeline along Northeast (NE) and SE Adams Street between SE 3rd Avenue and NW 6th Avenue, at an approximate depth of 5-10 feet. The total estimated cost is $1,235,000 and is planned for $554,00 in 2027 and $681,000 in 2030.

9.6.8 P-08: NW 18th Loop Upsize

Model surcharging occurs along NW 18th Loop, during buildout conditions. To alleviate surcharging 609 LF of pipe between manholes 3-1-1 to 3-1-16 and manholes 3-1-13 to 3-1-13 should be upsized from 8 to 12-inch pipe. This project is a gravity pipeline along NW 18th Loop, at an approximate depth of 5-10 feet. The estimated cost is $389,000 and is planned for the long-term.

9.6.9 P-09: NE 15th Avenue Upsize

Model surcharging occurs along NE 15th Avenue, during buildout conditions. To alleviate surcharging 256 LF of pipe between manholes 4-1-2 to 4-2-1 should be upsized from 8 to 18-inch pipe. This project is a gravity pipeline along NE 15th Avenue between NE Garfield Street and NE Franklin Street, at an approximate depth of 10 feet. The estimated cost is $179,000 and is planned for the long-term.

9.7 Inflow and Infiltration Projects

9.7.1 I&I-01: Ongoing I&I Program

The City has an on-going I&I program which should continue and focus on high I&I areas from the modeling efforts. Further discussion is provided in Chapter 5.

9.8 Maintenance Projects

9.8.1 M-01: WWTP Repair and Replacement

Ongoing R&R is an item in the City's 2020 Sewer Capital Budget. No construction, E/L/D, or admin are applied, as the $2,000,000 cost is from the City's budget.

9.8.2 M-02: Pump Station Repair and Replacement

Ongoing R&R is an item in the City's 2020 Sewer Capital Budget. No construction, E/L/D, or admin are applied, as the $600,000 cost is from the City's budget. The cost is multiplied by a quantity of 20 for an estimated total cost of $12,000,000.

9.8.3 M-03: Sewer Main Repair and Replacement

Ongoing R&R is an item in the City's 2020 Sewer Capital Budget. No construction, E/L/D, or admin are applied, as the $150,000 cost is from the City's budget. The cost is multiplied by a quantity of 20 for an estimated total cost of $3,000,000.

9.8.4 M-04: STEP Tank Repair and Replacement

A STEP Tank R&R program is recommended to maintain the STEP collection system and prevent aging infrastructure and increases to infiltration in the system. This program will be a three-step process of assessment, repairs, and replacement. This should be performed for all tanks in the STEP system over the next 5 years. The estimated cost is $5,100,000 and is planned from 2023 to 2028.

9.9 Treatment Plant Projects

Treatment plant projects in the CIP occur at the Wastewater Treatment Plant (WWTP). The projects aim to mitigate capacity limitations over the next 20 years and address current condition issues that prohibit reliability or performance. Projects were grouped together to consider construction sequencing and project timing.

9.9.1 TP-01: Aeration Basin Improvements

This project includes general modifications to the aeration basin to improve performance, including the following:

- Demolition of the existing marine plywood baffle walls at the upstream end of the aeration basin.
- Installation of new aeration diffusers and associated zone controls in the final anoxic zone to create a new aerated swing zone.
- Repair and releveling of the concrete walls dividing each zone in each aeration basin.

The estimated cost is $376,000 and is planned for 2028.

9.9.2 TP-02: Secondary Clarifier Improvements

This project involves the replacement of two of the existing aeration blowers with larger high-speed turbo blowers to meet projected future aeration demands. The estimated cost is $5,539,000 and is planned for 2029.

9.9.3 TP-03: Aeration Blower Replacement

This project includes the demolition of the existing Secondary Clarifier No. 1 and replacement with a new clarifier matching the design of the existing Secondary Clarifier No. 3, as well as replacement of the existing Secondary Clarifier No. 2 RAS pumps to provide firm capacity matching that of Secondary Clarifier No. 3. The estimated cost is $1,862,000 and is planned for 2030.

9.9.4 TP-04: Disinfection Building / Hydraulic Improvements

This project includes modifications to the Disinfection Building and general hydraulic improvements, including the following:

- Replacing the existing UV disinfection equipment and providing temporary UV skid to bypass existing channel.
- Modifying the filter bypass so it does not limit the plant hydraulic capacity.
- Reconfiguring the NPW Pump Station to prevent air entrainment in pump suction.
- Redirecting the headworks channel inlet pipe to improve flow measurement and prevent splashing of raw sewage out of the top of the structure.

The estimated cost is $1,252,000 and is planned for 2023.

9.9.5 TP-05: Effluent Pump Station Improvements

This project involves increasing the capacity of the existing effluent pump station as required to pump 100 percent of projected 2035 peak hour flows to the outfall in the Columbia River. It assumes that this is accomplished by replacement of the existing effluent pumps with larger pumps. The estimated cost is $1,276,000 and is planned for 2028.

9.9.6 TP-06: Grit Separation / Odor Control Improvements

This project involves replacement of existing grit separation equipment, including hydrocyclones and grit classifiers, as well as increasing the capacity of the odor control systems servicing the grit handling area and the dewatering building. The estimated cost is $1,010,000 and is planned for 2025.

9.9.7 TP-07: TPS Pump Replacement

This project involves replacement of the existing thickened primary sludge pumps with new progressive cavity pumps. The estimated cost is $154,000 and is planned for the long-term.

9.9.8 TP-08: Sludge Recirculation Pump Replacement

This project involves replacement of the existing digested sludge pumps with new double disc piston-style pumps. The estimated cost is $509,000 and is planned for the long-term.

9.9.9 TP-09: Mechanical Dewatering Improvements

This project involves rehabilitation of the existing dewatering centrifuge and the addition of a second dewatering centrifuge for redundancy. The estimated cost is $1,648,000 and is planned for 2026.

9.9.10 TP-10: Plant Drain Pump Station No. 1 Improvements

This project involves repair of the existing Plant Drain Pump Station No. 1 structure and replacement of the existing pumps. The estimated cost is $517,000 and is planned for 2023.

9.9.11 TP-11: SCADA Master Plan

The SCADA master plan will provide the City with a road map to planned system upgrades designed to address system deficiencies and enhance facility operation. Development of the master plan will include an in-depth investigation of the existing SCADA control system for the City's wastewater treatment facility (WWTF) and the associated remote sites. The estimated cost is $209,000 and is planned for 2024.

9.9.12 TP-12: SCADA Improvements

Upgrades to the existing SCADA system to provide redundancy and take advantage of modern features including advanced data analysis, report generation, and secure remote accessibility. The estimated cost is $654,000 and is planned for 2025.

9.9.13 TP-13: PLC and RIO Improvements

This project includes replacement of the existing Modicon Quantum hardware with the Modicon M580 PLC and X80 I/O. The estimated cost is $1,946,000 and is planned for 2025.

9.9.14 TP-14: Secondary Treatment Expansion Planning

This project plans for a future secondary treatment expansion to accommodate flows and loads outside the planning windows. The estimated cost is $75,000 and is planned for the long-term.

9.10 General Projects

9.10.1 G-01: Gravity Collection System Model

The gravity collection system model is heavily skeletonized, only 24 percent of the gravity system pipes are included. A full pipe or less skeletonized model is needed for a more robust evaluation of the system. In order to expand the model, accurate and updated GIS for the collection system should be developed. The estimated cost is $491,000 and is planned for the long-term.

9.11 Summary of CIP

Recommended improvements include five pump station projects, three STEP projects, nine pipeline projects, one inflow and infiltration project, four maintenance projects, 14 treatment plant projects, and one general project. Most projects are allocated as repair and replacement projects at $30.9 M. Level of service projects are at $17.5 M and growth projects are at $15.0 M. The total CIP is $63.4 M.

The CIP recommends budgeting $41.0 M in the short term. The average annual short-term cost for all recommended projects is approximately $4.1 M per year from 2022 through 2031. The CIP recommends $22.4 M in the long-term with an average annual long-term cost of approximately $2.2 M per year from 2032 through 2041.

Detailed sheets for each CIP project presented in this chapter can be found in Appendix K of the Plan. Table 9.3 summarizes the total cost and annual cost for each planning period.

Table 9.3 CIP Planning Period Summary

Planning Period	Total Cost	Annual Cost
Short-term (2022-2031)	$41.0 M	$4.1 M
Long-term (2032-2041)	$22.4 M	$2.2 M

Maintenance projects accounts for 35 percent of the CIP projects at $22.1 M, followed by treatment plant projects at $17.0 M (27 percent) and pump station projects at $16.6 M (26 percent). Table 9.4 summarizes the total estimated capital costs by facility type. Figure 9.1 shows the various project types of CIP allocation.

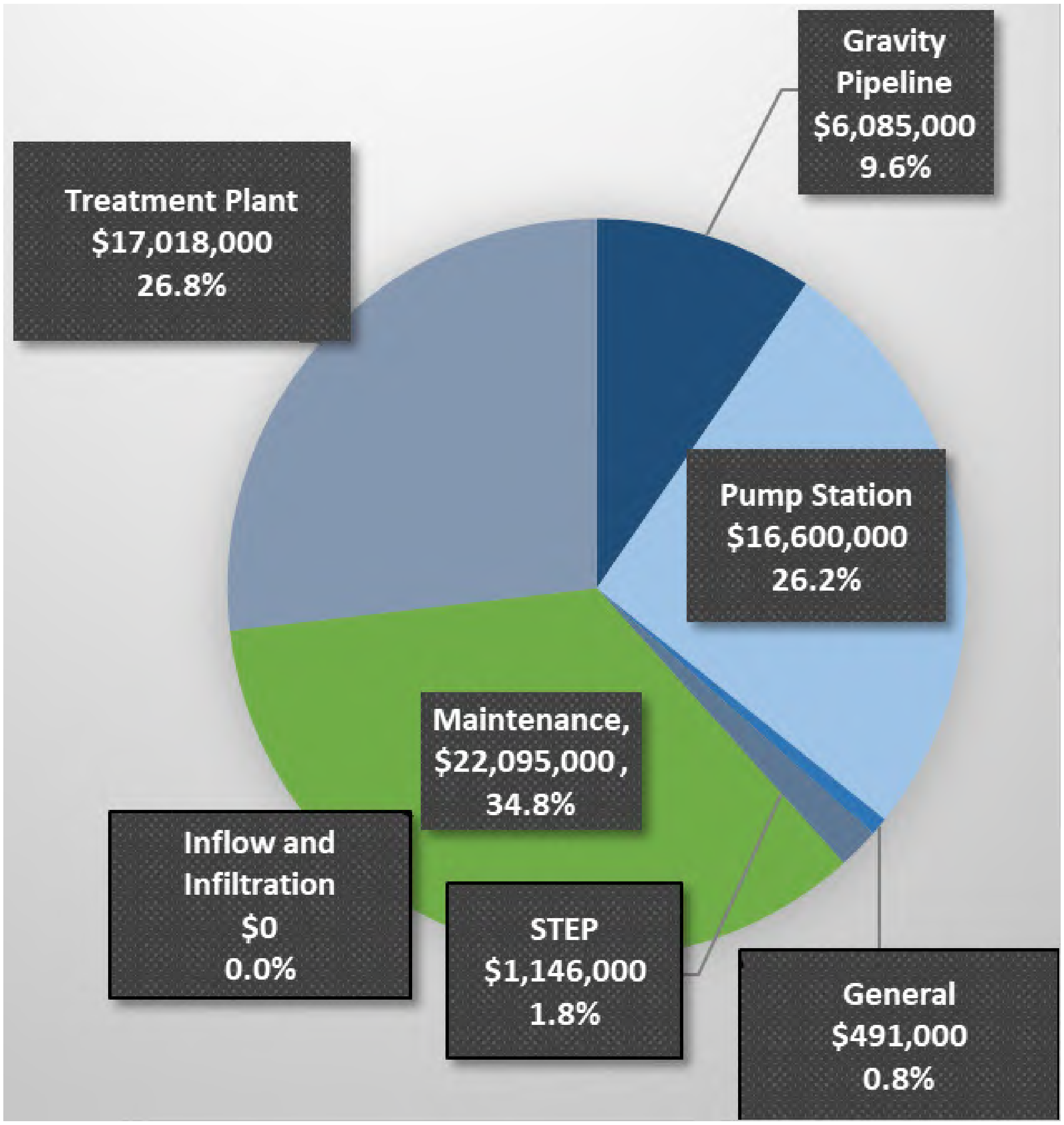


Figure 9.1 Cost by Project Type

Table 9.4 CIP Summary by Project Type

Project ID	Title	Total Capital Cost	Planning Period	
			Short-term (2022-2031)	Long-term (2032-2041)
Pump Station				
PS-01	South Prune Hills Pump Station Improvements	$510,000	$510,000	
PS-02	West Camas Pump Station Improvements	$520,000	$510,000	
PS-03	Crown View Hill Pump Station Improvements	$520,000	$510,000	
PS-04	Main Pump Station Improvements	$520,000	$510,000	
PS-05	Upgrade Pump Station Telemetry	$14,560,000	$1,747,000	$12,813,000
STEP				
S-01	STEP Main Flows	$229,000		$229,000
S-02	STEP Main Modeling	$96,000		$96,000
S-03	STEP Main Condition Assessment/ Cleaning	$821,000	$821,000	
Pipeline				
P-01	NW Fargo Street Upsize	$664,000	$664,000	
P-02	Division Street Upsize	$1,306,000	$1,306,000	
P-03	NW 6th Place West Upsize	$514,000	$514,000	
P-04	NW 6th Place East Upsize	$376,000	$376,000	
P-05	NW 6th Avenue West Upsize	$825,000	$825,000	
P-06	NW 6th Avenue East Upsize	$617,000	$617,000	
P-07	Adams Street Upsize	$1,235,000	$1,235,000	
P-08	NW 18th Loop Upsize	$389,000		$389,000
P-09	NE 15th Avenue Upsize	$179,000		$179,000
Inflow and Infiltration				
I&I-01	Ongoing I&I Program	--		

Project ID	Title	Total Capital Cost	Planning Period	
			Short-term (2022-2031)	Long-term (2032-2041)
Maintenance				
M-01	WWTP Repair and Replacement	$2,000,000	$2,000,000	
M-02	Pump Station Repair and Replacement	$12,000,000	$6,000,000	$6,000,000
M-03	Sewer Main Repair and Replacement	$3,000,000	$1,500,000	$1,500,000
M-04	STEP Tank Repair and Replacement	$5,095,000	$5,095,000	
Treatment Plant				
TP-01	Aeration Basin Improvements	$376,000	$376,000	
TP-02	Secondary Clarifier Improvements	$5,539,000	$5,539,000	
TP-03	Aeration Blower Replacement	$1,862,000	$1,862,000	
TP-04	Disinfection Building / Hydraulic Improvements	$1,252,000	$1,252,000	
TP-05	Effluent Pump Station Improvements	$1,276,000	$1,276,000	
TP-06	Grit Separation / Odor Control Improvements	$1,010,000	$1,010,000	
TP-07	TPS Pump Replacement	$154,000		$154,000
TP-08	Sludge Recirculation Pump Replacement	$509,000		$509,000
TP-09	Mechanical Dewatering Improvements	$1,648,000	$1,648,000	
TP-10	Plant Drain Pump Station No. 1 Improvements	$517,000	$517,000	
TP-11	SCADA Master Plan	$209,000	$209,000	
TP-12	SCADA Improvements	$645,000	$645,000	
TP-13	PLC and RIO Improvements	$1,946,000	$1,946,000	
TP-14	Secondary Treatment Expansion Planning	$75,000		$75,000
General				
G-01	Gravity Collection System Model	$491,000		$491,000

Chapter 10

FINANCIAL PLAN

10.1 Introduction

This chapter was prepared by FCS GROUP to provide a financial program that allows the City of Camas (City) sewer utility to remain financially viable during the planning period. This financial viability analysis considers the historical financial condition, current and identified future financial and policy obligations, operation and maintenance (O&M) needs, and the financial impacts of the capital projects identified in this General Sewer Plan (Plan). Furthermore, this chapter provides a review of the sewer utility's current rate structure with respect to rate adequacy and customer affordability.

10.2 Past Financial Performance

This section includes a historical summary of financial performance as reported by the City, including fund resources and uses arising from cash transactions, as well as a historical summary of comparative statements of net position, which are useful indicators of the City's financial position.

10.2.1 Comparative Financial Statements

The City legally owns and operates both a water and sewer utility. Operations and financial reporting occur on a combined utility fund basis. Table 10.1 shows a summary of the utility fund resources and uses arising from cash transactions for the previous 6 years (2015 through 2020) for the water and sewer utilities combined. Table 10.2 shows a summary of assets and liabilities, with the difference between the two reported as "net position." Increases or decreases in net position are useful indicators of the financial position of the City's utility fund. Noteworthy findings and trends are discussed following each table to demonstrate the historical performance and condition of the City's combined utility fund.

Table 10.1 Summary of Historical Fund Resources and Uses Arising from Cash Transactions

	2015	2016	2017	2018	2019	2020
Operating Revenues						
Charges for Service	$11,202,674	$11,411,593	$12,034,637	$12,436,638	$12,625,383	$13,595,484
Total Operating Revenues	$11,202,674	$11,411,593	$12,034,637	$12,436,638	$12,625,383	$13,595,484
Operating Expenses						
Water Operations and Maintenance	$1,885,556	$2,453,392	$2,102,232	$1,820,073	$3,175,678	$2,918,824
Sewer Operations and Maintenance	2,300,528	2,730,173	2,160,594	2,328,923	2,366,102	2,362,571
Customer Accounts	39,123	77,005	81,347	103,290	82,415	113,647
Administration	1,277,740	1,181,535	1,744,099	1,692,329	1,667,443	1,643,828
Taxes	389,507	435,240	470,531	517,704	589,618	535,323
Depreciation and Amortization	3,071,893	3,183,705	3,521,386	3,758,016	4,474,904	4,661,734
Total Operating Expenses	$8,964,347	$10,061,050	$10,080,189	$10,220,335	$12,356,160	$12,235,927
Operating Income (Loss)	$2,238,327	$1,350,543	$1,954,448	$2,216,303	$269,223	$1,359,557
Nonoperating Revenues (Expenses)						
Interest Earnings	$26,983	$204,446	$249,358	$403,216	$1,000,866	$547,253
State and Federal Grants	-	-	-	-	-	67,417
Interest and Fiscal Charges	(842,275)	(1,136,153)	(1,132,064)	(1,081,102)	(1,723,672)	(1,578,632)
Gain (Loss) on Disposal of Assets	(30,508)	3,821	(126,326)	298	-	(109,215)
Miscellaneous Revenue (Expense)	161,635	641,503	204,474	511,028	292,041	13,650
Debt Issuance Cost	-	-	-	-	(147,928)	-
Total Non-Operating Revenues (Expenses)	$(684,165)	$(286,383)	$(804,558)	$(166,560)	$(578,693)	$(1,059,527)
Income (Loss) before Contributions and Transfers	$1,554,162	$1,064,160	$1,149,890	$2,049,743	$(309,470)	$300,030
Capital Contributions	2,601,733	5,881,163	7,175,669	12,838,554	17,022,644	12,594,638
Transfers In	-	-	191,461	117,744	86,217	132,782
Transfers Out	-	-	(139,172)	-	-	-
Increase (Decrease) in Net Position	$4,155,895	$6,945,323	$8,377,848	$15,006,041	$16,799,391	$13,027,450
Total Net Position Beginning of Year	$68,680,879	$71,814,867	$78,614,731	$86,899,537	$101,905,578	$119,750,648
Change in Accounting Principles	(1,021,907)	-	(154,994)	-	-	-
Prior Period Adjustment	-	(145,459)	61,952	-	1,045,679	(223,860)
Total Net Position, End of Year	$71,814,867	$78,614,731	$86,899,537	$101,905,578	$119,750,648	$132,554,238
O&M Coverage Ratio	125.0%	113.4%	119.4%	121.7%	102.2%	111.1%
Net Operating Income as a % of Operating Revenue	20.0%	11.8%	16.2%	17.8%	2.1%	10.0%
Debt Service Coverage Ratio	5.93	10.45	3.58	3.89	3.09	3.94

Table 10.2 Summary of Historical Comparative Statements of Net Position

	2015	2016	2017	2018	2019	2020
Current Assets						
Cash, Cash Equivalents, Pooled Investments	$4,619,622	$6,652,747	$7,300,446	$16,034,437	$19,009,248	$12,109,932
Receivables						
Accounts	1,603,637	1,705,130	2,467,888	1,683,994	1,700,675	1,987,362
Developer Agreement	-	-	-	-	166,096	332,192
Restricted Assets						
Cash and Cash Equivalents	6,743,812	6,433,517	10,348,092	5,218,201	5,120,589	19,444,546
Investments	15,024,018	15,119,563	6,475,060	1,496,284	11,143,904	2,092,214
Interest Receivable	8,858	600	-	-	821	-
Total Current Assets	$27,999,947	$29,911,557	$26,591,486	$24,432,916	$37,141,333	$35,966,246
Long Term Assets						
Developer Agreement	$-	$-	$-	$-	$1,670,408	$1,504,312
Non-Depreciable Assets						
Land and Improvements to Land	1,108,023	1,015,178	942,835	942,835	1,073,895	1,930,433
Land Rights	-	92,845	477,394	537,394	1,619,493	3,024,486
Construction In Progress	10,074,376	4,155,957	12,576,133	2,893,525	2,600,268	4,949,841
Deferred Charges	-	-	-	-	-	-
Property, Plant and Equipment (Net)						
Building	20,913,401	21,438,584	20,914,486	24,929,225	23,949,529	23,022,438
Intangible Assets	388,526	385,721	-	55,674	310,067	255,323
Improvements Other than Buildings	5,177,60	9,918,134	9,546,801	10,483,732	10,605,403	18,545,390
Machinery and Equipment	18,567,85	18,986,219	17,816,343	16,851,938	16,236,367	16,785,492
Infrastructure	39,776,49	45,498,995	49,354,925	68,820,466	79,901,446	81,112,850
Total Noncurrent Assets	$96,006,27	$101,491,633	$111,628,917	$125,514,789	$137,966,876	$151,130,565
Total Assets	$124,006,225	$131,403,190	$138,220,403	$149,947,705	$175,108,209	$187,096,811
Total Deferred Outflows of Resources						
Deferred Amount on Refunding	246,166	223,615	201,065	127,163	171,584	$31,247
Amounts Related to Pensions	150,855	280,188	181,133		35,152	233,890
Total Deferred Outflows of Resources	397,021	503,803	382,198	127,163	206,736	$265,137
Liabilities						
Current Liabilities						
Accounts Payable	$1,161,415	$633,737	$1,412,772	$1,115,924	$445,392	$241,793
Customer Deposits	-	-	-	-	-	2,714
Accrued Interest Payable	227,132	293,713	275,429	146,455	360,199	344,933
Accrued Employee Benefits	12,916	15,476	11,162	12,417	14,053	17,002
Line of Credit	-	2,647,259	40,664	-	-	1,050,000
Unearned Revenues	35,000	-	-	-	-	2,892
Total OPEB liability - Short Term	-	-	-	-	-	13,182
Bonds, Notes and Loans Payable	2,752,641	3,012,332	3,260,036	3,367,485	3,121,308	2,642,168
Payable from Restricted Assets	78,375	407	890,039	495,674	35,330	101,849
Total Current Liabilities	$4,267,479	$6,602,924	$5,890,102	$5,137,955	$3,976,282	$4,416,533
Annual Revenue Bond Debt Service	*$896,195*	*$433,960*	*$1,531,475*	*$1,534,175*	*$1,534,775*	*$1,530,075*
Non-Current Liabilities						
Bonds, Notes and Loans Payable	$45,838,121	$44,347,386	$43,590,207	$41,307,897	$49,591,611	$48,401,818
Unearned Revenue - Developer Credit	1,083,944	604,647	453,149	310,525	694,296	689,310
Net Pension Liability	1,031,588	1,500,278	1,195,273	712,058	552,735	647,872
Accrued Employee Benefits	208,142	200,800	352,597	111,755	126,478	153,020
Total OPEB Liability	-	-	-	273,813	243,715	231,418
Total Non-Current Liabilities	$48,161,795	$46,653,111	$45,591,226	$42,716,048	$51,208,835	$50,123,438
Total Liabilities	$52,429,274	$53,256,035	$51,481,328	$47,854,003	$55,185,117	$54,539,971
Deferred Inflows of Resources						
Amounts Related to Pensions	$159,105	$36,227	$221,736	$315,287	$351,113	$212,790
Inflows - Amounts Related to OPEB	$-	$-	$-	$-	$28,067	$24,949
Total Deferred Inflows of Resources	$159,105	$36,227	$221,736	$315,287	$379,180	$237,739
Net Position						
Net Investment in Capital Assets	$64,569,715	$67,960,072	$73,863,415	$85,894,304	$98,157,464	$106,694,344
Restricted for Debt Service	1,548,179	1,567,095	1,603,591	1,622,623	1,698,047	1,716,329
Restricted for Capital Purposes	2,208,041	5,776,990	5,100,355	6,650,823	12,208,294	11,582,557
Unrestricted	3,488,932	3,310,574	6,332,176	7,737,828	7,686,843	12,561,008
Total Net Position	71,814,867	78,614,731	86,899,537	101,905,578	119,750,648	132,554,238
Current Ratio	1.5	1.3	1.7	3.4	5.3	3.3
Debt to Net Position Ratio	0.7	0.6	0.5	0.4	0.4	0.4
Debt to Noncurrent Capital Assets Ratio	0.5	0.5	0.4	0.4	0.4	0.3

Notes:
Abbreviations: OPEB - other post-employment benefits.

10.2.2 Findings and Trends

- The City's combined water and sewer charges for services increased from $11.2 million (M) in 2015 to $13.6M in 2020. The average annual compounding increase is 4.0 percent per year, with a total increase of 21.4 percent from 2015 to 2020. Expenses range from $9.0M in 2015 to $12.2M in 2020, showing increases every year. With an average annual compounding increase of 6.4 percent, expenses have grown faster than revenues over the past 6 years and have increased 36.5 percent overall. While combined water and sewer maintenance and operations expenses have increased 26.2 percent, the largest contributor to increases in expenses is depreciation and amortization, growing by 51.8 percent since 2015.
- The O&M coverage ratio (total operating revenues divided by total operating expenses) started at 125.0 percent in 2015 and has trended downward reaching a low of 102.2 percent in 2019 before recovering to 111.1 percent in 2020. A ratio of 100.0 percent or greater shows that revenue will successfully cover expenses, and the City has remained above this ratio for the past six-year period.
- Net operating income as a percent of operating revenue was 20.0 percent in 2015. This metric has varied over the past 6 years with a high of the 2015 figure of 20.0 percent reaching a low of 2.1 percent in 2019 before increasing to 10.0 percent in 2020. Similar to the O&M coverage ratio, these trends help to show how successfully operating revenue actually covered operating expenses, with higher positive numbers being the best and negative numbers showing need for improvement. In addition, these trends demonstrate the ability of the utility to invest in capital, whether through direct cash transfers or the issuance and servicing of debt.
- The debt service coverage ratio measures the amount of cash flow available to meet interest and principal payments. Typically, bond debt service coverage requires a minimum factor of 1.25 during the life of the loans. This ratio is calculated by dividing cash operating income (revenues less expenses before depreciation) by annual revenue bond expenses. The debt service coverage ratio for revenue bond debt ends 2015 at 5.93 and fluctuates year to year to a low of 3.09 in 2019 and a high of 10.45 in 2016. The ability of this ratio to remain at levels significantly higher than the bond covenant minimum of 1.25 indicates a stable capacity for new debt and will likely result in more favorable terms when entering the bond market.
- The current ratio is a measure of short-term liquidity or the City's ability to pay its current bills - it is calculated by dividing unrestricted current assets (excluding inventories and prepaid items) by current liabilities. A ratio of 1.0 indicates that the utility has exactly enough to pay its bills; higher values are desirable as they suggest an ability to pay large or unanticipated bills. The ratio begins at 1.5 in 2015 decreasing to 1.3 in 2016 before rebuilding to a high of 5.3 in 2019 and ending 2020 at 3.3 suggesting that the City has capacity to meets its short-term financial obligations.

10.3 Financial Plan

The sewer utility is responsible for generating sufficient revenue to meet all of its costs. The primary source of funding is derived from ongoing monthly service charges, with additional revenue coming from inspection fees, investment earnings, space and facilities leases, rents and charges and other miscellaneous revenues. The City controls the level of user service charges and, with City Council approval, can adjust user service charges as needed to meet financial objectives.

The financial plan can only confirm financial feasibility if it considers the total system costs of providing sewer services, both operating and capital. To meet these objectives, the following elements have been completed:

1. Capital Funding Plan. Identifies the total capital improvement plan (CIP) obligations of the planning period. The plan defines a strategy for funding the CIP, including an analysis of available resources from rate revenues, existing reserves, connection charges, debt financing, and any special resources that may be readily available (e.g., grants, developer contributions, etc.). The capital funding plan impacts the financial plan through the use of debt financing (resulting in annual debt service) and the assumed rate revenue made available for capital funding.
2. Financial Forecast. Identifies future annual non-capital costs associated with the operation, maintenance, and administration of the sewer system. Included in the financial plan is a reserve analysis that forecasts cash flow and fund balance activity, along with testing for satisfaction of actual or recommended minimum fund balance policies. The financial plan ultimately evaluates the sufficiency of utility revenues in meeting all obligations, including cash uses such as operating expenses, debt service, capital outlays, and reserve contributions, as well as any coverage requirements associated with long-term debt. The plan also identifies the future adjustments required to fully fund all utility obligations in the planning period.

10.3.1 Capital Funding Plan

To properly evaluate future capital funding needs, capital costs were escalated by 3.50 percent annually to the year of planned spending. The CIP used for this PLAN identifies $47.5M in project costs over the 10-year planning horizon from 2022-2031. The 20-year period through 2041 includes $86.0M in total project costs.

A summary of the 10-year and 20-year CIPs are shown in Table 10.3. As shown, each year has varied capital cost obligations depending on construction schedules and infrastructure planning needs. Table 10.4 provides more detail for the 10-year CIP.

Table 10.3 10-Year and 20-Year CIPs

Year	Escalated $
2022	$2,846,250
2023	8,923,304
2024	3,668,747
2025	8,166,921
2026	3,445,478
2027	2,174,553
2028	3,056,015
2029	9,010,924
2030	5,183,099
2031	1,057,949
10-Year Total	**$47,533,240**
2032 - 2041	38,425,499
20-Year Total	**$85,958,739**

Table 10.4 10-Year CIP (Escalated $)

Project	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Gravity Pipeline										
Northwest Fargo Street Upsize		$689,869								
Division Street Upsize		1,399,020								
Northwest 6th Place West Upsize		550,610								
Northwest 6th Place East Upsize		402,781								
Northwest 6th Avenue West Upsize		883,761								
Northwest 6th Avenue East Upsize		660,946								
Adams Street Upsize								729,512	928,133	
Pump Station										
South Prune Hills Pump Station Improvements		546,325								
West Camas Pump Station Improvements					605,720					
Crown View Hill Pump Station Improvements			565,446							
Main Pump Station Improvements									695,078	
Upgrade Pump Station Telemetry				2,004,723						
STEP										
STEP Main Condition Assessment/ Cleaning			910,257							
Maintenance										
WWTP R&R	2,070,000									
Pump Station R&R	621,000	642,735	665,231	688,514	712,612	737,553	763,368	790,085	817,738	846,359
Sewer Main R&R	155,250	160,684	166,308	172,128	178,153	184,388	190,842	197,521	204,435	211,590
STEP Tank R&R		1,091,578	1,129,784	1,169,326	1,210,252	1,252,611				
Treatment Plant										
Aeration Basin Improvements							478,377			
Secondary Clarifier Improvements								7,293,805		
Aeration Blower Replacement									2,537,715	
Disinfection Building / Hydraulic Improvements		1,341,174								
Effluent Pump Station Improvements							1,623,428			
Grit Separation / Odor Control Improvements				1,158,998						
Mechanical Dewatering Improvements					738,741					
Plant Drain Pump Station No. 1 Improvements		553,823								
SCADA Master Plan			231,722							
SCADA Improvements				740,152						
PLC & RIO Improvements				2,233,080						
Total	$2,846,250	$8,923,304	$3,668,747	$8,166,921	$3,445,478	$2,174,553	$3,056,015	$9,010,924	$5,183,099	$1,057,949

Notes:
Abbreviations: PLC - programable logic controller; R&R - programable logic controller; RIO - remote input/output; SCADA - supervisory control and data acquisition; WWTP - wastewater treatment plant.

10.4 Available Funding Assistance and Financing Resources

Feasible long-term capital funding strategies must be defined to ensure that adequate resources are available to fund the CIP identified in this PLAN. In addition to the City's resources, such as accumulated cash reserves, capital revenues, and rate revenues designated for capital purposes, capital needs can be met from outside sources, such as grants, low-interest loans, and bond financing. The following is a summary of the City's internal and external resources.

10.4.1 City Resources

Resources appropriate for funding capital needs include accumulated cash in the capital fund, rate revenues designated for capital spending purposes, developer contributions, and capital-related charges such as connection fee revenue. The first two resources will be discussed in the Fiscal Policies section of the Financial Forecast. Capital-related charges are discussed below.

10.4.1.1 System Development Charges

A connection charge such as the City's system development charge (SDC) refers to a one-time charge imposed on new customers as a condition of connecting to the sewer system. The purpose of the SDC is two-fold: 1) to promote equity between new and existing customers; and 2) to provide a source of revenue to fund capital projects. Revenue can only be used to fund utility capital projects or to pay debt service incurred to finance those projects. In 2021, the City charged all new customers an SDC dependent upon the location of the property. A charge of $2,493 per meter capacity equivalent (MCE) was charged for connections in the South Area while a charge of $4,420 per MCE was charged for connection in the North Shore Area.

10.4.1.2 Local Facilities Charges

While a connection charge is the manner in which new customers pay their share of system investment costs, local facilities charge funding is used to pay the costs of local facilities that connect each property to the system's infrastructure. Local facilities funding is often overlooked in rate forecasting because it is funded upfront by either connecting customers and developers, or through an assessment to properties, but never from rates.

A number of mechanisms can be considered toward funding local facilities. One of the following scenarios typically occurs: (a) the utility charges a connection fee based on the cost of the local facilities (under the same authority as the facilities assessment fee); (b) a developer funds an extension of the system to its development and turns those facilities over to the utility (contributed capital); or (c) a local assessment is set up called a Utility Local Improvement District (ULID/LID) or a Local Utility District (LUD), which collects tax revenue from benefited properties.

A local facilities charge (LFC) is a variation of the connection charge. It is a city-imposed charge to recover the cost related to service extension to local properties. Often called a front-footage charge and imposed on the basis of footage of the main "fronting" a particular property, it is usually implemented as a reimbursement mechanism to a city for the cost of a local facility that directly serves a property. It is a form of connection charge and thus can accumulate up to 10 years of interest. It typically applies in instances when no developer-installed facilities are needed through developer extension due to the prior existence of available mains already serving the developing property.

The developer extension is a requirement that a developer install on-site and sometimes off-site improvements as a condition of extending service. These are in addition to the connection charge required and must be built to City standards. Part of the agreement between the City and the developer planning to extend service might include a latecomer agreement, resulting in a latecomer charge to new connections for the developer extension.

Latecomer charges are a variation of developer extensions, whereby new customers connecting to a developer-installed improvement make a payment to the City based on their share of the developer's cost. The City passes this charge on to the developer who installed the facilities. As part of the developer extension process, this defines the allocation of costs and records latecomer obligations on the title of affected properties. No interest is allowed, and the reimbursement agreement cannot exceed 20 years in duration.

ULID/LID is another mechanism for funding infrastructure that assesses benefited properties based on the special benefit received by the construction of specific facilities. Most often used for local facilities, some ULIDs also recover related general facilities costs. Substantial legal and procedural requirements can make this a relatively expensive process, and there are mechanisms by which a ULID can be rejected.

10.4.2 Outside Resources

This section outlines various grant, loan, and bond opportunities available to the City through federal and state agencies to fund the CIP identified in the Plan.

10.4.2.1 Grants and Low-Cost Loans

Historically, federal and state grant programs were available to local utilities for capital funding assistance. However, these assistance programs have been mostly eliminated, substantially reduced in scope and amount, or replaced by loan programs. Remaining grant programs are generally lightly funded and heavily subscribed. Nonetheless, the benefit of low-interest loans makes the effort of applying worthwhile.

Appendix L to this Plan contains a document entitled "Funding Programs for Drinking Water and Wastewater Projects; Updated 2-14-2022". This document is maintained by the State of Washington's Department of Commerce and contains details on government programs, eligibility requirements, and contact information, should the City wish to inquire about program offerings and eligibility requirements.

10.4.2.2 Bond Financing

General Obligation Bonds - General obligation (G.O.) bonds are bonds secured by the full faith and credit of the issuing agency, committing all available tax and revenue resources to debt repayment. With this high level of commitment, G.O. bonds have relatively low interest rates and few financial restrictions. However, the authority to issue G.O. bonds is restricted in terms of the amount and use of the funds, as defined by the Washington constitution and statute. Specifically, the amount of debt that can be issued is linked to assessed valuation.

Revised Code of Washington (RCW) 39.36.020 states:

- (2)(a)(ii) Counties, cities, and towns are limited to an indebtedness amount not exceeding one and one half percent of the value of the taxable property in such counties, cities, or towns without the assent of three-fifths of the voters therein voting at an election held for that purpose.
  (b) In cases requiring such assent counties, cities, towns, and public hospital districts are limited to a total indebtedness of two and one-half percent of the value of the taxable property therein.

While bonding capacity can limit the availability of G.O. bonds for utility purposes, these can sometimes play a valuable role in project financing. A utility rate savings may be realized through two avenues: the lower interest rate and related bond costs, and the extension of repayment obligation to all tax-paying properties (not just developed properties) through the authorization of an ad valorem property tax levy.

Revenue Bonds - Revenue bonds are commonly used to fund utility capital improvements. The debt is secured by the revenues of the issuing utility. With this limited commitment, revenue bonds typically bear higher interest rates than G.O. bonds and require security conditions related to the financial performance (added bond debt service coverage) and may require maintenance of dedicated reserves (a bond reserve). The City agrees to satisfy these requirements by resolution as a condition of bond sale.

Revenue bonds can be issued in Washington without a public vote. There is no bonding limit, except perhaps the practical limit of the utility's ability to generate sufficient revenue to repay the debt and provide coverage. In some cases, poor credit might make issuing revenue bonds problematic.

10.4.2.3 Capital Financing Strategy

An ideal capital financing strategy would include the use of grants and low-cost loans when debt issuance is required. However, these resources are very limited and competitive in nature and do not provide a reliable source of funding for planning purposes. It is recommended that the City pursue these funding avenues but for planning purposes assume revenue bond financing to meet the needs which can't be met by available cash resources. The capital financing strategy developed to fund the CIP identified in this Plan assumes the following funding resources:

- Accumulated cash reserves, which may include proceeds from previously issued bonds,
- Transfers of excess cash (over minimum balance targets) from the Operating Fund,
- System development charge revenues, and
- Interest earned on Construction Fund balances and other miscellaneous capital resources.

The cash resources described above are anticipated to fund 61.29 percent of the 10-year CIP and 78.59 percent of the 20-year CIP. The remaining funding is assumed to come from new debt obligations. Table 10.5 presents the 10-year and 20-year capital financing strategy.

Table 10.5 10-Year and 20-Year Capital Financing Strategy

Year	Capital Expenditures Escalated	Revenue Bond Financing	Cash Funding	Total Financial Resources
2022	$2,846,250	-	$2,846,250	$2,846,250
2023	8,923,304	2,500,000	6,423,304	8,923,304
2024	3,668,747	-	3,668,747	3,668,747
2025	8,166,921	6,900,000	1,266,921	8,166,921
2026	3,445,478	-	3,445,478	3,445,478
2027	2,174,553	-	2,174,553	2,174,553
2028	3,056,015	-	3,056,015	3,056,015
2029	9,010,924	9,000,000	10,924	9,010,924
2030	5,183,099	-	5,183,099	5,183,099
2031	1,057,949	-	1,057,949	1,057,949
Subtotal	**$47,533,240**	**$18,400,000**	**$29,133,240**	**$47,533,240**
2032 - 2041	38,425,499	-	38,425,499	38,425,499
Total	**$85,958,739**	**$18,400,000**	**$67,558,739**	**$85,958,739**

10.5 Financial Forecast

The financial forecast, or revenue requirement analysis, forecasts the amount of annual revenue that needs to be generated by user rates. The analysis incorporates operating revenues, O&M expenses, debt service payments, rate-funded capital needs, and any other identified revenues or expenses related to operations. The objective of the financial forecast is to evaluate the sufficiency of the current level of rates. In addition to annual operating costs, the revenue needs also include debt covenant requirements and specific fiscal policies and financial goals of the City.

The analysis determines the amount of revenue needed in a given year to meet that year's expected financial obligations. For this analysis, two revenue sufficiency tests have been developed to reflect the financial goals and constraints of the City: cash needs must be met; and debt coverage requirements must be realized. In order to operate successfully with respect to these goals, both tests of revenue sufficiency must be met.

Cash Test: The cash flow test identifies all known cash requirements for the City in each year of the planning period. Typically, these include O&M expenses, debt service payments, rate-funded system reinvestment funding or directly funded capital outlays, and any additions to specified reserve balances. The total annual cash needs of the City are then compared to projected cash revenues using the current rate structure. Any projected revenue shortfalls are identified and the rate increases necessary to make up the shortfalls are established.

Coverage Test: The coverage test is based on a commitment made by the City when issuing revenue bonds and some other forms of long-term debt. For the purposes of this analysis, revenue bond debt is assumed for any needed debt issuance. As a security condition of issuance, the City would be required per covenant to agree that the revenue bond debt would have a higher priority for payment (a senior lien) compared to most other expenditures; the only outlays with a higher lien are O&M expenses. Debt service coverage is expressed as a multiplier of the annual revenue bond debt service payment. For example, a 1.00 coverage factor would imply that no additional cushion is required. A 1.25 coverage factor means revenue must be sufficient to pay O&M expenses, annual revenue bond debt service payments, and an additional 25 percent of annual revenue bond debt service payments. The excess cash flow derived from the added coverage, if any, can be used for any purpose, including funding capital projects. Targeting a higher coverage factor can help the City achieve a better credit rating and provide lower interest rates for future debt issues.

In determining the annual revenue requirement, both the cash and coverage sufficiency tests must be met, and the test with the greatest deficiency drives the level of needed rate increase in any given year.

10.5.1 Current Financial Structure

The City maintains a fund structure and implements financial policies that target management of a financially viable and fiscally responsible sewer system.

10.5.1.1 Fiscal Policies

A summary of the key financial policies employed by the City, as well as those recommended and incorporated in the financial program, are discussed below.

Operating Fund: Operating reserves are designed to provide a liquidity cushion to ensure that adequate cash working capital will be maintained to deal with significant cash balance fluctuations, such as seasonal fluctuations in billings and receipts, unanticipated cash expenses, or lower than expected revenue collections. Like other types of reserves, operating reserves also serve another purpose: they help smooth rate increases over time. Target funding levels for an operating reserve are generally expressed as a certain number of days of O&M expenses, with the minimum requirement varying with the expected revenue volatility. Industry practice for utility operating reserves ranges from 30 days (8 percent) to 120 days (33 percent) of O&M expenses, with the lower end more appropriate for utilities with stable revenue streams and the higher end more appropriate for utilities with significant seasonal or consumption-based fluctuations.

This financial plan targets a minimum balance in the sewer utility Operating Fund equal to 60 days of O&M expenses.

Capital Fund: A utility capital contingency reserve is an amount of cash set aside in case of an emergency should a piece of equipment or a portion of the utility's infrastructure fail unexpectedly. The reserve also could be used for other unanticipated capital needs, including capital project cost overruns. Industry practices range from maintaining a balance equal to 1 to 2 percent of fixed assets, an amount equal to a five-year rolling average of CIP costs, or an amount determined sufficient to fund equipment failure (other than catastrophic failure). The final target level should balance industry standards with the risk level of the City.

The City currently aims to maintain a capital fund balance target of $750,000 and is the target used in this financial plan.

System Reinvestment: System reinvestment funding promotes system integrity through ongoing repair and replacement of system infrastructure. Ideally, a detailed asset management plan would guide the level of rate funded system reinvestment, however, in absence of this level of effort, annual depreciation expense is commonly used as a measure of the decline in asset value associated with routine use of the system. Particularly for utilities that do not already have an explicit system reinvestment policy in place, implementing a funding level based on full depreciation expense could significantly impact rates. An alternative benchmark is annual depreciation expense net of debt principal payments on outstanding debt. This approach recognizes that customers are still paying for certain assets through the debt component of their rate and intends to avoid simultaneously charging customers for an asset and its future replacement. The specific benchmark used to set system reinvestment funding targets is a matter of policy that must balance various objectives, including managing rate impacts, keeping long-term costs down, and promoting "generational equity" (i.e., not excessively burdening current customers with paying for facilities that will serve a larger group of customers in the future).

The City does not currently have a policy in place for system reinvestment funding. No dedicated system reinvestment funding is assumed in this financial plan; however, on average, the City is able to fund approximately $2.0M annually through rates from 2022 through 2041. Dedicated system reinvestment funding is recommended for consideration during future policy review and rate planning.

Debt Management: It is prudent to consider policies related to debt management as part of a broader utility financial policy structure. Debt management policies should be evaluated and formalized, including the level of acceptable outstanding debt, debt repayment, bond coverage, and total debt coverage targets. The City has one outstanding sewer revenue bond, which will be fully redeemed in 2035. This bond carries a coverage requirement of 1.25. In addition to revenue bonds, the City has four junior lean debt obligations without a coverage requirement. While not an official policy, the City should target debt coverage ratio of 1.00 or greater on total debt to make sure enough cash is generated for the repayment of all debt.

10.5.1.2 Financial Forecast

The financial forecast is primarily based upon the City's 2022 budget and takes into consideration other key factors and assumptions needed to develop a complete portrait of the City's annual sewer utility financial obligations. The following is a list of the key revenue and expense factors and assumptions used to develop the financial forecast.

- Growth - Rate revenue escalation is based on the forecast of annual average flow provided in Chapter 3 of this PLAN. On average, annual growth for the forecast period is 2.14 percent.
- Revenue - The City has two general revenue sources: 1) sewer service charges (rate revenue); and 2) miscellaneous (non-rate) revenue. In the event of a forecasted annual shortfall, rate revenue can be increased to meet the annual revenue requirement. For the purpose of this financial forecast, rate revenues are forecasted to increase with customer growth. Non-rate revenues are forecasted to increase with either customer growth or general cost inflation.

- System Development Charge Revenue - The current SDC is forecast to generate revenue between $1.1M in 2022 and $1.7M in 2041 collected from an average of 424 new meter capacity equivalents per year.
- Expenses - O&M expense projections are based on the City's 2022 budget and forecast to increase with general cost inflation of 2.0 percent, labor cost inflation increases of 3.0 percent, and benefit cost inflation increases of 5.0 percent in subsequent years. Budget figures were used for taxes in 2022; future taxes are calculated based on forecasted revenues and prevailing tax rates.
- Existing Debt - The City's sewer utility currently has five outstanding debt issues, including one revenue bond, three PWTF loans, and one Department of Ecology loan. The revenue bond payments are on average $1.5M per year 2022 through 2035. PWTF payments range from $816,000 in 2022 to $190,000 in 2032. DOE loan payments range from $350,000 in 2021 to $175,000 in 2032. The total annual existing debt service obligations begin 2022 at $2.7M and are reduced to $1.5M in 2035, the year of final existing debt redemption.
- Future Debt - The capital financial strategy developed for this PLAN forecasts the need for $18.4M in new debt proceeds in three separate instances throughout the twenty-year forecast. The analysis performed assumes all new debt is through revenue bond financing. Annual new debt service obligations begin in 2023 at $221,000 increasing to $1.6M by 2029.
- Transfers to Capital - Operating fund balance above the minimum requirement is assumed to be available to fund capital projects and projected to be transferred to the Capital Fund each year. On average, the utility transfers $2.2M to the Capital Fund annually from 2022 to 2041.

Although the financial plan is completed through 2041, the rate strategy focuses on the shorter-term planning period of 2022 through 2031. It is recommended that the City revisit the proposed rates every 2 to 3 years to ensure that the rate projections developed remain adequate. Any significant changes should be incorporated into the financial plan and future rates should be adjusted as needed.

Table 10.6, following, summarizes the annual revenue requirements based on the forecast of revenues, expenditures, fund balances, and fiscal policies.

Table 10.6 11-Year Financial Forecast

Revenue Requirement	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Revenues										
Rate Revenues Under Existing Rates	$8,497,745	$8,679,362	$8,864,860	$9,054,322	$9,247,834	$9,445,482	$9,647,354	$9,853,541	$10,064,134	$10,279,228
Non-Rate Revenues	371,282	358,954	358,973	376,704	380,896	347,830	359,665	364,879	384,018	221,005
Total Revenues	**$8,869,027**	**$9,038,316**	**$9,223,833**	**$9,431,026**	**$9,628,730**	**$9,793,312**	**$10,007,019**	**$10,218,420**	**$10,448,152**	**$10,500,233**
Expenses										
Cash Operating Expenses	$5,281,720	$5,468,388	$5,624,604	$5,786,121	$5,952,570	$6,123,721	$6,301,205	$6,484,319	$6,673,633	$6,865,930
Existing Debt Service	2,695,128	2,695,053	2,690,328	2,688,603	2,684,627	2,678,403	2,629,788	2,074,276	2,074,528	2,071,804
New Debt Service		220,505	220,505	829,100	829,100	829,100	829,100	1,622,920	1,622,920	1,622,920
Total Expenses	**$7,976,848**	**$8,383,946**	**$8,535,438**	**$9,303,824**	**$9,466,298**	**$9,631,224**	**$9,760,093**	**$10,181,515**	**$10,371,080**	**$10,560,654**
Total Surplus (Deficiency)	**$892,179**	**$654,369**	**$688,395**	**$127,202**	**$162,432**	**$162,088**	**$246,926**	**$36,905**	**$77,071**	**$(60,421)**
Annual Rate Adjustment	**3.30%**	**3.30%**	**1.75%**	**1.75%**	**1.75%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**
Cumulative Annual Rate Adjustment	**3.30%**	**6.71%**	**8.58%**	**10.48%**	**12.41%**	**12.41%**	**12.41%**	**12.41%**	**12.41%**	**12.41%**
Rate Revenues After Rate Increase	$8,778,171	$9,261,651	$9,625,137	$10,002,888	$10,395,465	$10,617,641	$10,844,564	$11,076,338	$11,313,066	$11,554,853
Additional Taxes from Rate Increase	7,206	14,964	19,537	24,376	29,492	30,122	30,766	31,423	32,095	32,781
Net Cash Flow After Rate Increase	**$1,165,398**	**$1,221,696**	**$1,429,135**	**$1,051,392**	**$1,280,572**	**$1,304,125**	**$1,413,371**	**$1,228,279**	**$1,293,908**	**$1,182,423**
Coverage After Rate Increases	3.54	3.25	3.38	2.55	2.68	2.69	2.74	2.03	2.08	1.98

The financial forecast indicates that at existing rate levels the utility becomes deficient in 2031 as new debt is added to fund the capital program. This financial analysis recognizes the annual 3.30 percent adopted rate increases in 2022 and 2023. In addition to the adopted increases annual increases of 1.75 percent are needed starting in 2024 through 2026 to meet the forecast annual operating and capital needs of the system.

10.5.2 City Funds and Reserves

Table 10.7 shows a summary of the projected Operating Fund and Capital Fund ending balances through 2031 based on the rate forecasts presented above. The Operating Fund is maintained at a minimum of 60 days of O&M expenses, and the Capital Fund balance continues to exceed the annual $750,000 target.

Table 10.7 Ending Cash Balance Summary

Ending Fund Balances	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Operating Fund	$868,228	$898,913	$924,592	$951,143	$978,505	$1,006,639	$1,035,814	$1,065,915	$1,097,036	$1,128,646
Capital Fund	5,976,844	1,934,563	860,365	1,826,388	883,982	1,249,973	878,759	3,387,097	865,896	2,335,899
Total	**$6,845,072**	**$2,833,476**	**$1,784,957**	**$2,777,531**	**$1,862,487**	**$2,256,612**	**$1,914,574**	**$4,453,012**	**$1,962,931**	**$3,464,545**

10.6 Current and Projected Rates

10.6.1 Current Rates

The City's current rate structure consists of a fixed monthly charge based on customer class and a variable charge per hundred cubic feet (ccf) for all use. Customer located outside the City limits have an outside City multiplier of 1.50 added to both the fixed monthly charge and the variable charge of their rates. Table 10.8 shows the existing rate schedule.

Table 10.8 Existing Schedule of Rates

2021 Monthly Rates	
Base Rate	**per Account**
Residential	
Inside City	$27.26
Outside City	40.89
Commercial / Industrial	
Inside City	$13.07
Outside City	19.62
Volume Charge	**per ccf**
Residential	
Inside City	$4.15
Outside City	6.24
Commercial / Industrial	
Inside City	$5.55
Outside City	8.33

10.6.2 Projected Rates

The financial forecast discussed above indicates that while the sewer utility is covering all financial obligations in the near term, with the addition of new debt, rate increases are needed to satisfy all future financial responsibilities. In addition to the adopted 3.3 percent rate increase in 2022 and 2023, a rate strategy of 1.75 percent annually from 2024 through 2026 is recommended to satisfy this forecast deficiency. Table 10.9 shows the projected rates with increases applied uniformly to all rate components in all classes.

Table 10.9 Proposed Schedule of Rates

Monthly Rates	Existing	Adopted		Proposed							
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Base Rate (per Account)											
Residential											
Inside City	$27.26	$28.16	$29.09	$29.60	$30.12	$30.65	$30.65	$30.65	$30.65	$30.65	$30.65
Outside City	40.89	42.24	43.63	44.39	45.17	45.96	45.96	45.96	45.96	45.96	45.96
Commercial / Industrial											
Inside City	13.07	13.50	13.95	14.19	14.44	14.69	14.69	14.69	14.69	14.69	14.69
Outside City	19.62	20.27	20.94	21.31	21.68	22.06	22.06	22.06	22.06	22.06	22.06
Volume Charge (per cfs)											
Residential											
Inside City	$4.15	$4.29	$4.43	$4.51	$4.59	$4.67	$4.67	$4.67	$4.67	$4.67	$4.67
Outside City	6.24	6.45	6.66	6.78	6.90	7.02	7.02	7.02	7.02	7.02	7.02
Commercial / Industrial											
Inside City	5.55	5.73	5.92	6.02	6.13	6.24	6.24	6.24	6.24	6.24	6.24
Outside City	8.33	8.60	8.88	9.04	9.20	9.36	9.36	9.36	9.36	9.36	9.36

10.7 Affordability

The Washington State Department of Health and the Department of Commerce Public Works Board use an affordability index to prioritize low-cost loan awards depending on whether rates exceed 2.00 percent of the median household income for the service area. The median household income for the City, expressed in 2019 dollars, was $111,584 between 2015 and 2019 according to the U.S. Census Bureau. The 2019 value is escalated based on the 2020 and 2021 Employment Cost Index Wages and Salaries index and utilizes the 2020 and 2021 two-year average of 2.15 percent to project the median household income in future years starting in 2022. Table 10.10 presents the City's monthly sewer bill projected to 2031, tested against the 2.00 percent monthly affordability threshold.

Table 10.10 Community Affordability Test

Year	Inflation	Median HH Income	2% Monthly Threshold	Projected Monthly Bill(1)	% of Median HH Income
2019		$111,584	$185.97	$52.78	0.57%
2020	2.22%	114,065	190.11	54.53	0.57%
2021	2.08%	116,439	194.07	56.31	0.58%
2022	2.15%	118,945	198.24	58.19	0.59%
2023	2.15%	121,506	202.51	60.10	0.59%
2024	2.15%	124,121	206.87	61.17	0.59%
2025	2.15%	126,793	211.32	62.25	0.59%
2026	2.15%	129,522	215.87	63.34	0.59%
2027	2.15%	132,310	220.52	63.34	0.57%
2028	2.15%	135,157	225.26	63.34	0.56%
2029	2.15%	138,067	230.11	63.34	0.55%
2030	2.15%	141,038	235.06	63.34	0.54%
2031	2.15%	144,074	240.12	63.34	0.53%

Notes:
(1) Average monthly bill assumes 7ccf water use.

Applying the 2.00 percent test, the City's rates are forecasted to remain within the indicated affordability range through 2031.

10.8 Conclusion

The results of this analysis indicate that rates must increase to provide revenue sufficient to cover all utility financial obligations, including the addition of new debt and partial cash funding of the capital program through 2031. In addition to the adopted annual increases of 3.30 percent in 2022 and 2023, annual 1.75 percent adjustments from 2024 through 2026 should provide for continued financial viability while maintaining generally affordable rates.

It is important to remember that the analysis performed in this chapter assumes growth rates from Chapter 3 of this Plan. If the future growth rates change, the existing rate strategy may need to be updated and revised.

It is recommended that the City regularly review and update the key underlying assumptions that compose the multi-year financial plan to ensure that adequate revenues are collected to meet the City's total financial obligations.

Staff Report

October 3, 2022 Council Workshop Meeting

2023 Community Development Block Grant (CDBG) Application
Presenter: James Carothers, Engineering Manager
Time Estimate: 10 Minutes

Phone	Email
360.817.7230	jcarothers@cityofcamas.us

BACKGROUND: The Community Development Block Grant (CDBG) is a funding opportunity originating from the U.S. Department of Housing and Urban Development (HUD). Funds are available through a competitive grant application process for a limited pool of available funds.

Eligibility is based on economic need as determined using information collected by the U.S. Census Bureau. Using data from the most recent U.S. Census, HUD determines the areas of the City in which projects receiving CDBG funding must be located.

Since 1985, Camas has secured 44 separate CDBG Grants totaling approximately $7 million.

SUMMARY: Staff evaluated four potential projects within the eligible areas in Camas. The projects were evaluated based on pavement condition, traffic volume, age and condition of water and sanitary sewer infrastructure, proximity to public spaces, and the amount of City funded work that would be included in the project scope. The City funded work counts as matching funds and increases the odds of the project receiving grant funding.

All four potential projects would reconstruct damaged street and sidewalk, and three of the four would also replace old and undersized water line. One would replace an old and leaking sewer line. Utilities are only eligible as matching funds for the grant. Matching funds would be supplied from Staff time, City Water and Sewer Utility Funds and the General Fund. Descriptions of work and estimated project costs are shown in the table below:

Option	Location	Project Limits	Work Description	CDBG Funding	City Funding	Match Percentage	Funding Source
1	NW Benton St.	NW 14th Ave to NW 16th Ave.	Road and Sewer Line	$280,000	$115,000	29%	Sewer Fund
2	NW 19th Ave.	NW Benton St. to Division St.	Road and Water Line	$250,000	$185,000	42%	Water Fund
3	NW Benton St.	NW 17th Ave to NW 18th Ave.	Road and Water Line	$180,000	$100,000	35%	Water Fund
4	NW 21st Ave.	NW Couch St. to NW Benton St.	Road and Water Line	$170,000	$120,000	41%	Water Fund

EQUITY CONSIDERATIONS:

What are the desired results and outcomes for this agenda item?

This informational agenda item serves as the first of two required public meetings. Ultimately, staff is seeking direction from Council regarding whether to apply for CDBG grant funding and, if so, determining the appropriate project. The Council decision should take place following the October 17, 2022 public hearing.

What's the data? What does the data tell us?

Review of as-built plans and field evaluations identified four potential projects that address significant infrastructure deficiencies and satisfy the grant application requirements.

How have communities been engaged? Are there opportunities to expand engagement?

The community is being engaged by mail and through the city website, and it is recommended by staff that public comments be allowed during the Council meeting.

Who will benefit from, or be burdened by this agenda item?

All City constituents would benefit by a grant funded project that would improve all modes of travel in and through the neighborhood.

What are the strategies to mitigate any unintended consequences?

Through internal review of costs and community impact for each potential project location.

Does this agenda item have a differential impact on underserved populations, people living with disabilities, and/or communities of color? Please provide available data to illustrate this impact.

The purpose of the CDBG program is to fund improvements within economically disadvantaged areas. Using data from the most recent U.S. Census, HUD determines which areas in Camas are eligible for CDBG Funding.

Will this agenda item improve ADA accessibilities for people with disabilities?

Yes, all of the identified projects include rehabilitation of the affected streets, and street improvement projects are required to be inclusive of ADA improvements.

What potential hurdles exists in implementing this proposal (include both operational and political)?

No operational or political hurdles are expected, as all potential projects rehabilitate and improve infrastructure elements in areas identified as Low to Moderate Income by HUD. Acquisition of additional right-of-way or other property rights are not required for any of the potential products.

How will you ensure accountabilities, communicate, and evaluate results?

Camas Staff have a policy in place to share proposed CDBG project elements with affected residents, and to encourage public input by means of a scheduled public hearing for each project application that gets submitted for grant funding.

How does this item support a comprehensive plan goal, policy or other adopted resolution?

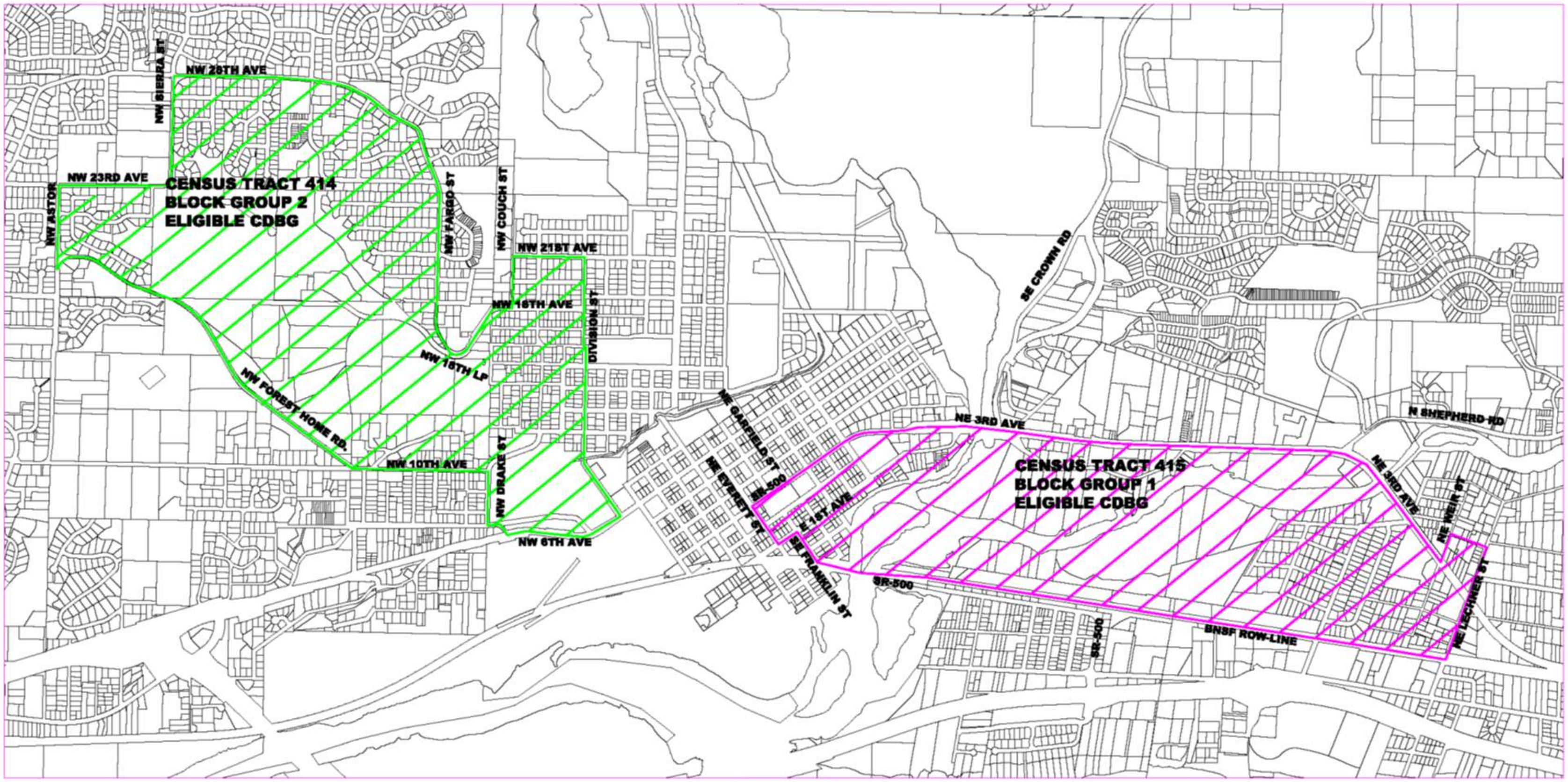
This project maintains the transportation system at a level that preserves user safety… and the overall integrity of the system, in accordance with Policy T-1.4 of the 2035 Comprehensive Plan.

BUDGET IMPACT: Budget impact will depend on the amount of City matching funds included in the scope of the selected project. A project that does not receive grant funding will not be constructed.

RECOMMENDATION: This initial meeting is informational . Following the public hearing on October 17, 2022, staff will be recommending that Council select a project and authorize submittal of a pre-application and a formal application to receive CDBG grant funding.

2023 COMMUNITY DEVELOPMENT BLOCK GRANT (CDBG) APPLICATION

ELIGIBLE CDBG NEIGHBORHOODS-CAMAS



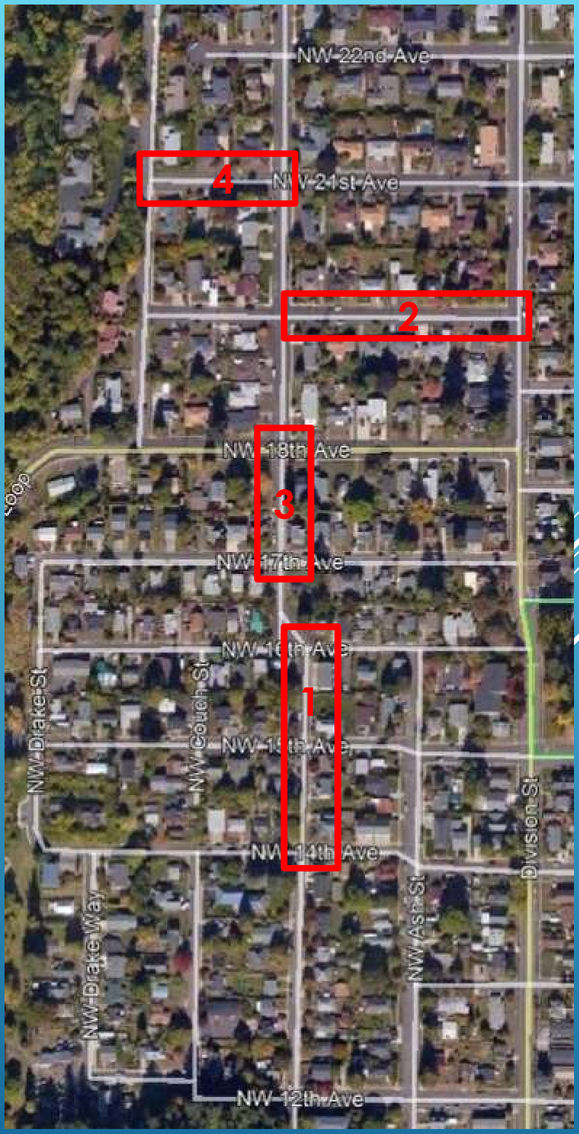
CENSUS TRACT 414 BLOCK GROUP 2 2019 INFO:
GEO ID: 530110414002
TRACT & BLOCK GROUP: 414002
POPULATION OFM: 2476.810033
HOUSING UNITS FROM GIS: 953
TOTAL POPULATION: 2306
MEDIAN AGE: 38.6 (FEMALE=40.6, MALE= 36.2)
POPULATION AGE 65+: 312
POPULATION AGE 65+ AS %= 13.53

CENSUS TRACT 415 BLOCK GROUP 1 2019 INFO:
GEO ID: 530110415001
TRACT & BLOCK GROUP: 415001
POPULATION OFM: 1008.379998
HOUSING UNITS FROM GIS: 434
TOTAL POPULATION: 1037
MEDIAN AGE: 36.7 (FEMALE=38.3, MALE= 34.6)
POPULATION AGE 65+: 165
POPULATION AGE 65+ AS %= 15.91

DRAWN BY JDM 6/3/19 2019 DATA FROM CLARK COUNTY HOMEPAGE

PROJECT AREAS EVALUATED

OPTION	STREET	PROJECT LIMITS	CDBG FUNDING	CITY FUNDING	TOTAL COST
1	NW BENTON ST	NW 14TH AVE TO NW 16TH AVE	$280,000	$115,000	$395,000
2	NW 19TH AVE	NW BENTON ST TO DIVISION ST	$250,000	$185,000	$435,000
3	NW BENTON ST	NW 17TH AVE TO NW 18TH AVE	$180,000	$100,000	$280,000
4	NW 21ST AVE	NW COUCH ST TO NW BENTON ST	$170,000	$120,000	$290,000



OPTION 1

NW BENTON ST AT NW 16^{TH} AVE, LOOKING SOUTH

NW BENTON ST, LOOKING NORTH TO NW 16^{TH} AVE

NW BENTON ST, LOOKING SOUTH TO NW 15^{TH} AVE

NW BENTON ST, LOOKING SOUTH TO NW 14^{TH} AVE

OPTION 2

NW 19TH AVE, LOOKING WEST TO NW BENTON ST

NW 19TH AVE, LOOKING WEST TO NW BENTON ST

NW 19TH AVE, LOOKING EAST TO DIVISION ST

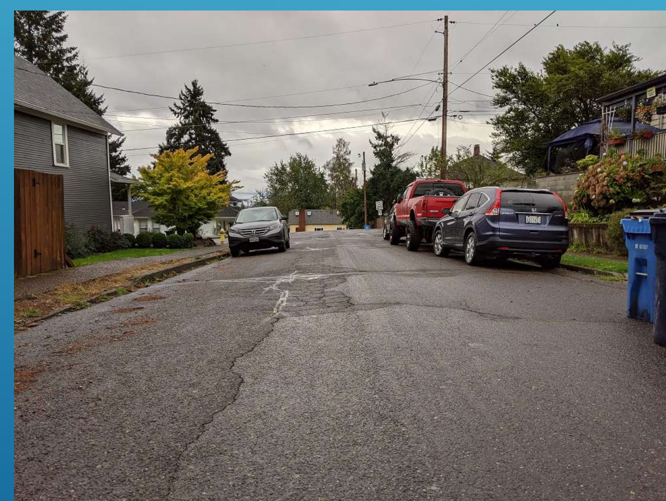
NW 19TH AVE, LOOKING EAST TO DIVISION ST

OPTION 3

NW BENTON ST AT NW 18TH AVE, LOOKING SOUTH

NW BENTON ST AT NW 18TH AVE, LOOKING SOUTH

NW BENTON ST AT NW 17TH AVE, LOOKING WEST



NW BENTON ST, LOOKING SOUTH TO NW 17TH AVE

OPTION 4

NW 21ST AVE AT NW BENTON, LOOKING WEST

NW 21ST AVE AT NW COUCH ST, LOOKING EAST

NW 21ST AVE, LOOKING EAST TO NW BENTON ST

NW 21ST AVE, LOOKING WEST TO NW COUCH ST

2023 CDBG IMPROVEMENTS
OPTION 1 : NW BENTON STREET – NW 14TH TO NW 16TH AVENUE

PROJECT WORK BOUNDARY	SIDEWALK / ADA IMPROVEMENTS
SEWER LINE REHABILITATION	STREET SURFACING IMPROVEMENT
EXISTING SEWER LINE	

City of Camas WASHINGTON

NEXT STEPS

- PUBLIC HEARING: 10/17/22
- PRE-APPLICATION DUE: 10/31/22
- FINAL APPLICATION DUE: 12/1/22

Staff Report

October 3, 2022 Council Workshop Meeting

Lakes Management Plan Professional Services Agreement Amendment No. 4
Presenter: Steve Wall, Public Works Director
Time Estimate: 15 min

Phone	Email
360.817.7899	swall@cityofcamas.us

BACKGROUND: The City Council adopted Resolution 20-016 in late 2020 providing direction to staff to, among other things, develop a plan to investigate current water quality conditions and propose management strategies to improve the water quality within Lacamas, Round and Fallen Leaf Lakes. Since early 2021, the City Council has approved one initial Professional Services Agreement and three subsequent amendments with Geosyntec Consultants, Inc. for a multi-phased approach to complete a comprehensive Lakes Management Plan with the goal of improving water quality in the three Lakes.

SUMMARY: Geosyntec Consultants, Inc. have provided the attached Scope of Work and Fee Estimate as the last phase of work (Amendment No. 4) to complete the Lakes Management Plan. This phase of the work will include analysis of the data being collected over the 12-month water quality sampling period, continuance of public involvement, and ultimately complete a Lakes Management Plan in accordance with the Department of Ecology criteria. This last phase of work is estimated to cost $189,500. Included in the Budget Impact section of this staff report is a full summary of the individual phases of the project and the costs for each, as well as the current revenue sources in support of the project.

EQUITY CONSIDERATIONS:

What are the desired results and outcomes for this agenda item?

Inform Council of the scope of work and cost to complete the Lakes Management Plan.

What's the data? What does the data tell us?

N/A

How have communities been engaged? Are there opportunities to expand engagement?

The overall Project has included multiple Open Houses, surveys and public outreach. The proposed scope of work allows for additional opportunities for public input.

Who will benefit from, or be burdened by this agenda item?

The community in its entirety will benefit from completion of the Lakes Management Plan.

What are the strategies to mitigate any unintended consequences?

The scope of work and development of the Lakes Management Plan is intended to be very deliberate in the information gathered and involvement from the community such that any proposed implementation and management measures identified in the Plan will be supported by the community.

Does this agenda item have a differential impact on underserved populations, people living with disabilities, and/or communities of color? Please provide available data to illustrate this impact.

N/A

Will this agenda item improve ADA accessibilities for people with disabilities?

N/A

What potential hurdles exists in implementing this proposal (include both operational and political)?

This specific proposal, including work provided by the City's consultant, requires additional funding to be provided with local funds (Stormwater Rates or General Fund) as we do not currently have any grant money for this phase.

How will you ensure accountabilities, communicate, and evaluate results?

As discussed above, significant public engagement is included in the scope of work with the intent to communicate and discuss future management and water quality improvement options.

How does this item support a comprehensive plan goal, policy or other adopted resolution?

This item supports multiple goals within Chapter 3 of the City's Comprehensive Plan. Additionally, this item is a direct result of Council's adoption of Resolution 20-016.

BUDGET IMPACT: The total cost of this Amendment is $189,500. Additional Stormwater Funds, or other funds, will need to be included in the Fall Omnibus to cover the anticipated expenses.

Staff anticipates this will be the final amendment necessary to complete the Lakes Management Plan as originally envisioned and discussed with the City Council and Public in

2020. For Council's information, shown below is a summary of all Project expenses by Phase and a summary of the revenues used to date to support the project.

Project Expense Summary

Consultant Task	Status	Contract Amount	Actual Spent (as of 7/1/2022)	Remaining (as of 7/1/2022)
Phase 1 (Background Data Collection/Phase 2 Scope Development)	Completed	$106,400	$106,400	$0
Phase 2A (QAPP)	Completed	$22,700	$16,299	$6,401
Phase 2B, Part 1 (Field Work)	In-Progress	$294,898	$83,290	$211,608
Phase 2B, Part 2 (Public Outreach and Initial Plan Coordination)	In-Progress	$127,500	$73,053	$54,447
Phase 2B, Part 3 (Data Analysis/Plan Completion)	Not-Started	$189,500	$0	$189,500
	Totals	**$740,998**	**$279,042**	**$461,956**

Project Revenue Summary

Sources	Amount
City Stormwater Funds - 2021/2022	$300,000
Ecology Freshwater Algae Control Program Grant	$66,666
2021 State Budget ARPA Appropriation	$155,000
City Stormwater Funds - 2023 (Proposed)	$219,332
Total	**$740,998**

RECOMMENDATION: This item is for Council's information only. Staff recommends placing this item on the October 17, 2022 Regular Meeting Consent Agenda for Council's consideration.

Geosyntec consultants

920 SW 6th Ave, Suite 600
Portland, Oregon 97204
PH 503.222.9518
FAX 971.271.5884
www.geosyntec.com

VIA ELECTRONIC MAIL

August 16, 2022

Mr. Steve Wall, P.E.
Public Works Director
City of Camas
616 NE 4th Avenue
Camas, WA 98607

Subject: Phase 2B Part 3 Draft Workplan, Lake Management Planning

Dear Mr. Wall,

On behalf of Geosyntec Consultants, Inc. (Geosyntec), we are pleased to present you with our draft scope of work for Phase 2B (Part 3) of the Lake Management Planning support to the City of Camas (City). Geosyntec's team with MacKay Sposito and JLA have developed this draft scope of work and budget for Lake Management Planning for Lacamas, Round and Fallen Leaf Lakes.

This workplan does not include conducting the field work, which was scoped and approved separately.

Introduction

This workplan outlines the tasks needed to complete a Lake Management Plan, following the Washington State Department of Ecology (Ecology) Lake Cyanobacteria Management Plan (LCMP) format, for Lacamas, Round and Fallen Leaf Lakes. The workplan is intended to specify the tasks required to understand the issues of algal blooms that have become common within the lakes. Nutrients within the lake have allowed algal blooms to become more common and longer in duration. These algal blooms cause harmful toxins to enter the waterbody resulting in a public health risk for the local community. Current management of the lakes is very limited and is based on an incomplete understanding of the causes of the blooms. As such, mitigation and prevention of these blooms are difficult unless a full understanding of the nutrient cycles within the lake can be developed, and external loading sources can be identified and determined. Identifying the phosphorus budget and inputs into the watershed are key to understanding and developing a comprehensive management plan for the watershed. This workplan outlines the steps towards development of such a plan.

Phase 2 can be separated into the following distinct parts:

- Phase 2a. QAPP development, to be completed via separate scope of work and agreement amendment. This work is complete.
- Phase 2b, Part 1: Conduct Field Work, to be developed based on the completed and approved QAPP. This work is ongoing.
- Phase 2b, Part 2: Task 2.2 (Part 2), Task 2.3, Task 2.4, and Task 2.9 (Part 2). This work is mostly complete, with limited budget remaining for Tasks 2.3 and 2.4.
- Phase 2b, Part 3: Task 2.2 (Part 3), Task 2.5, Task 2.6, Task 2.7, Task 2.8, and Task 2.9 (Part 3). These tasks are part of the current funding request.

Task 2A: QAPP Development

Previously approved and work is complete.

Task 2.1: Conduct Field Work

Previously approved and work is ongoing.

Task 2.2 Stakeholder Involvement

Objective

The objective of this task is to conduct education and outreach with the community to generate continued awareness of the LCMP effort, collaborate with and inform key stakeholders and the broader community about the current lake conditions and potential management measures for short and long-term improvement and build consensus and support for sustainable and effective long-term management measures to improve lake water quality.

This task will focus on these three elements of engagement:

1. **Ongoing information and awareness campaign:** The project team will continue general communication with the broader community which will include maintaining the project webpage on Engage Camas, continued social media content and updating the project fact sheet. In addition, the project team will develop an informational "call to action" campaign to generate awareness of short-term management measures to improve water quality in the lakes, such as responsible pet waste practices, alternative fertilizers, etc. This campaign could include collateral materials, such as stickers, posters, mailers, flyers and an informational video.
2. **Engage the public, key stakeholder groups and other partners to guide development of effective and sustainable long-term management measures to improve water quality in the lakes:** The project team will work with the City to develop and launch a series of three online open houses to guide the development of effective long-term management measures for the lakes informed by community goals and values. the online

open houses will be designed to keep the community apprised of project progress with the field data program, the spectrum of lake management measures available, and be part of vetting and prioritizing appropriate lake management measures that will be acceptable to the community while improving lake water quality.

3. **Development of a community supported, long-term lake management recommended alternative:** In order to develop a lake management alternative (suite of management measures) that is supported by key stakeholders and the broader community, the project team will engage key stakeholder groups. These key stakeholders will include large property owners, state and local agencies, lake user groups, Camas Parks and Recreation Commission, City Council, the Lacamas Creek Watershed Advisory Committee and the broader community. Outreach and engagement will include small group meetings with key stakeholders, online surveys and online open houses to provide input on community goals, values and expectations for a long-term management alternative, these efforts will also provide an opportunity to learn about and provide input on the spectrum of lake management measures.

Activities

Activities within this task will take place in phases in the following phases:

Phase 2.2, Part 2 portion:

- A public involvement kickoff meeting to be held between the Geosyntec team and the City to inform development of the public involvement and communications plan
- Develop the public involvement and communications plan to include key messaging, awareness campaign strategies and outreach to target audiences
- Strategize with the City about how best to reach out to and maintain communication with key project stakeholders, including local and state agencies, large landowners, Camas School District, Camas Parks and Recreation Commission, City Council and lake user groups.
- Continue to update the City's Engage Camas page
- Continue to develop social media content
- Develop up to one community-wide mailer
- Develop up to one collateral material (sticker or poster)
- Host up to two informational tabling events at high traffic locations in the community
- Develop informational video describing the LMP, timeline and identified long and short-term management measures to improve water quality

- Conduct an online open house to share project progress with the field data program as well as ask questions to better understand the community values and expectations for future lake use and management measures.
- Conduct 2 meetings with key stakeholder groups, to be identified in collaboration with the City

Phase 2.2, Part 3 portion:

- Conduct an online community open house to share the spectrum of lake management measures and gather input on possible management measures for the future
- Conduct an online community open house to vet and prioritize appropriate lake management measures
- Continue to update the City's Engage Camas page for the LCMP
- Continue to develop social media content
- Develop up to one community-wide mailer
- Host up to two informational tabling events at high traffic locations in the community, including the October 1, 2022 Lake Clean-up Day
- Conduct 2 meetings with key stakeholder groups, to be identified in collaboration with the City

Deliverables

- Agenda and summary of action items from kick off meeting
- Public Involvement and Communications Plan
- Updated fact sheet (1)
- Design for collateral materials (1 sticker and 1 poster for awareness campaign)
- Development and summarizing up to three online open houses
- Coordination, attendance and summary of up to 4 tabling events
- Development of 1 mailer for distribution throughout the community
- Content for up to 12 social media posts
- Production of 1 informational video
- Up to 6 updates to the Engage Camas web page
- Agendas, discussion questions and summary report of meetings with up to 2 key stakeholder groups or individuals.

Assumptions

- The public involvement plan will undergo one round of review before being finalized

- Recognizing that the current pandemic is a constantly changing situation, the Geosyntec team will work closely with the City to determine the best methods to engage people whether that's online or through safely distanced in-person engagement

Task 2.3 Implement Short-Term Wins and Volunteer Opportunities (Previously authorized)

Objective

The objective of this task is to assist the City with implementing short-term win ideas prioritized in Phase 1.

Background

During Phase 1, we identified the following short-term wins as the most promising opportunities:

- Collaborate with Clark Conservation District on their workshop programs on watershed processes and water quality issues, and BMP technical assistance to landowners
- Optimization of stormwater operations, including checking catch basin cartridge units
- Evaluate opportunities related to the PROS plan as it is developed, in collaboration with the Camas Parks department. Opportunities may include prioritizing vegetation that exports less Phosphorus, and contributing to updated design standards and maintenance standards for trails to prevent erosion.
- Hotspot erosion control at:
  - East Lake boat ramp
  - Round Lake Parking lot (County owned)
- Screening of properties recently purchased as part of the legacy lands program. We recommend focusing on the Rose and Leadbetter properties.

Activities

- Participate in up to four (2) meetings with Clark Conservation District
- Participate in up to four (2) meetings with the City of Camas, Parks Department
- Conduct two (2) days of field work along with the City to assist with any of the potential following items:
  - Checking catch basin cartridge units,
  - Visiting the East Lake boat ramp for scoping erosion control opportunities,
  - Visiting the Round Lake Overflow Parking Lot for scoping erosion control opportunities, or

- Screening level assessment of recently purchased properties current erosion state, and opportunities for on the ground restoration or BMP demonstration projects (Rose and Leadbetter properties),

Deliverables

- Meeting agendas and summary notes from the meetings with Clark Conservation District and the Parks Department
- Summary notes from the field activities
- Technical memo suggesting tactics to optimize stormwater operations potentially including construction erosion control inspections, ongoing facility inspection and maintenance, catch basin cleaning frequency and street sweeping.
- Technical memo outlining short term corrective actions to abate erosion.
- Technical memo regarding legacy lands, providing corrective actions to abate active erosion, and an opportunities matrix for potential restoration activities.
- Summaries of work performed

Assumptions

- Field work will be performed by 2 members of the Geosyntec team along with at least 1 City employee
- Additional field work required to complete these tasks is not part of this scope of work
- Existing fieldwork protocols can be used to evaluate recently purchased properties
- The City is able to provide complete information regarding how the stormwater program currently operates

Task 2.4 Funding Strategy and Implementation (Previously authorized)

Objective

The objective of this task is to utilize the funding strategies identified in Phase 1 to assist the City in applying for grant applications and collaborating with other agencies to pursue joint funding.

Activities

- Conduct a funding strategy Phase 2 kickoff meeting to discuss this approach. This will include discussion of developing inter-agency partnerships to pursue joint funding or develop joint programs for project funding and implementation. Partnerships may include:
  - Clark Conservation District
  - Clark County

- Washington State Department of Ecology
- U.S. Department of Agriculture Natural Resources Conservation Service

- Provide limited support for the City in completing up to grant applications identified in Phase 1 (assume 18 hours of consultant time)
- Being able to identify and implement the most effective and sustainable LCMP for improving the lakes will require collaboration with other agencies and community partners. Therefore, the Geosyntec team will provide limited support, assisting the City in collaborating with local and state agencies to identify opportunities and develop long term partnerships for ongoing coordinated lake management and implementation of the Lake Management Plan (assume 24 hours of consultant time).

Deliverables

- Meeting agendas and summary notes from funding strategy session

Assumptions

- This task includes up to 50 total hours of consultant time from the Geosyntec team

Task 2.5 Field Data Analysis

Objective

The objective of this task is to analyze the field data coming in over the 12-month period to characterize the lake water quality conditions and support development of the LCMP.

Activities

- Analyze the field data and develop appropriate plots and tables and other information summarizing the data and what it tells about lake water quality conditions. This analysis includes:
- Lake inflows, outflows and lake level
- In-lake Temperature, Dissolved Oxygen, pH, Conductivity, and Secchi Depth
- In-lake Phosphorus (Total and Orthophosphate), Nitrogen (Ammonium, Nitrate-Nitrite, and Total Persulfate N), Chlorophyll-a
- Concentration of Phosphorus (Total and Orthophosphate), Temperature, Dissolved Oxygen, Nitrogen (Ammonium, Nitrate-Nitrite, and Total Persulfate N), pH and Conductivity in the tributaries
- Waterfowl (qualitative)
- Aquatic vegetation
- Shoreline modification

- Lake sediment sampling, including analysis of core samples for Total Phosphorus, Phosphorus fractionation, Iron, Aluminum, Percent Water, Grain Size
- Document the results and findings in a chapter of the LCMP

Deliverables

- A chapter in the LCMP focused on the monitoring results and interpretation

Assumptions

- Completion of this Task is dependent upon an approved QAPP and field workplan and contract for collecting data being executed
- Depending on the results of the Ecology bacteria field sampling and the field sampling conducted under Task 2.4, there may be a need for conducting microbial source tracking, which would provide valuable information on bacteria sources to the lakes. Currently this is not scoped in this workplan

Task 2.6 Develop and Analyze Hydrologic and Nutrient Budget

Objective

The objective of this task is to develop quantitative budgets for water, phosphorus, and nitrogen.

Activities

- Acquire field data from other agencies such as USGS, WA Department of Ecology and others to support develop water and nutrient budgets
- Develop monthly and annual flow budget for each lake using table sand graphics, as needed
- Develop monthly and annual nutrient (total phosphorous, ortho-phosphorous, total nitrogen and nitrate-nitrate) budgets for each lake using table sand graphics, as needed
- Analyze monthly and annual loading from each of the sources, including potential internal loading, and outflows with data or other information
- Develop an analytical model of the Phosphorus balance in Lacamas/Round Lakes, using a method such as the Vollenweider (1968) model or similar, as a simple tool for predicting response to changes in loading or flow rates
- Calibrate the model by adjusting the rate coefficients to better match measured in-lake Phosphorus data
- Document the results and findings in a chapter of the LCMP

Deliverables

- A chapter in the LCMP focused on hydrologic budget, and a separate chapter on the nutrient budgets

Assumptions

- Completion of this Task is dependent upon an approved QAPP and field workplan and contract for collecting data being executed.
- This task is dependent on successful completion of the field effort

Task 2.7 Identify Management Methods for Cyanobacterial Control and Lake Restoration Planning

Objective

The objective of this task is to develop a recommended lake management plan with actionable steps, to significantly reduce algal blooms and improve overall water quality in Lacamas, Round, and Fallen Leaf Lakes, through lake and watershed management strategies.

Activities

- Develop criteria by which to measure the success of restoration and management activities
- Conduct a workshop with City staff and consultants working on the Stormwater Management Action Planning (SMAP) efforts so that stormwater-related data from the Lake Management Plan field efforts and relevant GIS data from the SMAP process are shared between the teams.
- Based on past experience and other LCMPs in WA and OR, develop a list of management measures that could be utilized to address water quality issues in the watershed and lakes. These may include at minimum: dam operations, sediment management, stormwater load reductions, agricultural best management practices, lake treatments, City ordinance changes and more
- Create a management measures matrix to evaluate and rank various measures based on factors such as cost, cost-effectiveness, sustainability, timeline to implement, funding needed, integration with City's existing goals, disruption to recreational uses and other factors
- Develop a list of potential alternatives (groups of management measures). Each alternative will contain combinations of in-lake techniques and best management practices (BMPs) at both the lake and in the watershed to control bioavailable phosphorus

- Evaluate alternatives concerning the criteria using the nutrient budgets, analytical model, lake history, and conceptual site model developed in Phase 1
- Conduct a series of workshops with the stakeholder working group, and the public at large, from Task 2.2 above to walk through the following:
    - Public Workshop 1
        - Review the past data and current data
        - Review the conceptual site model for the lakes based on the new data
            - Any differences with past conceptual model?
            - What does current conceptual model, water and nutrient budgets, data analysis tells us about the lake?
            - What do we know about sources and sinks to the lake?
    - Public Workshop 2
        - Review the universe of lake management strategies developed above, and describe and define each one of them
        - Based on the results from Phase 1 and Task 2.2 above develop a list of factors the community thinks are important to the long-term improvement of lake water quality
    - Workshop 3
        - Review the lake management measures matrix, including the factors the community thinks are important
        - Go through a charrette process or other format to gather feedback from the working group on how they would rank the various management measures.
- Output from the workshop process should be a prioritized list of management measures with City and community buy in that can be done in the short term (next 12 months) and over the longer term
- Based on the evaluation above, select a recommended alternative of management measures to pursue in the LCMP
- Develop a process for adaptive management to ensure continual improvement of lake quality
    - Measuring progress (e.g., projects on the ground, load reductions, improvements in the water quality of the lakes)
    - Deciding when to shift tactics if desired results are not achieved
    - Describe future monitoring and potential adaptive management activities that will support the recommended alternative
- Describe the funding and human resources required for the implementation of the recommended alternative

Deliverables

- A suite of community and City supported lake and watershed management measures for inclusion in the Lake Cyanobacteria Management Plan (Recommended Plan)

Assumptions

- Completion of this Task is dependent upon an approved QAPP and field workplan and contract for collecting data being executed
- The activities under this Task will be coordinated with the efforts under Task 2.2 to coordinate efforts with the stakeholder engagement and outreach and the working group to get appropriate engagement and community input for this task

Task 2.8 Develop Lake Management Plan (Lake Cyanobacteria Management Plan)

Objective

The objective of this task is to develop a complete LCMP that follows the Ecology Lake Cyanobacteria Management Plan template.

Activities

- Develop a detailed annotated LCMP outline
- Develop a draft LCMP for review by the City
- Develop PowerPoint slide decks and other material and present interim progress on the LCMP in three (3) stakeholder meetings
- Complete the draft LCMP for submission to Ecology
- Conduct potential conference call(s) with Ecology to seek additional guidance when developing the draft LCMP
- Receive and respond to comments from Ecology on the LCMP in coordination with the City.
- Conduct potential conference call(s) with Ecology to discuss feedback on the LCMP
- Develop and submit a final version to Ecology

Deliverables

- Draft and final versions of the LCMP

Assumptions

- Completion of this Task is dependent upon an approved QAPP and field workplan and contract for collecting data being executed.
- The draft LCMP will undergo one round of review with the City before being finalized for submission to Ecology
- The revised LCMP (addressing Ecology feedback will undergo one round of review with the City before being finalized for resubmission to Ecology
- There may be up to three (3) conference calls with Ecology to discuss the draft LCMP or discuss Ecology feedback on the LCMP

Task 2.9 Project Management and Progress Update Meetings

Objective

The objectives of this task are the attentive management of a project and ongoing communication with the City. This task is broken up into Task 2.9, Part 2, which covers the first 6 months, and Task 2.9, Part 3, which covers the subsequent work. Since the activities are the same for both parts, they are described here only once.

Activities

- Organize and lead a project team within to complete the tasks described below
- Maintain active communication with the City
- Convene meetings regularly, every three to four weeks, with the City and consultant team to report on:
  - Task progress
  - Problems encountered
  - Progress in reporting
- Manage the project, including scope, schedule and budget and subconsultant fees and expenses
- Prepare monthly invoices

Deliverables

- Presentations describing progress on the Tasks described below
- Monthly consolidated invoices submitted to the City
- Provide updated schedule of tasks

Assumptions

- Regular updates will be provided as agreed upon between the Geosyntec team and the City

BUDGET

Table 1 below provides the detailed cost estimate for **Phase 2b, Part 3 only**. The total fee for Phase 2b, Part 3, is $189,400, on a time and materials basis. This budget estimate includes a 3% communications fee on Geosyntec labor only and a 10% markup on subconsultant labor and any expenses.

Task	Description	Total Cost
2A	QAPP Development	Approved
2.1	Field Work	Approved
2.2, Part 2	Stakeholder Involvement, First 6 months	Approved
2.2, Part 3	Stakeholder Involvement, Subsequent	**$47,100**
2.3	Implement Short-Term Wins	Approved
2.4	Funding Strategy and Implementation	Approved
2.5	Field Data Analysis	**$19,800**
2.6	Develop and Analyze Hydrologic and Nutrient Budget	**$23,700**
2.7	Identify Management Strategies	**$27,300**
2.8	Develop LCMP (Lake Cyanobacteria Management Plan)	**$43,200**
2.9, Part 2	Project Management, Next 6 months	Approved
2.9, Part 3	Project Management, Subsequent	**$25,100**
	Total, Phase 2b, Part 3	**$186,200**
	Communications Fee, 3% (on Geosyntec labor only)	**$3,300**
	Total, Phase 2b, Part 3, including Communications Fee	**$189,500**

FULL CONTRACT PROJECT COST SUMMARY

For reference, Table 2 below, provides a total Project Cost Summary by Phase (i.e., contract amendment) for the life of the Professional Services Agreement.

Contract Amendment	Date	Phase and Description	Total Cost
Original Contract	June 8, 2021	Phase 1 – Background and LMP Scoping	$107,400
Amend No. 1	Oct 5, 2021	Phase 2A – QAPP	$22,700
Amend No. 2	Nov 15, 2021	Phase 2b, Part 2 – Public Outreach and begin LMP development	$127,500
Amend No. 3	May 16, 2022	Phase 2 – Field Work	$294,800
Amend No. 4	In-Process	Phase 2b, Part 3 – Analyze Field Data and Complete LMP	$189,500
		Total Contract Cost	**$741,900**

CLOSURE

If you have any questions regarding our draft scope of work for Phase 2b, Part 3, please feel free to contact us at (971) 271-5906/(503) 936-0115, or by email at Jkrall@gosyntec.com, or RAnnear@geosyntec.com.

Thank you for the opportunity to submit this draft scope of work for your consideration.

Respectfully,

Jacob Krall, Ph.D., P.E.(OR, CA)
Project Engineer
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Geosyntec Consultants

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Senior Principal Engineer
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Geosyntec Consultants

APPENDIX: LAKE CYANOBACTERIA MANAGEMENT PLAN OUTLINE

Title Page with Approvals

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Staff Report

October 3, 2022 Council Workshop Meeting

City Hall Annex Design Professional Services Agreement
Presenter: Steve Wall, Public Works Director
Time Estimate: 10 minutes

Phone	Email
360.817.7899	swall@cityofcamas.us

BACKGROUND: The City purchased the old Bank of America building located at the southwest corner of 4th Avenue and Everett Street for approximately $1.6 million in late 2018. The building is now commonly referred to as the "City Hall Annex".

The City hired LSW Architects in 2019 to assist in determining the optimal use for the building from a staffing and overall space planning perspective. After coordinating with the various departments that use City Hall, it was determined at the time to remodel the building and use it as a "Permit Center". The vision was to move Community Development staff and potentially the Fire Marshal's office employees to the Annex, as a single location for residents and businesses to go for common permitting needs.

Upon determination of the future use, the City continued working with LSW to design the remodel improvements and prepare drawings and specifications for bidding purposes. LSW was nearing completion of the design and the City was getting ready to bid the project when the COVID pandemic started and the project was placed on hold indefinitely.

Coming out of the pandemic, use of the City Hall Annex building was revisited. With the space constraints at City Hall, IT Department use of the building over the last couple years, realization that COVID and remote work reshaped the office needs, and a different overall perspective from the 2019 process, staff entered into a small contract ($6,500 maximum) with Johansson Wing Architects (JWA) from Battle Ground, WA in June 2022 to help rethink the use of available space in the building.

SUMMARY: Working with JWA and the management team, the attached Programming Space Diagram was developed to confirm the overall intent and use of the building given the current needs. From the Programming Space Diagram, the attached Preferred Concept was used to develop the attached City Hall Annex Scope of Work and Fee Proposal. The intent of the scope of work is to design improvements necessary to permanently house the IT Department on the west side of the building and create flexible conference room, office and desk spaces on the east side of the building that will provide room for the City's growing staff. Beyond the IT Department, there is no other specific use or employee group that is envisioned to move to the Annex Building when completed. With the east side available as flex space, as City staff continues to grow, there will be opportunities to move staff based on future needs.

As identified in the Fee Proposal, it is anticipated the design will include the following major remodeling efforts:

- Interior walls, windows and floorings in accordance with the Preferred Concept, including ceilings and wall finishings.
- Replacement of exterior "storefront" windows and doors as necessary to make the building weather tight. The existing windows along 4th Avenue have lost their seal and are causing moisture issues inside the building.
- Replacement of the gutters, membrane roof, and weather sealing of the larger cracks and mortar on the exterior walls.
- Rerouting of HVAC ductwork and installation of new HVAC units to service the new building layout.
- Mechanical, plumbing and electrical to service the new layout. Additionally, design of low voltage systems will be completed in coordination with IT Staff. Audio/Visual equipment is anticipated to be purchased at a later date.
- The only work anticipated in the basement is replacement of bathroom fixtures, plumbing and lighting to provide another option for restroom facilities and deep cleaning of the basement in general.

For reference, through the prior process it was identified that the floors, ceiling tiles, and insulation around the HVAC ducts included asbestos. The City will contract separately for asbestos abatement prior to, or in coordination with, the bidding process and contracted work.

EQUITY CONSIDERATIONS:

What are the desired results and outcomes for this agenda item?

Inform Council of the proposed scope of work for remodeling the City Hall Annex.

What's the data? What does the data tell us?

The City continues to grow, which results in the need for additional staff to support providing the necessary services. As a result of City Hall not being large enough to support the growing staff, use of the Annex will be necessary; presumably to help buy time for completion of a new City Hall.

How have communities been engaged? Are there opportunities to expand engagement?

N/A

Who will benefit from, or be burdened by this agenda item?

The City as a whole will benefit from this agenda item and remodeling the Annex building.

What are the strategies to mitigate any unintended consequences?

Discussion with Council prior to moving forward with the proposed Scope of Work.

Does this agenda item have a differential impact on underserved populations, people living with disabilities, and/or communities of color? Please provide available data to illustrate this impact.

No

Will this agenda item improve ADA accessibilities for people with disabilities?

Yes. The entrance to the building and the existing restrooms will all be improved with the remodel project.

What potential hurdles exists in implementing this proposal (include both operational and political)?

The cost of the remodel could be a potential hurdle. Please see the Budget Impact section below for additional information.

How will you ensure accountabilities, communicate, and evaluate results?

Staff will keep the City Council informed of the progress and expenses associated with the project.

How does this item support a comprehensive plan goal, policy or other adopted resolution?

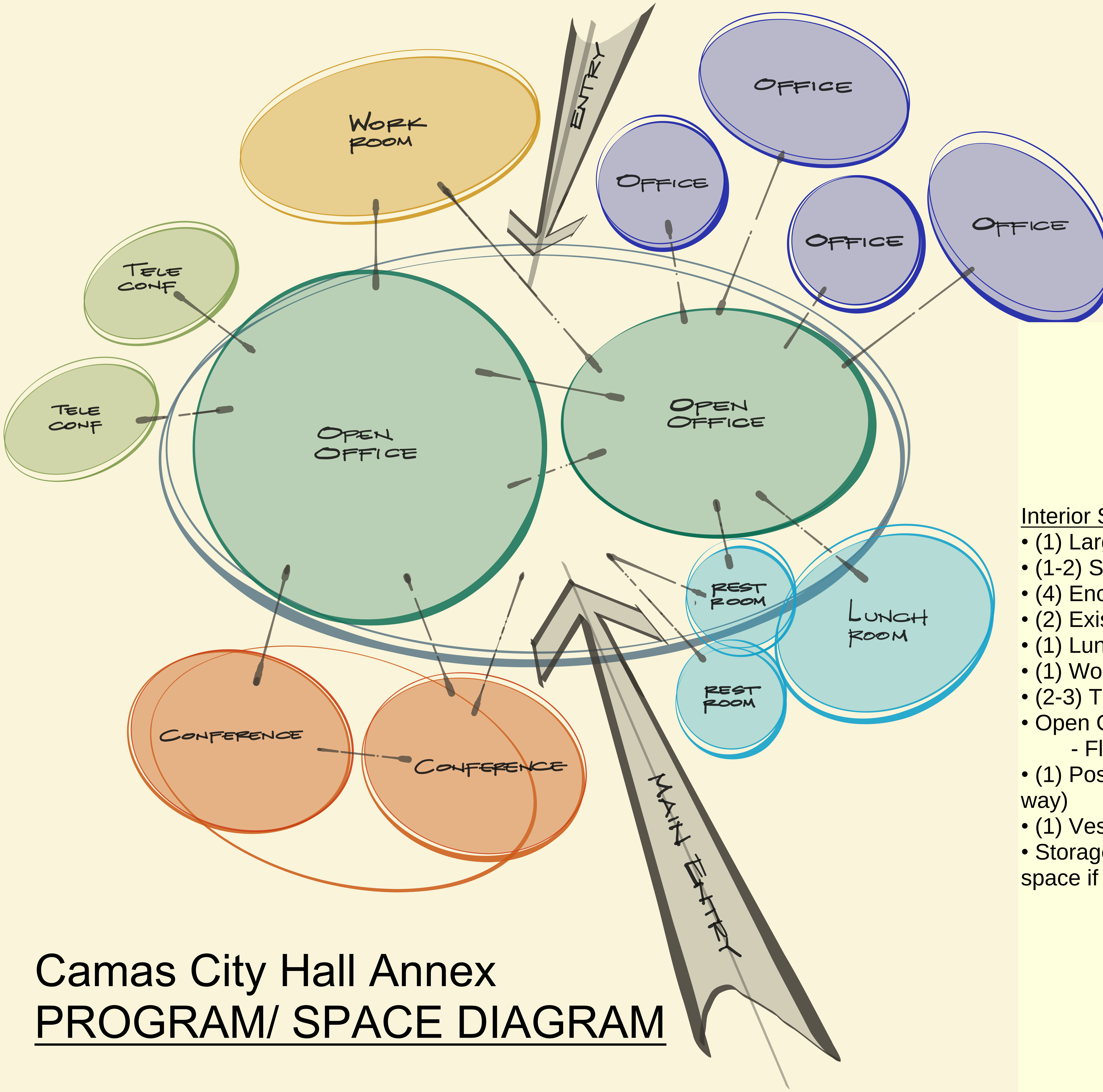
This item supports growth of the City in general, which is planned for and identified in multiple locations of the City's Comprehensive Plan.

BUDGET IMPACT: The Scope of Work and Fee Proposal from JWA for design of the remodel includes a not to exceed fee of $145,610. As identified in the proposal, work will be completed in phases and will require City staff authorization to proceed to the next phase. There are currently funds available in the 2021/2022 adopted Budget to support this work.

JWA is currently estimating the Construction Cost of the remodeling project to be in the range of $275/square foot. However, that figure does not include such things as the asbestos abatement, purchase of audio/video equipment, furnishings, permits, or change orders. With approximately 4,700 square feet on the main floor, based on today's dollars, and including a 35% contingency for items mentioned above, the current estimate for the total project cost could be in the range of $1.8 million to $2.0 million. However, this figure is based on many assumptions and staff will keep Council updated on the cost estimates as design progresses.

For Council's information, based on a search of expense records back to 2019, it appears the City has previously spent approximately $120,000 working with LSW as described in the Background Section above, and working with other various contractors and consultants on miscellaneous work associated with the building. Of those funds, staff and JWA will be able to use the reports and analyses completed on such things as the "building envelope" (condition of the exterior of the building, including the roof), asbestos abatement needs, and HVAC and plumbing needs. Similarly, the mechanical engineer working for JWA is the same mechanical engineer that was a sub-consultant for LSW in 2019 and we expect to see some efficiencies in their design efforts.

RECOMMENDATION: This item is for Council's information only. Staff recommends placing the professional services agreement on the October 17th Regular Meeting Consent Agenda for consideration.



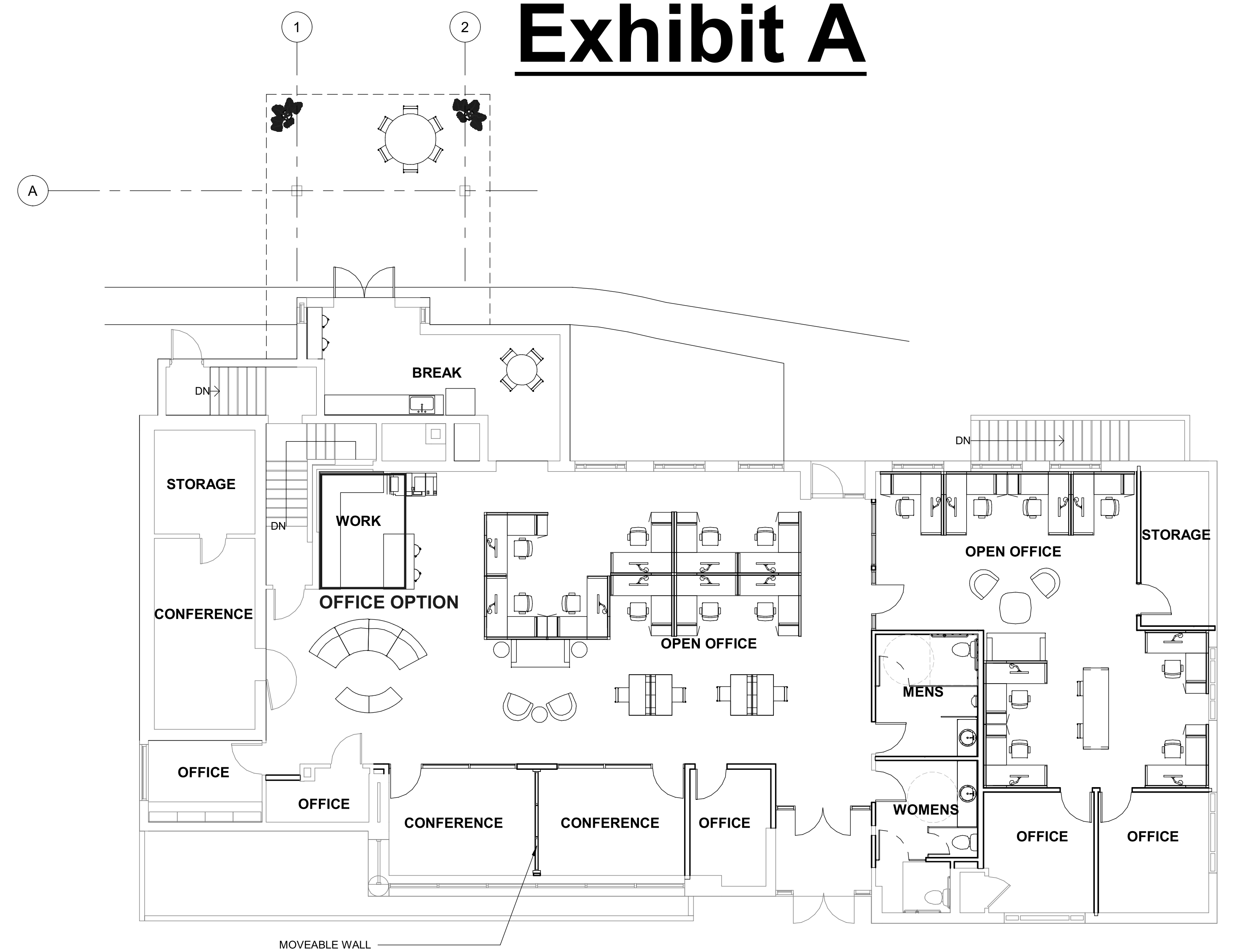
Interior Spaces Identified:
- (1) Large Conference room (10-20 people)
- (1-2) Small Conference rooms (4-6 people)
- (4) Enclosed Offices
- (2) Existing Restrooms (New Fixt /Fins as needed)
- (1) Lunchroom (Possibly keep in existing location)
- (1) Work room
- (2-3) Tele-conference spaces of various sizes
- Open Office space (Unknown workstation quantity)
  - Flex Space
- (1) Possible Reception (An area that can be used this way)
- (1) Vestibule/ Entry
- Storage in existing Vault. (Could be used as meeting space if safety deposit boxes are removed.

Camas City Hall Annex
PROGRAM/ SPACE DIAGRAM

DIAGRAM INDICATING THE BASIC SPACE & FUNCTIONS AND THEIR CONNECTIONS TO ADJACENT SPACES.
THE DIAGRAM DOES NOT REPRESENT SPACE OR ROOM ORIENTATION.

Item 6.

Exhibit A



1 PRELIMINARY FLOOR PLAN

1/8" = 1'-0"

GENERAL TENANT IMPROVEMENT REMODEL SCOPE:

1. DEMOLITION OF INTERIOR PARTITIONS WITHIN OPEN OFFICE AREAS.
2. REMOVAL OF EXISTING APPLIED CEILING PANELS (ABATEMENT BY OTHERS) TO BE REPLACED WITH NEW SUSPENDED ACOUSTIC CEILING TILE/ GRID SYSTEM.
3. DEMOLITON OF ALL EXISTING ITEMS THAT ARE UNUSED IN THE REMODEL.
4. NEW WALL AND FLOOR FINISHES.
5. NEW INTERIOR PARTITIONS FOR NEW ROOM CONSTRUCTION.
6. NEW & REMODELED RESTROOMS.
7. INTERIOR DOOR & HARDWARE REPLACEMENT.
8. ALL EXTERIOR DOORS, WINDOWS & STOREFRONT TO BE REPLACED.
9. HVAC MODIFICATIONS TO EXISTING SYSTEMS TO ACCOMMODATE NEW SPACES.
10. NEW LIGHTING THROUGHOUT.
11. NEW ELECTRICAL POWER LAYOUT THROUGHOUT REMODELED SPACES INCLUDING FLOOR BOX POWER DISTRIBUTION TO ACCOMMODATE NEW SYSTEMS FURNITURE.
12. DATA/ TECHNOLOGY UGRADES.
13. NEW ROOFING AND DRAINAGE SYSTEMS.
14. NEW ROOF FLASHINGS AS NECESSARY.
15. MINMAL PATCH & REPAIR OF EXISTING DAMAGED BRICK.
16. MINIMAL EXTERIOR SEALING AT FAILING LOCATIONS.
17. FRONT ENTRY WALKWAY REWORK FOR NEW STORM DRAINAGE SYSTEM.
18. SITE DOESTIC WATER AND SANITARY SEWER PIPING REPLACEMENT

9/14/2022 3:47:43 PM

JW Johansson Wing Architects
821 SE 14th Loop, Suite 109
PO Box 798
Battle Ground, WA 98604
Ph: 360-687-8379
www.johanssonwing.com

NOT FOR CONSTRUCTION

CAMAS CITY HALL
ANNEX
CAMAS, WA

PRELIMINARY FLOOR PLAN

PROJECT #	22006
DATE	08/10/2022

REV #	DATE	DESCRIPTION

A201

PRELIMINARY

DRA T

Johansson Wing Architects
821 SE 14th Loop, Suite 109
PO Box 798
Battle Ground, WA 98604
Ph: 360-687-8379

Fee Proposal

Date: September 26, 2022

To: Steven R. Wall
Public Works Director
City of Camas Public Works Department
616 NE 4th Avenue
Camas, WA 98607

From: Lauren Johnson, AIA
Johansson Wing Architects

Subject: Fee Proposal
Camas City Hall Annex Tenant Improvement Remodel
Johansson Wing Architects Project # 22006

Mr. Wall,
Thank you for the opportunity for Johansson Wing Architects (JWA) to work with you on the **Camas City Hall Annex** Tenant Improvement Remodel project.

PROJECT UNDERSTANDING:
The project consists of approximately 4,700 SF renovation work in the existing former Bank of America building, based on the Pre-Design process and the concept design developed. Building upon the pre-design concept (as attached); renovation will include reconfiguring of the office areas to accommodate the following:

1. Open General/ Flex Office layout with several adjacent individual rooms and/ or spaces for conference/ meeting use and several private offices for further design refinement during the Schematic Design Phase.

2. Adjacent secured office area dedicated to the I.T. Department. Area shall accommodate spaces and functions defined in the Pre-Design Concept Plan with several private offices and open office area and as further developed during the Schematic Design Phase.

Existing accessory and adjacent rooms that remain shall be remodeled to accommodate changes in their function as defined by the finalized program and design. Within these areas, the ceilings, wall finishes, and flooring finish materials will be replaced. Associated interior doors and windows shall be added. Existing entry vestibule and corridor will be partially opened up to the adjacent open office areas.

Mechanical/ Plumbing and Electrical systems and associated low voltage wireway infrastructure shall be modified and or replaced to accommodate the new design layout (reference attached MKE scope of services).

Exterior storefront/ windows, doors, hardware shall be replaced.

New membrane roofing, flashing systems and drainage appurtenances shall be provided to replace existing.

Minor exterior wall and veneer sealant as recommended by RDH report provide by Owner for reference.

Demolition as necessary for the new work.

Hazardous materials abatement shall be completed by separate Owner contract as referenced in the 3 Kings proposal dated March 30, 2020. (Reference attached Pre-Design Concept - Exhibit A).

BUDGET
Project Budget is in Owner development. We propose to use a consulting cost estimator to provide project construction cost estimating at strategic points along the project development for budget alignment. At this point it is assumed that the construction cost will be in the $275/ sf range. We shall provide opinions and recommendations to assist in the Owners Budgeting development and receive the Cost Estimators overview.

PROJECT ASSUMPTIONS:
The project team has made the following assumptions to develop the scope of services, limitations of scope, and associated fees for this project. See attached “Exhibit - A” Predesign Concept for basis of Design Scope.

General Assumptions:

- Assume one Design and Construction Document package that may include multiple construction phases.
- All Agency review and/or permit fees, etc. will be paid by the Owner.
- Existing Building Conditions Documentation is based upon Owner-provided existing conditions documentation and our limited field visual observations.
- Hazardous material abatement shall be completed by Owner’s separate abatement contract as provided by Owner for reference from 3 Kings Environmental, dated March 30, 2020.

SCOPE OF SERVICES:
Architectural – JWA
Provide basic Architectural services including overall project management and coordination of the design, permitting and construction documents for the entire project. Conduct meetings with the project team during design, and Owner/ Stakeholder meetings. Provide Construction Bidding assistance. Provide construction phase/ contract administration services during construction. Provide construction contract Closeout services.

Civil Engineering –
Front Entry exterior surface drainage improvements (new catch basin or trench drain at entry)
Provide new on-site domestic water and sanitary sewer laterals to replace existing. Extent shall be from the building to streetside meter/ box.

Assumptions:

- As the disturbed area is less than one acre, it is assumed that a Construction Stormwater General Permit from DOE is not required.
- Assumes that no Land Use Review process shall be required.

Structural Engineering – Not included
Structural Engineering services are not anticipated to be required and not provided. If this becomes necessary, these services will be added.

Mechanical, Electrical and Plumbing - MKE Associates
Reference attached MKE Proposal for JWA Consultant Contracting.

Furniture System – Hyphn or Other TBD
Furniture systems design, selection, procurement, and installation coordinated through the collaborative program, design, and furniture selection process with Owner.
Range of costs may be provided as quantities and furniture type are further developed. Design costs are planned to be included in the furniture systems contract

Cost Estimating – ROEN Associates
Services to be provided through an Independent Cost Estimating Consultant, include an evaluation of the Owner's budget for the Cost of the Work, advice to the owner regarding changes in general market conditions and project requirements, and subsequent detailed cost estimates based on the documents provided for Design Development and Construction Document phases. Services include one round of reconciliation of owner's and design team's comments for each phase.

SCHEDULE:
The following is a general overview of anticipated project schedule, and we will work with the City to finalize a project schedule.

The project is anticipated to roughly follow this schedule but shall be ultimately determined by the progress of the owner's process:

Schematic Design	Start in September
Design Development	December
Construction Documents	Complete in March
Permitting	Prior to Construction
Bidding	April
Construction Contract Administration	Start in May/ June
Project Closeout	Spring 2024

*****Note: The timeliness of agencies having jurisdiction reviews/approvals, and contractor bidding and construction are not controlled by the Architect and may vary.

COMPENSATION:
Basic Services are provided on a Time and Material Basis.
Estimated Costs are based on an assumed $250/sf Construction Cost.
Time and Material Fees and any necessary Additional Services shall be based on the attached Standard Fee Schedule "Exhibit – B"

Service	**Consultant**	**T&M Estimated Fee**
Architectural Design/ Contract Admin.	JWA	$83,050
Mechanical Engineering	MKE	$26,950
Electrical Engineering	MKE	$19,250
Basic Services	**Sub Total:**	**$129,000**
Civil Engineering	Robertson Engineering	$10,230
Furniture Systems	Hyphn or other	Design Fee in Furniture Package
Cost Estimating	ROEN	$6,380
Total Services	**Total:**	**$145,610**

Above fee amounts are estimates based on anticipated cost of construction and scope. Fees will be billed monthly on an hourly basis for time and materials expended.

Fee Expenditure Schedule

Below indicates the fee breakdown of design and documentation phases of the project and the corresponding fee percentage to be expended for the specific phase. Each phase includes a line for Owner approval to proceed with the phase of work.

				Owner initial for phase approval
Schematic Design	(*17%*)	=	$24,753.70	________
Design Dev. / Constr. Docs	(*58%*)	=	$84,453.80	________
Bidding	(*05%*)	=	$ 7,280.50	________
Construction Administration	(*20%*)	=	$29,122.00	________

If the scope of work above does not adequately reflect your expectations, please let us know. It is our goal to meet your needs for this project, and we look forward to working with you. If you agree with this proposal, please sign below and return one (1) copy to our office, and we will issue an AIA Standard Form of Agreement, or review Agreement provided by Owner.

Should you have any questions, or need further clarification, please do not hesitate to contact us.

Sincerely,

9/26/2022

Lauren Johnson, AIA — Date
Principal

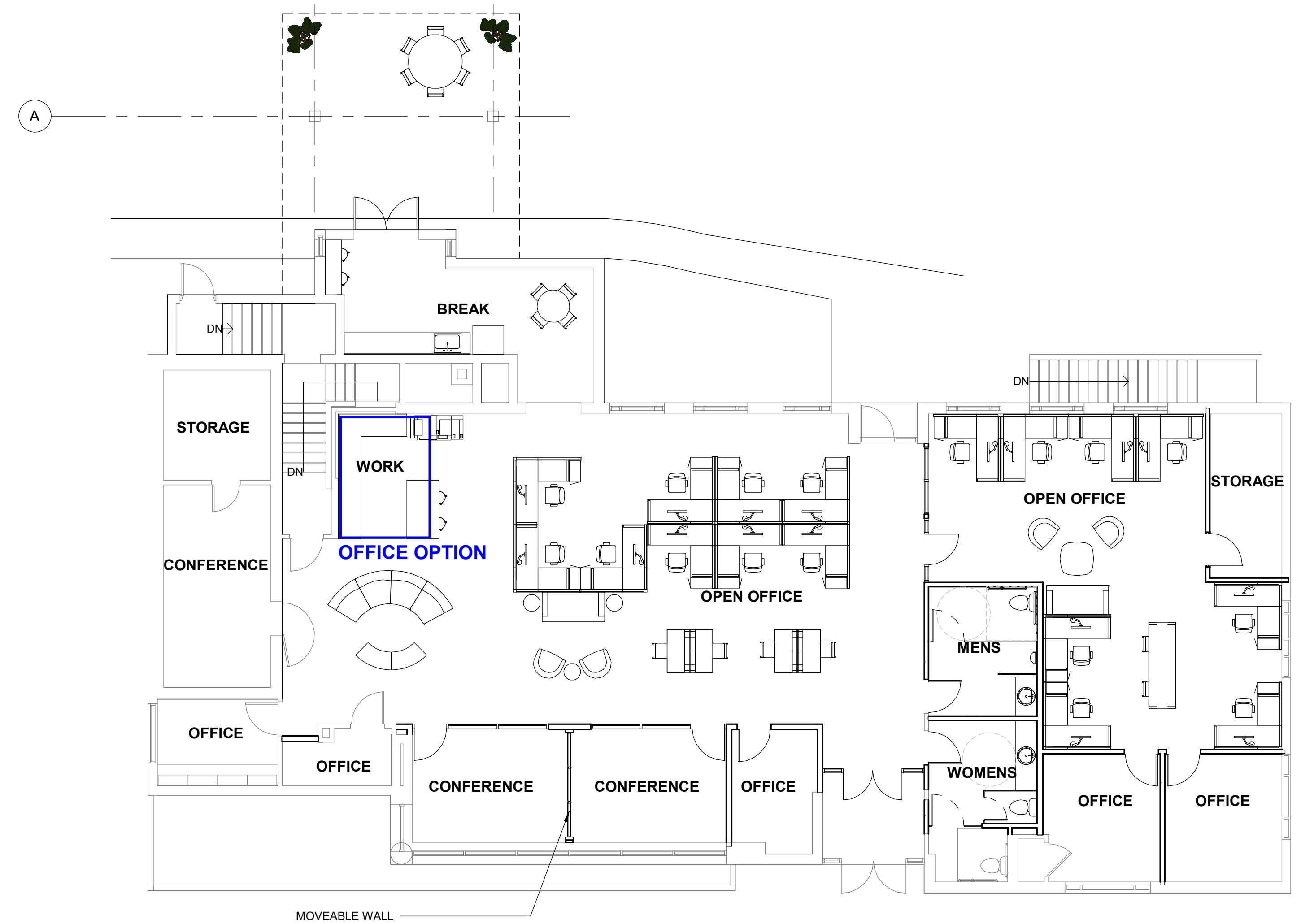
ACCEPTANCE OF PROPOSAL:
The undersigned has authority to sign for and hereby agrees to the fee proposal outlined above.

Signature — Date

Printed Name

Copy: Project File

Exhibit A



1 PRELIMINARY FLOOR PLAN

1/8" = 1'-0"

GENERAL TENANT IMPROVEMENT REMODEL SCOPE:

1. DEMOLITION OF INTERIOR PARTITIONS WITHIN OPEN OFFICE AREAS.
2. REMOVAL OF EXISTING APPLIED CEILING PANELS (ABATEMENT BY OTHERS) TO BE REPLACED WITH NEW SUSPENDED ACOUSTIC CEILING TILE/ GRID SYSTEM.
3. DEMOLITON OF ALL EXISTING ITEMS THAT ARE UNUSED IN THE REMODEL.
4. NEW WALL AND FLOOR FINISHES.
5. NEW INTERIOR PARTITIONS FOR NEW ROOM CONSTRUCTION.
6. NEW & REMODELED RESTROOMS.
7. INTERIOR DOOR & HARDWARE REPLACEMENT.
8. ALL EXTERIOR DOORS, WINDOWS & STOREFRONT TO BE REPLACED.
9. HVAC MODIFICATIONS TO EXISTING SYSTEMS TO ACCOMMODATE NEW SPACES.
10. NEW LIGHTING THROUGHOUT.
11. NEW ELECTRICAL POWER LAYOUT THROUGHOUT REMODELED SPACES INCLUDING FLOOR BOX POWER DISTRIBUTION TO ACCOMMODATE NEW SYSTEMS FURNITURE.
12. DATA/ TECHNOLOGY UGRADES.
13. NEW ROOFING AND DRAINAGE SYSTEMS.
14. NEW ROOF FLASHINGS AS NECESSARY.
15. MINMAL PATCH & REPAIR OF EXISTING DAMAGED BRICK.
16. MINIMAL EXTERIOR SEALING AT FAILING LOCATIONS.
17. FRONT ENTRY WALKWAY REWORK FOR NEW STORM DRAINAGE SYSTEM.
18. SITE DOESTIC WATER AND SANITARY SEWER PIPING REPLACEMENT

9/14/2022 3:47:43 PM

Johansson Wing Architects
821 SE 14th Loop, Suite 109
PO Box 798
Battle Ground, WA 98604
Ph: 360-687-8379
www.johanssonwing.com

NOT FOR CONSTRUCTION

CAMAS CITY HALL
ANNEX
CAMAS, WA

PRELIMINARY
FLOOR PLAN

PROJECT #	22006
DATE	08/10/2022

REV #	DATE	DESCRIPTION

PRELIMINARY

A201

DRAWING SHEET

Exhibit B

JOHANSSON WING ARCHITECTS, PC
2022 RATES AND REIMBURSABLES*

Rates:

Principal	$240.00 per hour
Associate	$220.00 per hour
Project Manager	$200.00 per hour
Architect	$180.00 per hour
Designer III	$160.00 per hour
Designer II	$140.00 per hour
Designer I	$120.00 per hour
Administrative Services	$100.00 per hour

Reimbursables:

Project Expenses	Cost + 10%
In-House Plots	$2.50 per sheet
In-House Prints – Color	$0.30 per sheet
In-House Prints – B&W	$0.15 per sheet
Mileage	Current IRS Reimbursable rate

**Rates subject to change*

Johansson Wing Architects, PC
821 SE 14th Loop, Suite 109
PO Box 798
Battle Ground, WA 98604
Ph: 360-687-8379
www.johanssonwing.com

Exhibit C

MKE & ASSOCIATES, INC.
CONSULTING ENGINEERS

September 13, 2022

VIA e-mail: lauren@johanssonwing.com

Lauren Johnson
Johansson Wing Architects

SUBJECT: **City of Camas – Bank of America Tenant Improvement**
Engineering Design Fees – **Revision 1**

Lauren,

Thank you for requesting a fee proposal to assist with the subject project located at 528 NE 4th Ave, Camas, WA 98607. As you mentioned, MKE has prior history with this site having conducted a building assessment and produced TI documents to a Design Development level under prior contracts. As such, we are very familiar with the site. Below is our understanding of the project scope, assumptions, exclusions and fee summary. The items below are written around the understanding that the lower-level portion of the building is not included in the TI effort and will essentially remain as is with the exception of selected equipment in the main Mechanical / Electrical room and upgrades necessary to support updating of the MEP systems.

Scope of Work

General:

- Site visit only as necessary. MKE has been to the site several times so initial visits to confirm existing conditions may not be necessary.
- Attend up to six (6) design meetings via web meeting tool to discuss mechanical and electrical system options and associated costs.
- General design coordination to be conducted via phone and email.
- Provide catalog cuts for proposed equipment.
- Conduct code reviews and contact local authorities as required.
- Submit documents at 100% SD, 100% DD, 50% CD and 100% CD for design review.
- Submit documents for Permit / Construction.
- Provide bid and construction period services including responding to contractor questions, substitution request and submittal review and two (2) site visits with observation reports.
- Fill out Washington State Energy Code Forms for Lighting.
- Fill out Washington State Mechanical Code Forms.

Mechanical:

- No HVAC & Plumbing work is anticipated in the basement. Work is only involved with above grade waste connection at Basement ceiling for drinking fountain above, **and men's and women's restroom on the 1st floor.**
- Provide plumbing design to connect one (1) drinking fountain on first floor.
- **Provide plumbing design for men's and women's restroom on the 1st floor per new layout. Existing plumbing system (waste and cold water) assumed to have enough capacity for reuse.**

Continued, next page. . .

Mechanical: (continued)

- **Replace existing fixtures with new alike plumbing fixtures (WC and Lavs) in two (2) existing restrooms in the basement. Rework existing plumbing piping to these fixtures for waste, cold water, and hot water reconnection.**
- **Provide plumbing design for new sink in Breakroom. Coordinate sanitary waste point of connection with Civil.**
- **Three (3)** single zone ductless split system for heating/cooling and ERV for ventilation to serve **two (2) conference rooms and one (1) office located along the west exterior wall.**
- **Provide one (1) single zone ductless split system for heating/cooling and ERV for ventilation to serve new conference room (previously a vault). Architect to coordinate and provide necessary penetration through vault wall and ceiling for running duct work.**
- It is assumed that the **new breakroom,** and existing spaces between grid D&E and 1&2, are becoming offices and will be served by existing split system. No new HVAC system is required.
- Drop ceiling will be provided under the existing ceiling structure for the entire 1st floor to allow ductwork extension to new supply diffusers, and return grilles at new suspended ceiling.
- Existing supply air diffuser and return air grilles will be retained and reused as much as possible. New diffuser / grilles will be provided as needed. Rearrange ductwork and diffuser to fit new room and ceiling layout.
- Architect to provide adequate and accessible space for all mechanical equipment. Architect will provide adequate ceiling space under existing ceiling / roof assembly to run ductwork extension to ceiling diffusers.

Electrical:

- Design replacement of existing electrical service.
- Design power distribution (interior, exterior, normal, and emergency).
- Design interior lighting **(1st floor all new, basement floor approximately 50% replacement)**, including electrical distribution, controls, and circuiting.
- Design egress lighting as required by code. Emergency power via integral battery drivers or remote inverter unit(s).
- **Design electrical connections for mechanical and plumbing equipment.**
- Provide performance specification for new fire alarm system.
- Design raceway infrastructure for voice and data communications, A/V and Security systems. **Owner to provide MKE with locations of data/telecom outlets to be shown on the drawings for reference.**

Assumptions:

- MEP Drawing will be produced in AutoCAD.
- The project is designed and constructed as a single phase.
- No sprinkler work is anticipated.
- There is no change in occupancy – Group B for bank application and new office application.
- Existing building envelope to remain. No alterations are anticipated. Exterior doors and windows / storefront to be replaced with new.
- Building assumed to be under the alternation category and no extra energy efficiency credits are required per energy code.
- Electrical service will be replaced. Some existing branch circuit panels will be re-used.
- All existing mechanical equipment is to remain and is adequately sized to serve new open office spaces.
- MKE will draft contractor markups to create record drawings.
- Additional site visits will be billed on a Time & Materials basis.

Continued, next page. . .

Assumptions: (continued)

- **Asbestos abatement is by others. Jobsite area is presumed to be free of asbestos prior to construction beginning.**

Exclusions:

- Project structural engineer will review submittals of support and seismic restraint attachments to building structure as part of their fee.
- **Specifications for telecom/data rack, patch panels, and horizontal cabling and termination.**
- Head-end and peripheral equipment including but not limited to servers, switches, routers, UPS equipment, laptops, projectors (and mounts), Audio/Visual system design, voice enhancement and sound systems are by others.
- **Design for a Distributed Antenna System to support Emergency Responder Radio coverage.**
- Photovoltaic power generation design.
- Security and A/V design.
- ELCCA or LEED design services.
- Cost estimating is by others.
- Commissioning support.
- Detailed HVAC load calculation.
- Revisions in direction, including VE items, after DD will be considered extra services.
- Bid alternates are excluded.

Fee

For the services above, MKE respectfully requests the following fee:

	Mechanical	Electrical	
Schematic Design:	$1,500	$1,100	
Design Development:	$5,500	$3,900	
Construction Documents:	$13,000	$8,500	
Bid:	$1,000	1,000	
Construction Administration:	$2,600	$2,100	
Record Drawings:	$900	$900	
Total:	**$24,500**	**$17,500**	
		Grand Total:	**$42,000**

This proposal is valid for 45 days. Invoices for services will be submitted on a monthly basis. Payments due which exceed 90 days from date of invoice may be subject to a monthly charge of 1.5% of the unpaid balance (18% annual).

Changes to the design after work has substantially started will be considered extra services and billed on an hourly basis in addition to the fee given above.

If you have any questions regarding this proposal, please feel free to call.

Sincerely,

Mark Garand

Mark Garand
Associate, Electrical

MG/heo

BankOfAmericaTICamasRev1Fee

Staff Report

October 3, 2022 Council Workshop

American Rescue Plan Act Status Presentation
Presenter: Cathy Huber Nickerson, Finance Director and Debra Brooks, Financial Analyst
Time Estimate: 10 minutes

Phone	Email
360.817.1537	chuber@cityofcamas.us

BACKGROUND: This presentation is to review the proposed uses for the funds and the process to appropriate in the 2023-2024 Budget adoption.

SUMMARY: The United States Congress approved the American Rescue Plan Act (ARPA) on March 11, 2021 to provide a $1.9 trillion package to provide direct relief to states, counties, cities, and towns as well as public utilities, libraries, and transit agencies. As a community of 50,000 or less, the City of Camas will receive a distribution of these funds over four years from the Washington State Department of Commerce.

Council approved Resolution 21-005 to accept the City of Camas $6,816,235 allocation of Coronavirus State and Local Relief Funds (CLFRF). The City received the first tranche of $3,408,118 on June 30, 2021.

These funds can be used for:

- To respond to public health emergency caused by COVID-19
- To aid households, small businesses, and nonprofits related to the negative economic impacts of COVID-19,
- For premium pay (hazard pay) up to $13/hour, not to exceed $25,000 to any individual employee, to eligible government essential workers,
- To provide government services to the extent of the reduction in revenue of such cities/counties due to COVID-19 relative to revenues collected in the most recent full fiscal year prior to the emergency (for cities in Washington, the baseline would be the calendar year 2019 budget),
- To make necessary investments in water, sewer, or broadband infrastructure.

On January 6, 2022, the U.S. Treasury issued Final Guidance for the use of ARPA funds. The most significant changes are the expansion and simplification of the Revenue Lost category. For jurisdictions less than 50,000 in population, the U.S. Treasury allows for the option for jurisdictions so opt for the “standard allowance” not to exceed $10 million. This option allows Camas to opt for the whole $6.8 million as a standard allowance or a portion. The funds would be used for any traditional government service with simplified reporting requirements and federal audit considerations. Staff will review how this option may change the use of allocation of CLFRF.

EQUITY CONSIDERATIONS: What are the desired results and outcomes for this agenda item? The intent of the presentation is to provide City Council on ARPA status and uses.

What's the data? What does the data tell us? The US Treasury has provided final guidance.

How have communities been engaged? Are there opportunities to expand engagement? The City has had one round of public engagement in the Fall. The public was asked using Engage Camas to rank the priorities of Council's guidance for the use of the funds.

Who will benefit from, or be burdened by this agenda item? This agenda item is intended to benefit citizens and the community to offset the negative impact the pandemic has had the economy.

What are the strategies to mitigate any unintended consequences? Staff is monitoring for updates on ARPA daily and will plan accordingly.

Does this agenda item have a differential impact on underserved populations, people living with disabilities, and/or communities of color? Please provide available data to illustrate this impact. Yes, this agenda item helps all communities the City serves.

Will this agenda item improve ADA accessibilities for people with disabilities? N/A

What potential hurdles exists in implementing this proposal (include both operational and political)? As will any funding, it is difficult to ensure all needs are met and as a result some prioritization will need to occur.

How will you ensure accountabilities, communicate, and evaluate results? The Finance Department will provide updates of the ARPA to City Council.

How does this item support a comprehensive plan goal, policy, or other adopted resolution? This item is intended to bridge financial gaps due to loss revenue during the pandemic which impact ability to maintain service levels.

BUDGET IMPACT: The presentation will provide the recommendation for the Mayor's Recommended Budget.

RECOMMENDATION: This item is for Council information only.

AMERICAN RESCUE PLAN ACT (ARPA)

City of Camas

What is ARPA?

ARPA was signed into law on March 11, 2021

Provides direct relief to all municipalities with $350 billion for the Coronavirus State and Local Fiscal Recovery Funds.

Eligibility and Allocations

City of Camas received $6,816,235 in two equal installments – June, 2021 and June, 2022

Fiscal Recovery Funds Uses

Public Health Emergency/Negative Impacts

Premium Pay for essential workers in COVID-19

Revenue Loss

Water, Sewer or Broadband Infrastructure

The final rule

Expands and simplifies the "Replace Lost Revenue" category

Adds a standard allowance for revenue loss, allowing the City to select a standard amount of revenue loss, not to exceed $10 million vs the calculation of the elaborate formula outlined in the final rule. Think income tax standard exemption.

This category allows the broadest eligibility for expenditures of recovery of funds, namely the provision of any traditional government services.

Greater simplicity with regard to reporting, compliance with federal rules and single audit considerations

Saves staff time in reporting and tracking.

City Council ARPA Process

1. **Acceptance**
   June 2021 Council accepted the ARPA funds

2. **Account and Report**
   April 2022 Council approved the Standard Allowance

3. **How to Spend**
   - Research Options
   - Public Outreach
   - Staff Recommendations

4. **Appropriation**
   - 2023-2024 Budget Process

5. **Implement Budget**
   - Transparent Budgeting

6. **Reporting and Audit**
   - State Audit
   - Council Reports

COUNCIL APPROVED USES TO DATE

CYBERSECURITY

$1,000,000

Citizen Self Service

$400,000

Community Assistance

$88,000

PROPOSED PROJECTS

2023-2024 Proposed ARPA Projects

Homeless Assistance Locally	Police Cameras	IT Network Equipment Replacement
Phone System Replacement	Library Children’s Learning Hive	Cemetery Columbarium and Niche Wall
Ambulance Gurney Uplift	Breathing Apparatus Refilling System	Vehicle Extraction Tool Replacement

General Fund Contribution

Enables Additional Projects:

- Crown Park Redevelopment
- Fallen Leaf Lake Picnic Shelter Replacement
- Major Building Maintenance
- Library Security

QUESTIONS

Staff Report

June 21, 2022 Council Workshop

Mayor's 2023-2024 Recommended Budget Presentation
Presenter: Cathy Huber Nickerson, Finance Director and Debra Brooks, Financial Analyst
Time Estimate: 10 minutes

Phone	Email
360.817.1537 360.817.7025	chuber@cityofcamas.us dbrooks@cityofcamas.us

BACKGROUND: This presentation is to present the Mayor's Recommended 2023-2024 Budget to Council, Leadership Team, and the Camas community.

SUMMARY: In prior budget cycles, the budget preparation was more staff driven in response to City Council themes from the Annual Planning Conference and the Mayor's input. The 2023-2024 Budget cycle is attempting a more collaborative process by:

- Leadership working collaboratively with staff to put forth decision packages for the Camas community to provide comment, present to Council, and work directly with the Executive Team.
- Council will have multiple opportunities in workshops, retreats, public hearings, documents, public engagement reports, and council meetings to consider the proposed budget.
- Mayor will be working with staff in the formative stages of the budget leading to the Mayor's recommended budget to incorporate input from Leadership, Council, and the Community.
- Community will have a variety of ways to provide input including Camas Days booth, Balancing Act, Engage Camas, public hearings, citizen advisory boards, and Farmer's Market booths.

This budget cycle has resulted in the Mayor's Recommended Budget for 2023-2024 reflecting the priorities of the whole community with future planning documents to guide the City forward. Staff will provide the budget as required at the City Council Workshop.

EQUITY CONSIDERATIONS:

What are the desired results and outcomes for this agenda item? The intent of the presentation is to provide City Council a proposed budget process to better meet the requests of the Mayor, Council, and the community.

What's the data? What does the data tell us? N/A.

How have communities been engaged? Are there opportunities to expand engagement? This presentation will outline the plan to expand public engagement in the budget process.

Who will benefit from, or be burdened by this agenda item? This agenda item provides context for decision making for City Council.

What are the strategies to mitigate any unintended consequences? N/A

Does this agenda item have a differential impact on underserved populations, people living with disabilities, and/or communities of color? Please provide available data to illustrate this impact. Staff is looking to provide different options for gathering public comment.

Will this agenda item improve ADA accessibilities for people with disabilities? Yes, data can be communicated in accessible forms.

What potential hurdles exists in implementing this proposal (include both operational and political)? The hurdles are staff time and access to data. This is a project which will take time and commitment. This is a long-term project.

How will you ensure accountabilities, communicate, and evaluate results? There will be communications plan built into the project and all data will be incorporated into the 2023-2024 budget document.

How does this item support a comprehensive plan goal, policy, or other adopted resolution? This item provides open and transparent financial reporting which is a goal of the City's strategic plan and meets best financial practices.

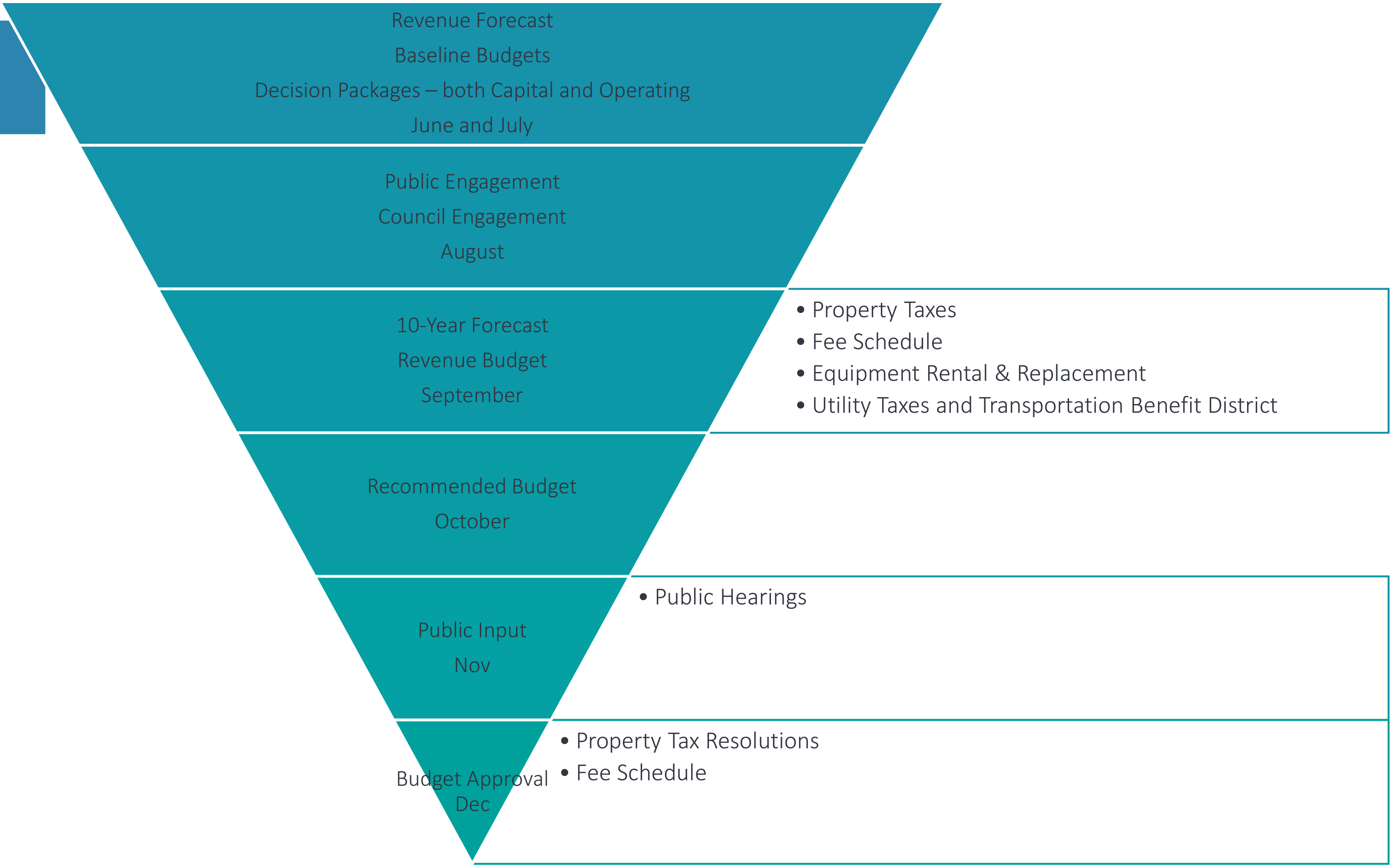
BUDGET IMPACT: This agenda item presents the Mayor's Recommended 2023-2024 Budget for a two-month public process prior to adoption in December.

RECOMMENDATION: Information only. Staff will present details of the budget in a series of presentations and public engagement over the next two months before Council's consideration on December 5, 2022.

City of Camas
City of Hope

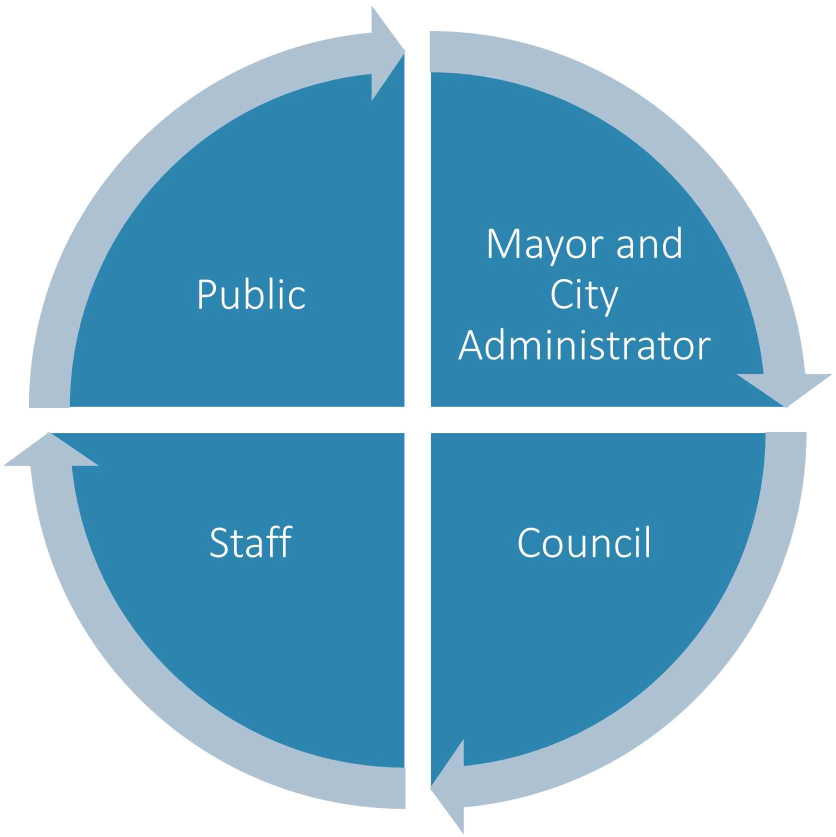
Mayor’s 2023-2024 Recommended Budget

October 3, 2022



Budget Process

Collaborative and Interactive Process



Hope for the Future

- Budget focused on:
  - Staffing and Facilities
  - Economic Development
  - Environmental Sustainability
  - Affordable Housing

4

Mayor's Recommended Budget 2023-2024

- Budget addresses:
  - Critical needs
  - Compliance
  - Risk Management
  - Discretionary

5

4 Months in the making

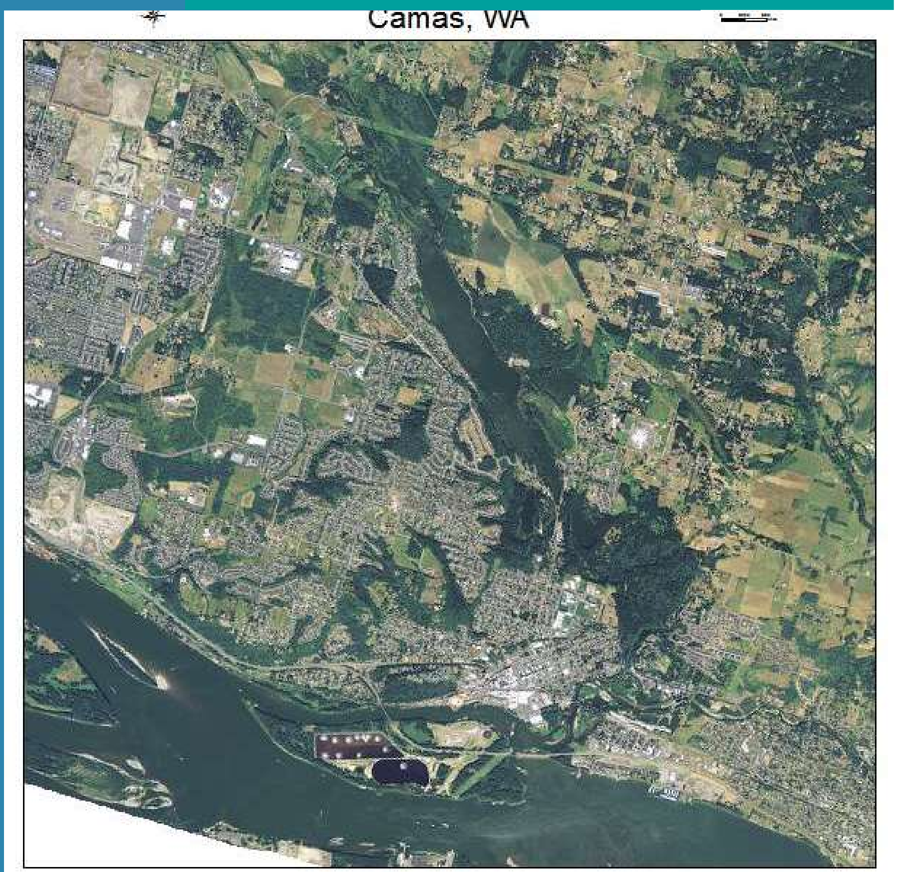
City of Camas
2023-2024 Mayor's Recommended Budget

Fund	Projected Beginning Fund Balance	2023-2024 Revenues	2023-2024 Appropriation	Projected Ending Fund Balance	Change in Fund Balance	
General	$ 13,983,314	$ 70,462,732	$ 74,508,024	$ 9,938,022	$ (4,045,292)	26%
City Street	$ 2,106,931	$ 9,357,027	$ 7,812,074	$ 3,651,884	$ 1,544,953	
American Rescue Plan Act (ARPA funding)	$ 6,236,616	$ 75,001	$ 6,311,617	$ -	$ (6,236,616)	
Tree Fund	$ 15,580	$ 204	$ -	$ 15,784	$ 204	
C/W Fire and EMS	$ 1,888,019	$ 34,070,641	$ 35,101,091	$ 857,569	$ (1,030,450)	
Lodging Tax	$ 59,634	$ 48,028	$ 65,000	$ 42,662	$ (16,972)	
Cemetery	$ 295,904	$ 571,615	$ 590,010	$ 277,509	$ (18,395)	
Limited G.O. Bond Debt Service	$ -	$ 6,540,138	$ 6,540,138	$ -	$ -	
Real Estate Excise Tax Capital	$ 15,047,340	$ 10,723,608	$ 14,923,573	$ 10,847,375	$ (4,199,965)	
Park Impact Fee Capital	$ 3,851,009	$ 4,564,291	$ 2,216,008	$ 6,199,292	$ 2,348,283	
Transportation Impact Fee Capital	$ 3,662,476	$ 2,591,120	$ 2,460,214	$ 3,793,382	$ 130,906	
Fire Impact Fee	$ 1,249,588	$ 544,452	$ 870,927	$ 923,113	$ (326,475)	
NW 38th Ave Phase 3 Construction	$ -	$ 6,100,400	$ 6,100,400	$ -	$ -	
Facilities Capital	$ 1,502,473	$ 8,633,883	$ 8,633,883	$ 1,502,473	$ -	
Legacy Lands Project	$ 5,915,535	$ 21,304	$ 150,000	$ 5,786,839	$ (128,696)	
Storm Water Utility	$ 3,178,724	$ 4,480,882	$ 6,642,413	$ 1,017,193	$ (2,161,531)	
City Solid Waste	$ 4,019,129	$ 6,885,529	$ 6,100,428	$ 4,804,230	$ 785,101	
Water-Sewer	$ 14,868,540	$ 32,413,055	$ 38,795,242	$ 8,486,353	$ (6,382,187)	
Water-Sewer Capital Projects	$ -	$ 9,710,000	$ 9,710,000	$ -	$ -	
North Shore Sewer Construction Project	$ 245,340	$ -	$ -	$ 245,340	$ -	
2019 Water Construction Projects	$ 6,236,979	$ -	$ -	$ 6,236,979	$ -	
Water-Sewer Capital Reserve	$ 16,177,490	$ 5,798,056	$ 9,650,000	$ 12,325,546	$ (3,851,944)	
Water-Sewer Bond Reserve	$ 1,724,690	$ 10,747	$ -	$ 1,735,437	$ 10,747	
Equipment Rental	$ 2,587,762	$ 4,624,382	$ 5,358,455	$ 1,853,689	$ (734,073)	
Firefighter's Pension	$ 1,140,609	$ 17,679	$ 188,014	$ 970,275	$ (170,335)	
Retiree Medical	$ 13,371	$ 317,111	$ 318,120	$ 12,362	$ (1,009)	
LEOFF 1 Disablity Board	$ 526,778	$ 355,277	$ 448,241	$ 433,814	$ (92,964)	
Total City Budget 2021-2022	**$ 106,533,832**	**$ 218,917,162**	**$ 243,493,871**	**$ 81,957,123**	**$ (24,576,710)**	

Balanced Budget for the next 2 years

City of Camas
Summary of Recommended Budgeted Revenues, Expenditures and Reserves

	General Fund	Special Revenue Funds	Debt Funds	Capital Funds	Enterprise Funds	Internal Support Funds	Reserve Funds	Total
Estimated Beginning Fund Balance 1/1/2023	$ 13,983,314	$ 10,602,684	$ -	$ 31,228,422	$ 46,450,892	$ 2,587,762	$ 1,680,758	$ 106,533,832
Revenues								
Taxes	$ 47,733,580	$ 5,339,346	$ -	$ 8,291,431				$ 61,364,357
Licenses and Permits	$ 2,506,149	$ 245,906						$ 2,752,055
Intergovernmental	$ 1,494,581	$ 2,347,145		$ 5,098,400				$ 8,940,126
Charges for Services	$ 12,094,253	$ 14,795,124		$ 7,420,389	$ 48,339,570	$ 4,601,331		$ 87,250,667
Fines and Forfeitures	$ 251,671	$ 24,420						$ 276,091
Miscellaneous Revenue	$ 773,272	$ 140,061		$ 595,955	$ 909,060	$ 23,051	$ 24,817	$ 2,466,216
Non-Revenues	$ -			$ 9,964,000	$ -			$ 9,964,000
Transfers	$ 5,609,226	$ 21,230,514	$ 6,540,138	$ 1,808,883	$ 10,049,639		$ 665,250	$ 45,903,650
Total Revenue	$ 70,462,732	$ 44,122,516	$ 6,540,138	$ 33,179,058	$ 59,298,269	$ 4,624,382	$ 690,067	$ 218,917,162
Total Available Resources	$ 84,446,046	$ 54,725,200	$ 6,540,138	$ 64,407,480	$ 105,749,161	$ 7,212,144	$ 2,370,825	$ 325,450,994
Expenditures								
Salaries and Benefits	$ 38,301,980	$ 30,161,289			$ 10,729,575	$ 1,304,064	$ 766,361	$ 81,263,269
Supplies and Services	$ 12,896,955	$ 7,665,917		$ 521,730	$ 17,253,805	$ 1,417,441	$ 7,177	$ 39,763,025
Intergovernmental	$ 1,954,302	$ 447,624			$ 1,743,495			$ 4,145,421
Capital	$ 2,451,901	$ 4,823,586		$ 24,734,283	$ 22,460,000	$ 2,636,950		$ 57,106,720
Debt Service		$ -	$ 6,540,138		$ 8,770,682			$ 15,310,820
Transfers	$ 18,902,886	$ 6,781,376		$ 10,098,992	$ 9,940,526		$ 180,836	$ 45,904,616
Total Expenditures	$ 74,508,024	$ 49,879,792	$ 6,540,138	$ 35,355,005	$ 70,898,083	$ 5,358,455	$ 954,374	$ 243,493,871
Estimated Ending Fund Balance	$ 9,938,022	$ 4,845,408	$ -	$ 29,052,475	$ 34,851,078	$ 1,853,689	$ 1,416,451	$ 81,957,123
Total Expenditures and Reserve Balance	$ 84,446,046	$ 54,725,200	$ 6,540,138	$ 64,407,480	$ 105,749,161	$ 7,212,144	$ 2,370,825	$ 325,450,994

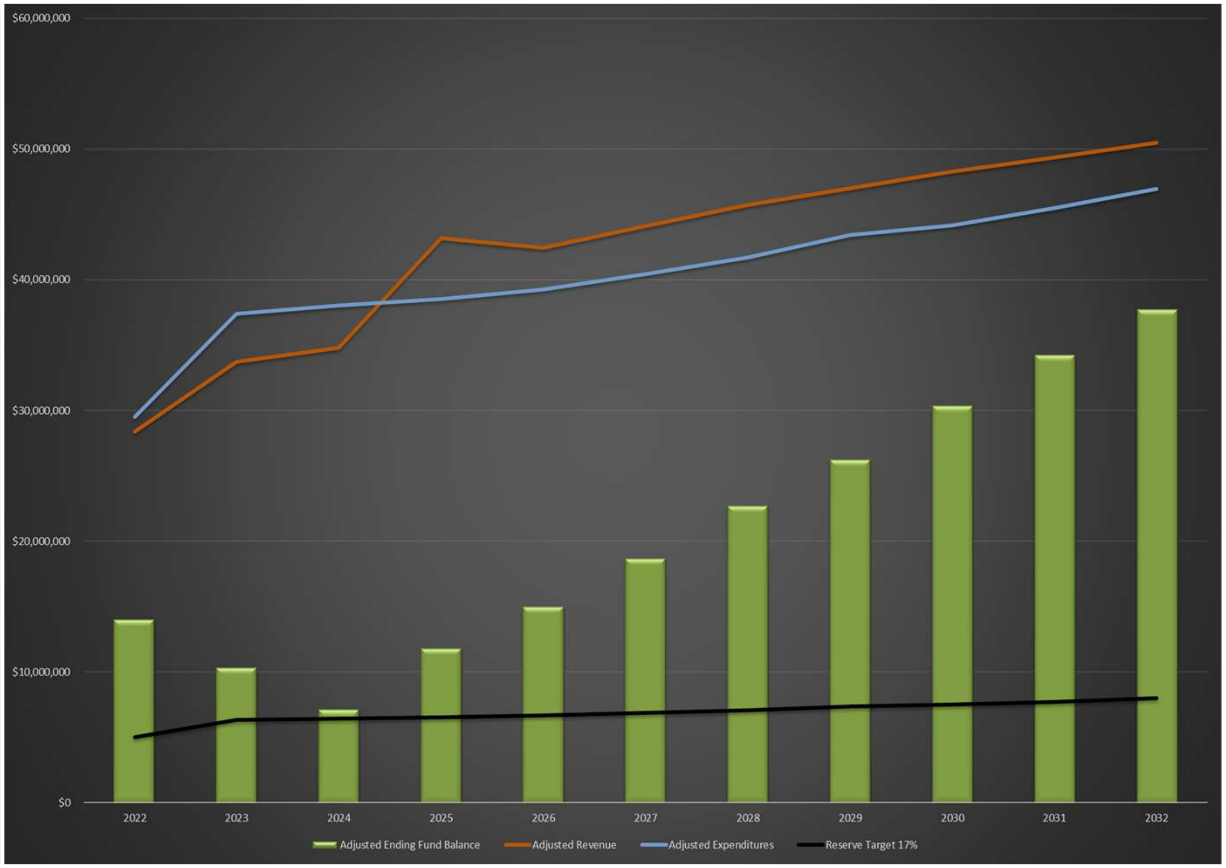


Highlights

- Addresses critical components of the City's Facilities Assessment ($7 million)
- Life Saving Equipment ($2 million)
- Essential transportation routes enhanced($8.6 million)
- Park Development and Trails ($7.4 million)
- Investment in our Library ($1.2 million
- Critical Technology ($1.3 million)

Revenue Assumptions

- Property Tax increase of 1%
- 3% Utility Taxes on
  - Water
  - Stormwater
  - Solid Waste
  - Sewer
- ARPA Funding
- LTGO Bond



Next Steps

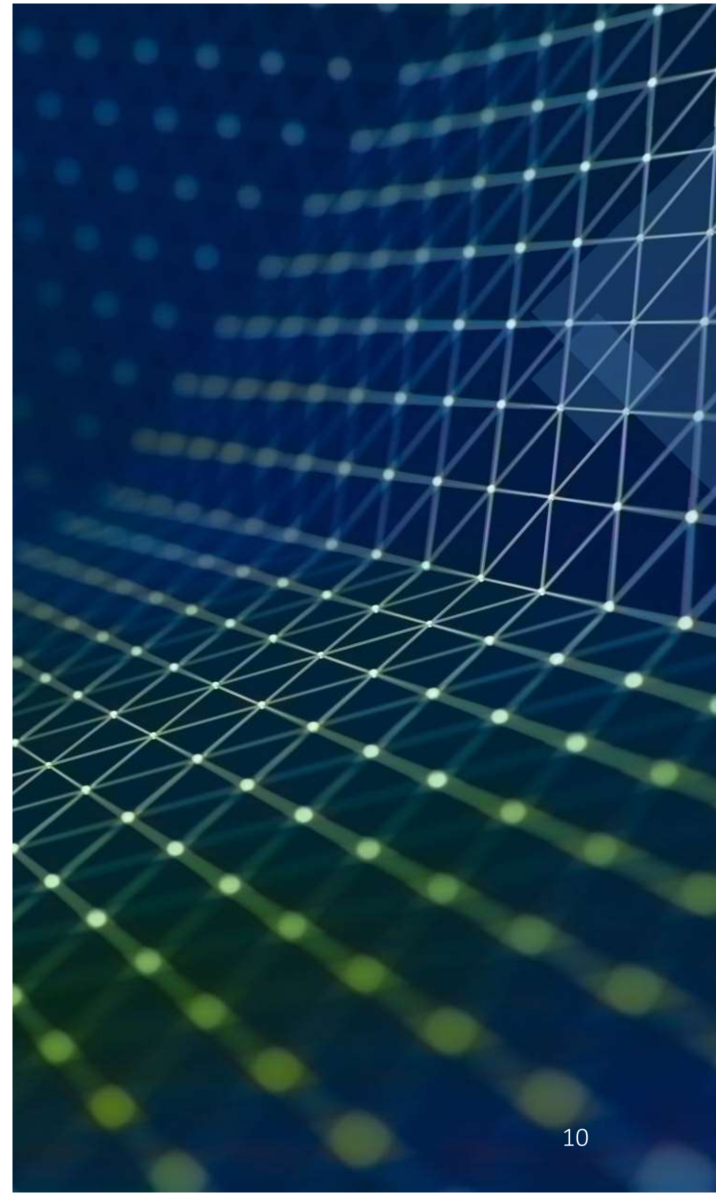
17 Oct.
Learn more about the Recommended Operating Budget, property taxes and utility taxes

Ongoing
Ongoing in October
- Public engagement on utility taxes – more to come on a City Open House

7 Nov.
Learn more about the Recommended Capital Budget

21 Nov.
Share with the Council your thoughts during the public hearings

5 Dec.
Council considers the 2023-2024 City of Camas Budget



City of Camas
2023-2024 Mayor's Recommended Budget

Fund	Projected Beginning Fund Balance	2023-2024 Revenues	2023-2024 Appropriation	Projected Ending Fund Balance	Change in Fund Balance	
General	$ 13,983,314	$ 70,462,732	$ 74,508,024	$ 9,938,022	$ (4,045,292)	26%
City Street	$ 2,106,931	$ 9,357,027	$ 7,812,074	$ 3,651,884	$ 1,544,953	
American Rescue Plan Act (ARPA funding)	$ 6,236,616	$ 75,001	$ 6,311,617	$ -	$ (6,236,616)	
Tree Fund	$ 15,580	$ 204	$ -	$ 15,784	$ 204	
C/W Fire and EMS	$ 1,888,019	$ 34,070,641	$ 35,101,091	$ 857,569	$ (1,030,450)	
Lodging Tax	$ 59,634	$ 48,028	$ 65,000	$ 42,662	$ (16,972)	
Cemetery	$ 295,904	$ 571,615	$ 590,010	$ 277,509	$ (18,395)	
Limited G.O. Bond Debt Service	$ -	$ 6,540,138	$ 6,540,138	$ -	$ -	
Real Estate Excise Tax Capital	$ 15,047,340	$ 10,723,608	$ 14,923,573	$ 10,847,375	$ (4,199,965)	
Park Impact Fee Capital	$ 3,851,009	$ 4,564,291	$ 2,216,008	$ 6,199,292	$ 2,348,283	
Transportation Impact Fee Capital	$ 3,662,476	$ 2,591,120	$ 2,460,214	$ 3,793,382	$ 130,906	
Fire Impact Fee	$ 1,249,588	$ 544,452	$ 870,927	$ 923,113	$ (326,475)	
NW 38th Ave Phase 3 Construction	$ -	$ 6,100,400	$ 6,100,400	$ -	$ -	
Facilities Capital	$ 1,502,473	$ 8,633,883	$ 8,633,883	$ 1,502,473	$ -	
Legacy Lands Project	$ 5,915,535	$ 21,304	$ 150,000	$ 5,786,839	$ (128,696)	
Storm Water Utility	$ 3,178,724	$ 4,480,882	$ 6,642,413	$ 1,017,193	$ (2,161,531)	
City Solid Waste	$ 4,019,129	$ 6,885,529	$ 6,100,428	$ 4,804,230	$ 785,101	
Water-Sewer	$ 14,868,540	$ 32,413,055	$ 38,795,242	$ 8,486,353	$ (6,382,187)	
Water-Sewer Capital Projects	$ -	$ 9,710,000	$ 9,710,000	$ -	$ -	
North Shore Sewer Construction Project	$ 245,340	$ -	$ -	$ 245,340	$ -	
2019 Water Construction Projects	$ 6,236,979	$ -	$ -	$ 6,236,979	$ -	
Water-Sewer Capital Reserve	$ 16,177,490	$ 5,798,056	$ 9,650,000	$ 12,325,546	$ (3,851,944)	
Water-Sewer Bond Reserve	$ 1,724,690	$ 10,747	$ -	$ 1,735,437	$ 10,747	
Equipment Rental	$ 2,587,762	$ 4,624,382	$ 5,358,455	$ 1,853,689	$ (734,073)	
Firefighter's Pension	$ 1,140,609	$ 17,679	$ 188,014	$ 970,275	$ (170,335)	
Retiree Medical	$ 13,371	$ 317,111	$ 318,120	$ 12,362	$ (1,009)	
LEOFF 1 Disablity Board	$ 526,778	$ 355,277	$ 448,241	$ 433,814	$ (92,964)	
Total City Budget 2021-2022	**$ 106,533,832**	**$ 218,917,162**	**$ 243,493,871**	**$ 81,957,123**	**$ (24,576,710)**	

City of Camas
Summary of Recommended Budgeted Revenues, Expenditures and Reserves

	General Fund	Special Revenue Funds	Debt Funds	Capital Funds	Enterprise Funds	Internal Support Funds	Reserve Funds	Total
Estimated Beginning Fund Balance 1/1/2023	$ 13,983,314	$ 10,602,684	$ -	$ 31,228,422	$ 46,450,892	$ 2,587,762	$ 1,680,758	$ 106,533,832
Revenues								
Taxes	$ 47,733,580	$ 5,339,346	$ -	$ 8,291,431				$ 61,364,357
Licenses and Permits	$ 2,506,149	$ 245,906						$ 2,752,055
Intergovernmental	$ 1,494,581	$ 2,347,145		$ 5,098,400				$ 8,940,126
Charges for Services	$ 12,094,253	$ 14,795,124		$ 7,420,389	$ 48,339,570	$ 4,601,331		$ 87,250,667
Fines and Forfeitures	$ 251,671	$ 24,420						$ 276,091
Miscellaneous Revenue	$ 773,272	$ 140,061		$ 595,955	$ 909,060	$ 23,051	$ 24,817	$ 2,466,216
Non-Revenues	$ -			$ 9,964,000	$ -			$ 9,964,000
Transfers	$ 5,609,226	$ 21,230,514	$ 6,540,138	$ 1,808,883	$ 10,049,639		$ 665,250	$ 45,903,650
Total Revenue	$ 70,462,732	$ 44,122,516	$ 6,540,138	$ 33,179,058	$ 59,298,269	$ 4,624,382	$ 690,067	$ 218,917,162
Total Available Resources	$ 84,446,046	$ 54,725,200	$ 6,540,138	$ 64,407,480	$ 105,749,161	$ 7,212,144	$ 2,370,825	$ 325,450,994
Expenditures								
Salaries and Benefits	$ 38,301,980	$ 30,161,289			$ 10,729,575	$ 1,304,064	$ 766,361	$ 81,263,269
Supplies and Services	$ 12,896,955	$ 7,665,917		$ 521,730	$ 17,253,805	$ 1,417,441	$ 7,177	$ 39,763,025
Intergovernmental	$ 1,954,302	$ 447,624			$ 1,743,495			$ 4,145,421
Capital	$ 2,451,901	$ 4,823,586		$ 24,734,283	$ 22,460,000	$ 2,636,950		$ 57,106,720
Debt Service		$ -	$ 6,540,138		$ 8,770,682			$ 15,310,820
Transfers	$ 18,902,886	$ 6,781,376		$ 10,098,992	$ 9,940,526		$ 180,836	$ 45,904,616
Total Expenditures	$ 74,508,024	$ 49,879,792	$ 6,540,138	$ 35,355,005	$ 70,898,083	$ 5,358,455	$ 954,374	$ 243,493,871
Estimated Ending Fund Balance	$ 9,938,022	$ 4,845,408	$ -	$ 29,052,475	$ 34,851,078	$ 1,853,689	$ 1,416,451	$ 81,957,123
Total Expenditures and Reserve Balance	$ 84,446,046	$ 54,725,200	$ 6,540,138	$ 64,407,480	$ 105,749,161	$ 7,212,144	$ 2,370,825	$ 325,450,994

City of Camas
Recommended Revenue Budget Summary for 2022-2023

	2021 Actual	2022 Projected	Change	2023 Budget	Annual % Change	2023 Change	2024 Budget	Annual % Change	2024 Change	Notes
General Fund										
Taxes	$ 20,238,071	$ 21,055,295	4.0%	$ 22,915,996	8.8%	$ 1,860,701	$ 24,817,584	8.3%	$ 1,901,588	Pub Saf Sales Tax, Utility Tax 3%, commercial growth
Licenses and Permits	$ 1,289,798	$ 790,105	-38.7%	$ 790,290	0.0%	$ 185	$ 1,715,859	117.1%	$ 925,569	Slower Residential Growth, commercial growth 2025
Intergovernmental	$ 883,892	$ 738,802	-16.4%	$ 734,828	-0.5%	$ (3,974)	$ 759,753	3.4%	$ 24,925	Status quo state shared revenues
Charges for Services	$ 5,204,720	$ 5,000,007	-3.9%	$ 5,324,070	6.5%	$ 324,063	$ 6,770,183	27.2%	$ 1,446,113	Commercial growth construction fees
Fines and Forfeitures	$ 131,698	$ 115,857	-12.0%	$ 122,489	5.7%	$ 6,632	$ 129,182	5.5%	$ 6,693	Change in state laws
Miscellaneous Revenue	$ 301,284	$ 466,584	54.9%	$ 381,865	-18.2%	$ (84,719)	$ 391,407	2.5%	$ 9,542	Status quo rentals and lower interest income
Transfers from other funds		$ 227,607	100.0%	$ 2,589,379	1037.7%	$ 2,361,772	$ 3,019,847	16.6%	$ 430,468	ARPA projects
Total General Fund	$ 28,049,463	$ 28,394,257	1.2%	$ 32,858,917	15.7%	$ 4,464,660	$ 37,603,815	14.4%	$ 4,744,898	
Special Revenue Funds										
Street Fund										
Intergovernmental	$ 516,281	$ 521,290	1.0%	$ 562,440	7.9%	$ 41,150	$ 582,125	3.5%	$ 19,685	Status quo Motor Vehicle Gax Tax
Miscellaneous Revenue	$ 34,767	$ 12,448	-64.2%	$ 12,218	-1.8%	$ (230)	$ 12,442	1.8%	$ 224	No budget for insurance recovery
Transfers from other funds	$ 2,357,331	$ 3,815,851	61.9%	$ 3,664,182	-4.0%	$ (151,669)	$ 4,523,620	23.5%	$ 859,438	Preservation, ARPA & GF Subsidy
Total Street Fund	$ 2,908,379	$ 4,349,589	49.6%	$ 4,238,840	-2.5%	$ (110,749)	$ 5,118,187	20.7%	$ 879,347	
ARPA										
Intergovernmental	$ 3,411,447	$ 3,411,446	0.0%			$ (3,411,446)			$ -	ARPA Stimulus Funds
Miscellaneous Revenue	$ 9,208	$ 35,351	283.9%	$ 36,765	4.0%	$ 1,414	$ 38,236	4.0%	$ 1,471	Status quo interest income
Total ARPA Fund	$ 3,420,655	$ 3,446,797	0.8%	$ 36,765	-98.9%	$ (3,410,032)	$ 38,236	4.0%	$ 1,471	
Tree Fund										
Miscellaneous Revenue	$ 140	$ 95	-32.1%	$ 100	5.3%	$ 5	$ 104	4.0%	$ 4	Status quo interest income
Total Tree Fund	$ 140	$ 95	-32.1%	$ 100	5.3%	$ 5	$ 104	4.0%	$ 4	
C/W Fire and EMS Fund										
Taxes	$ 2,356,877	$ 2,463,518	4.5%	$ 2,554,113	3.7%	$ 90,595	$ 2,737,956	7.2%	$ 183,843	Slower residential growth with higer commercial 2024
Licenses and Permits	$ 81,584	$ 87,332	7.0%	$ 75,175	-13.9%	$ (12,157)	$ 170,731	127.1%	$ 95,556	Residential construction slows
Intergovernmental	$ 680,344	$ 620,240	100.0%	$ 601,290	-3.1%	$ (18,950)	$ 601,290	0.0%	$ -	GEMT
Charges for Services	$ 5,334,154	$ 5,778,175	8.3%	$ 7,044,122	21.9%	$ 1,265,947	$ 7,582,497	7.6%	$ 538,375	Washougal's share adjustment
Fines and Forfeitures	$ 251	$ 8,370	3234.7%	$ 12,000	43.4%	$ 3,630	$ 12,420	3.5%	$ 420	Post COVID-19
Miscellaneous Revenue	$ 89,744	$ 23,568	-73.7%	$ 17,966	-23.8%	$ (5,602)	$ 18,369	2.2%	$ 403	Private contribution 2021
Transfers from other funds	$ 3,590,358	$ 4,371,775	21.8%	$ 5,639,377	29.0%	$ 1,267,602	$ 7,003,335	24.2%	$ 1,363,958	Camas transfers from ARPA, REET, FIF
Total C/W Fire and EMS Fund	$ 12,133,312	$ 13,352,978	10.1%	$ 15,944,043	19.4%	$ 2,591,065	$ 18,126,598	13.7%	$ 2,182,555	
Lodging Tax Fund										
Taxes	$ 21,411	$ 22,611	5.6%	$ 23,289	3.0%	$ 678	$ 23,988	3.0%	$ 699	Vacation rentals
Miscellaneous Revenue	$ 389	$ 354	-9.0%	$ 368	4.0%	$ 14	$ 383	300.0%	$ 15	Status quo interest income
Total Lodging Tax Fund	$ 21,800	$ 22,965	5.3%	$ 23,657	3.0%	$ 692	$ 24,371	3.0%	$ 714	
Cemetery Fund										
Charges for Services	$ 99,518	$ 80,758	-18.9%	$ 82,803	2.5%	$ 2,045	$ 85,702	3.5%	$ 2,899	Trends and fee increases
Miscellaneous Revenue	$ 3,634	$ 1,509	-58.5%	$ 1,540	2.1%	$ 31	$ 1,570	1.9%	$ 30	Grant in 2021
Transfers from other funds	$ 200,000	$ 200,000	0.0%	$ 200,000	0.0%	$ -	$ 200,000	0.0%	$ -	Transfer from General Fund
Total Cemetery Fund	$ 303,152	$ 282,267	-6.9%	$ 284,343	0.7%	$ 2,076	$ 287,272	1.0%	$ 2,929	
Debt Funds										
Unlimited GO Debt Service Fund										
Taxes	$ 5,894	$ -	-100.0%	$ -		$ -			$ -	2020 last yr of levy and debt payments
Total Unlimited GO Debt Srv Fund	$ 5,894	$ -	-100.0%	$ -		$ -	$ -		$ -	
Limited Debt Service Fund										
Transfers from other funds	$ 10,565,513	$ 3,362,693	-68.2%	$ 3,372,843	0.3%	$ 10,150	$ 3,167,295	-6.1%	$ (205,548)	Based on DS schedules
Total Debt Service Fund	$ 10,565,513	$ 3,362,693	-68.2%	$ 3,372,843	0.3%	$ 10,150	$ 3,167,295	-6.1%	$ (205,548)	

EXHIBIT A

Item 8.

	2021 Actual	2022 Projected	Change	2023 Budget	Annual % Change	2023 Change	2024 Budget	Annual % Change	2024 Change	Notes
Capital Fund										
Real Estate Excise Tax Fund										
Taxes	$ 4,049,990	$ 3,911,420	-3.4%	$ 4,065,094	3.9%	$ 153,674	$ 4,226,337	4.0%	$ 161,243	Improving real estate market in 2024
Intergovernmental	$ 2,215,191	$ 275,613	-87.6%	$ 212,000	-23.1%	$ (63,613)	$ -		$ (212,000)	State Grant for Bridge and RCO Grant 2021-2022
Miscellaneous Revenue	$ 4,696,911	$ 156,731	-96.7%	$ 146,127	-6.8%	$ (10,604)	$ 149,050	2.0%	$ 2,923	2023 LTGO Bond
Transfers from other funds	$ 239,899	$ 236,423	-1.4%	$ 175,000	-26.0%	$ (61,423)	$ -		$ (175,000)	Matching funds in 2021-2022
Non-Revenues				$ 1,750,000	100.0%	$ 1,750,000			$ (1,750,000)	
Total Real Estate Excise Tax Fund	$ 11,201,991	$ 4,580,187	-59.1%	$ 6,348,221	38.6%	$ 18,034	$ 4,375,387	-31.1%	$ (1,972,834)	
Park Impact Fee Fund										
Charges for Services	$ 1,265,530	$ 1,551,092	22.6%	$ 1,335,180	-13.9%	$ (215,912)	$ 3,032,327	127.1%	$ 1,697,147	Mult-Family Development and slowing of new constr.
Miscellaneous Revenue	$ 51,865	$ 95,508	84.1%	$ 97,418	2.0%	$ 1,910	$ 99,366	2.0%	$ 1,948	Status quo interest revenue
Transfer from other funds	$ 3,551	$ 2,088	-41.2%							
Total Park Impact Fee Fund	$ 1,320,946	$ 1,648,688	24.8%	$ 1,432,598	-13.1%	$ (214,002)	$ 3,131,693	118.6%	$ 1,699,095	
Transportation Impact Fee Fund										
Charges for Services	$ 1,948,332	$ 897,594	-53.9%	$ 772,649	-13.9%	$ (124,945)	$ 1,754,763	127.1%	$ 982,114	Mult-Family Development and slowing of new constr.
Miscellaneous Revenue	$ 34,974	$ 30,806	-11.9%	$ 31,854	3.4%	$ 1,048	$ 31,854	0.0%	$ -	Status quo interest income
Total Transportation Impact Fee Fund	$ 1,983,306	$ 928,400	-53.2%	$ 804,503	-13.3%	$ (123,897)	$ 1,786,617	122.1%	$ 982,114	
Fire Impact Fee Fund										
Charges for Services	$ 161,414	$ 186,617	15.6%	$ 160,640	-13.9%	$ (25,977)	$ 364,830	127.1%	$ 204,190	Mult-Family Development and slowing of new constr.
Miscellaneous Revenue	$ 10,547	$ 9,213	-12.6%	$ 9,397	2.0%	$ 2,547	$ 9,585	2.0%	$ 188	Status quo interest income
Total Fire Impact Fee Fund	$ 171,961	$ 195,830	13.9%	$ 170,037	-13.2%	$ (23,430)	$ 374,415	120.2%	$ 204,378	
NW 38th Ave Phase 3 Construction										
Intergovernmental	$ 334,761	$ 513,000	53.2%	$ 4,886,400	852.5%	$ 4,373,400		100.0%	$ (4,886,400)	State Grant
Transfers from other funds	$ 71,534	$ 38,428	-46.3%	$ -	100.0%	$ (38,428)	$ -		$ -	Transfers from TIF and General Fund
Non-Revenues	$ -			$ 1,214,000	100.0%					2023 LTGO Bond
Total NW 38th Ave Phase 3 Construction	$ 406,295	$ 551,428	35.7%	$ 6,100,400	1006.3%	$ 4,334,972	$ -	-100.0%	$ (6,100,400)	
Facilities Capital Fund										
Transfers from other funds	$ 2,500		-100.0%	$ 1,033,883	100.0%	$ 1,033,883	$ 600,000	-42.0%	$ (433,883)	Transfers from REET and General Fund
Non-Revenues	$ 1,511,776		100.0%	$ 7,000,000	100.0%	$ 7,000,000		-100.0%	$ (7,000,000)	2023 LTGO
Total Facilities Capital Fund	$ 1,514,276	$ -	-100.0%	$ 8,033,883	100.0%	$ 8,033,883	$ 600,000	-92.5%	$ (7,433,883)	
Legacy Lands Project Fund										
Miscellaneous Revenue	$ 3,514	$ 10,042	185.8%	$ 10,443	4.0%	$ 401	$ 10,861	4.0%	$ 418	Interest Earnings
Total Legacy Lands Project Fund	$ 3,514	$ 10,042	185.8%	$ 10,443	4.0%	$ 401	$ 10,861	4.0%	$ 418	
Enterprise Funds										
Storm Water Fund										
Intergovernmental	$ 61,855	$ 53,694	-13.2%		-100.0%	$ (53,694)				State Grants
Charges for Services	$ 1,921,563	$ 2,008,748	4.5%	$ 2,112,460	5.2%	$ 103,712	$ 2,251,988	6.6%	$ 139,528	Rate Model and increase in Population
Miscellaneous Revenue	$ 26,715	$ 20,526	-23.2%	$ 41,404	101.7%	$ 20,878	$ 42,232	2.0%	$ 828	Status quo interest earnings
Transfer from other funds	$ 19,707	$ 27,495	39.5%	$ 20,376	100.0%	$ (7,119)	$ 12,422	-39.0%	$ (7,954)	ARPA funding
Total Storm Drainage Fund	$ 2,029,840	$ 2,110,463	4.0%	$ 2,174,240	3.0%	$ 70,896	$ 2,306,642	6.1%	$ 140,356	
Solid Waste Fund										
Charges for Services	$ 3,036,429	$ 3,121,159	2.8%	$ 3,266,371	4.7%	$ 145,212	$ 3,465,211	6.1%	$ 198,840	Rate Increase 2.5% + Population
Miscellaneous Revenue	$ 28,624	$ 24,748	-13.5%	$ 25,242	2.0%	$ 494	$ 25,747	2.0%	$ 505	Status quo interest earnings
Transfer from other funds		$ 42,160	100.0%	$ 63,962	51.7%	$ 21,802	$ 38,996	-39.0%	$ (24,966)	ARPA funding
Total Solid Waste Fund	$ 3,065,053	$ 3,188,067	4.0%	$ 3,355,575	5.3%	$ 167,508	$ 3,529,954	5.2%	$ 174,379	
Water/Sewer Fund										
Charges for Services	$ 15,451,086	$ 14,546,376	-5.9%	$ 15,345,265	5.5%	$ 798,889	$ 16,338,161	6.5%	$ 992,896	Rate Model and increase in population

EXHIBIT A

	2021 Actual	2022 Projected	Change	2023 Budget	Annual % Change	2023 Change	2024 Budget	Annual % Change	2024 Change	Notes
Miscellaneous Revenue	$ 397,339	$ 253,055	-36.3%	$ 260,320	2.9%	$ 7,265	$ 265,426	2.0%	$ 5,106	Status quo interest earnings
Non-Revenues	$ 42,016	$ 1,236	-97.1%		-100.0%	$ (1,236)				
Transfer from other funds	$ 11,042	$ 90,393	718.6%	$ 126,661	40.1%	$ 36,268	$ 77,222	-39.0%	$ (49,439)	ARPA funding
Total Water/Sewer Fund	$ 15,901,483	$ 14,891,060	-6.4%	$ 15,732,246	5.6%	$ 841,186	$ 16,680,809	6.0%	$ 948,563	
Water/Sewer Construction Fund										
Miscellaneous Revenue	$ 80	$ -	100.0%			$ -				
Transfer from other funds	$ 265,057	$ 443,886	67.5%	$ 1,210,000	172.6%	$ 766,114	$ 8,500,000	602.5%	$ 7,290,000	SDC Contributions & Rates
Total W/S Capital Fund	$ 265,137	$ 443,886	67.4%	$ 1,210,000	172.6%	$ 766,114	$ 8,500,000	602.5%	$ 7,290,000	
2019 Water Projects Construction Fund										
Miscellaneous Revenue	$ 25,811	$ 26,222	1.6%	$ -	-100.0%	$ (26,222)				
Transfer from other funds	$ 22,039	$ 6,620	-70.0%		-100.0%	$ (6,620)		-100.0%	$ -	
Total 2019 Water Proj Construction	$ 47,850	$ 32,842	-31.4%	$ -	-100.0%	$ (32,842)	$ -	-100.0%	$ -	
Water/Sewer Capital Reserve Fund										
Charges for Services	$ 3,455,163	$ 1,416,962	-59.0%	$ 2,739,545	93.3%	$ 1,322,583	$ 2,820,569	3.0%	$ 81,024	Mult-Family Development and slowing of new constr.
Miscellaneous Revenue	$ 131,705	$ 113,799	-13.6%	$ 117,213	3.0%	$ 3,414	$ 120,729	3.0%	$ 3,516	Status quo interest earnings
Total Water/Sewer Cap. Fund	$ 3,586,868	$ 1,530,761	-57.3%	$ 2,856,758	86.6%	$ 1,325,997	$ 2,941,298	3.0%	$ 84,540	
Water/Sewer Bond Reserve Fund										
Miscellaneous Revenue	$ 2,880	$ 5,140	78.5%	$ 5,294	3.0%	$ 154	$ 5,453	3.0%	$ 159	
Total Water/Sewer Bond Res. Fund	$ 2,880	$ 5,140	78.5%	$ 5,294	3.0%	$ 154	$ 5,453	3.0%	$ 159	
Internal Support Funds										
Equipment Rental Fund										
Charges for Services	$ 1,591,957	$ 1,958,449	23.0%	$ 2,388,659	22.0%	$ 430,210	$ 2,212,672	-7.4%	$ (175,987)	Updated ERR model
Miscellaneous Revenue	$ (14,905)	$ 11,025	-174.0%	$ 11,355	3.0%	$ 330	$ 11,696	3.0%	$ 341	Status quo interest earnings
Total Equipment Rental Fund	$ 1,577,052	$ 1,969,474	24.9%	$ 2,400,014	21.9%	$ 430,540	$ 2,224,368	-7.3%	$ (175,646)	
Reserve Funds										
Firefigher's Pension Fund										
Miscellaneous Revenue	$ 11,435	$ 8,455	-26.1%	$ 8,709	3.0%	$ 254	$ 8,970	3.0%	$ 261	Status quo interest earnings
Total Firemen's Pension Fund	$ 11,435	$ 8,455	-26.1%	$ 8,709	3.0%	$ 254	$ 8,970	3.0%	$ 261	
Retiree Medical Fund										
Miscellaneous Revenue	$ 459	$ 49	-89.3%	$ 50	2.0%	$ 1	$ 52	4.0%	$ 2	Status quo interest earnings
Transfers from other funds	$ 127,583	$ 130,135	2.0%	$ 156,162	20.0%	$ 26,027	$ 160,847	3.0%	$ 4,685	Increasing medical costs
Total Retiree Medical Fund	$ 128,042	$ 130,184	1.7%	$ 156,212	20.0%	$ 26,027	$ 160,899	3.0%	$ 4,687	
LEOFF 1 Disability Board										
Miscellaneous Revenue	$ 4,952	$ 3,365	-32.0%	$ 3,466	3.0%	$ 101	$ 3,570	3.0%	$ 104	Status quo interest earnings
Transfer from other funds	$ 157,124	$ 166,551	6.0%	$ 171,547	3.0%	$ 4,996	$ 176,694	3.0%	$ 5,147	
Total LEOFF 1 Disability Fund	$ 162,076	$ 169,916	4.8%	$ 175,013	3.0%	$ 4,996	$ 180,264	3.0%	$ 5,251	

City of Camas
Recommended Budget Appropriation Summary for 2023-2024

	2021 Actual	2022 Projected	Change	2023 Budget	Annual % Change	2023 Change	2024 Budget	Annual % Change	2024 Change	Notes
General Fund										
Salaries and Benefits	$ 13,213,867	$ 14,337,804	8.5%	$ 18,344,169	27.9%	$ 4,006,365	$ 19,957,811	8.8%	$ 1,613,642	Filled vacant positions, 2 new positions, seasonals
Supplies and Services	$ 4,236,012	$ 6,169,247	45.6%	$ 6,697,172	8.6%	$ 527,925	$ 6,199,783	-7.4%	$ (497,389)	ERP system, planning contracts,
Intergovernmental	$ 792,516	$ 1,044,055	31.7%	$ 946,987	-9.3%	$ (97,068)	$ 1,007,315	6.4%	$ 60,328	Increases from Clark Co. and State
Capital	$ 231,633	$ 568,985	145.6%	$ 1,609,806	182.9%	$ 1,040,821	$ 842,095	-47.7%	$ (767,711)	
Transfers to other funds	$ 6,578,427	$ 7,409,898	12.6%	$ 9,270,240	25.1%	$ 1,860,342	$ 9,632,646	3.9%	$ 362,406	
Total General Fund	$ 25,052,455	$ 29,529,989	17.9%	$ 36,868,374	24.9%	$ 7,338,385	$ 37,639,650	2.1%	$ 771,276	
Special Revenue Funds										
Street Fund										
Salaries and Benefits	$ 746,367	$ 765,177	2.5%	$ 869,362	13.6%	$ 104,185	$ 923,470	6.2%	$ 54,108	Positions filled, seasonals
Supplies and Services	$ 996,565	$ 1,103,999	10.8%	$ 1,399,421	26.8%	$ 295,422	$ 1,394,038	-0.4%	$ (5,383)	Transportation Plan, ERP
Intergovernmental	$ 37,097	$ 20,149	-45.7%	$ 40,599	101.5%	$ 20,450	$ 41,573	2.4%	$ 974	Striping Program
Capital	$ 404,892	$ 1,935,287	378.0%	$ 1,207,302	-37.6%	$ (727,985)	$ 1,552,430	28.6%	$ 345,128	Preservation Prog,
Transfers to other funds	$ -	$ 173,230	100.0%	$ 192,103	10.9%	$ 18,873	$ 191,776	-0.2%	$ (327)	Debt Service,Retiree Medical
Total Street Fund	$ 2,184,921	$ 3,997,842	83.0%	$ 3,708,787	-7.2%	$ (289,055)	$ 4,103,287	10.6%	$ 394,500	
ARPA Fund										
Supplies and Services	$ 80,606	$ 787	-99.0%							
Transfers to other funds		$ 549,443	100.0%	$ 3,119,288	467.7%	$ 2,569,845	$ 3,192,329	2.3%	$ 73,041	
Total ARPA Fund	$ 80,606	$ 550,230	582.6%	$ 3,119,288	466.9%	$ 2,280,790	$ 3,192,329	2.3%	$ 73,041	
Tree Fund										
Supplies and Services										
Total Tree Fund										
C/W Fire and EMS Fund										
Salaries and Benefits	$ 10,043,765	$ 12,253,966	22.0%	$ 14,169,308	15.6%	$ 1,915,342	$ 13,918,369	-1.8%	$ (250,939)	
Supplies and Services	$ 1,831,140	$ 2,049,322	11.9%	$ 2,278,575	11.2%	$ 229,253	$ 2,294,653	0.7%	$ 16,078	
Intergovernmental	$ 139,748	$ 162,051	16.0%	$ 180,559	11.4%	$ 188,250	$ 184,893	2.4%	$ 4,334	CRESA rates
Capital	$ 214,309	$ 66,345	-69.0%	$ 247,000	100.0%	$ 180,655	$ 1,741,854	605.2%	$ 1,494,854	Ambulance and Engines
Transfer to other funds	$ 41,342	$ 41,378	0.1%	$ 42,905	100.0%	$ 1,527	$ 42,975	0.2%	$ 70	
Total C/W Fire and EMS Fund	$ 12,270,304	$ 14,573,062	18.8%	$ 16,918,347	16.1%	$ 2,345,285	$ 18,182,744	7.5%	$ 1,264,397	
Lodging Tax Fund										
Supplies and Services	$ 5,024	$ 16,000	218.5%	$ 35,000	118.8%	$ 19,000	$ 30,000	-14.3%	$ (5,000)	Effort to reduce fund balance from COVID
Total Lodging Tax Fund	$ 5,024	$ 16,000	218.5%	$ 35,000	118.8%	$ 19,000	$ 30,000	-14.3%	$ (5,000)	
Cemetery Fund										
Salaries and Benefits	$ 121,200	$ 132,171	9.1%	$ 135,689	2.7%	$ 3,518	$ 145,091	6.9%	$ 9,402	
Supplies and Services	$ 67,333	$ 83,211	23.6%	$ 115,726	39.1%	$ 32,515	$ 118,504	2.4%	$ 2,778	
Capital		$ 80,000	100.0%	$ 37,500	-53.1%	$ (42,500)	$ 37,500	100.0%	$ 37,500	
Total Cemetery Fund	$ 188,533	$ 295,382	56.7%	$ 288,915	-2.2%	$ (6,467)	$ 301,095	17.2%	$ 49,680	
Debt Fund										
Limited GO Debt Service Fund										
Principal	$ 2,880,724	$ 2,911,975	1.1%	$ 1,923,948	-33.9%	$ (988,027)	$ 1,773,115	-7.8%	$ (150,833)	
Interest	$ 1,367,498	$ 956,762	-30.0%	$ 1,448,895	51.4%	$ 492,133	$ 1,394,180	-3.8%	$ (54,715)	
Total Unlimited GO Debt Srv Fund	$ 4,248,222	$ 3,868,737	-8.9%	$ 3,372,843	-12.8%	$ (495,894)	$ 3,167,295	-6.1%	$ (205,548)	
Capital Fund										
Real Estate Excise Tax Fund										
Supplies and Services	$ 39,528	$ 15,984	-59.6%	$ 257,010	1507.9%	$ 241,026	$ 264,720	3.0%	$ 7,710	
Capital	$ 6,106,738	$ 838,976	-86.3%	$ 5,375,000	540.7%	$ 4,536,024	$ 3,975,000	-26.0%	$ (1,400,000)	
Transfers to other funds	$ 1,251,688	$ 447,725	-64.2%	$ 2,320,745	418.3%	$ 1,873,020	$ 2,731,098	17.7%	$ 410,353	
Total Real Estate Excise Tax Fund	$ 7,397,954	$ 1,302,685	-82.4%	$ 7,952,755	510.5%	$ 6,650,070	$ 6,970,818	-12.3%	$ (981,937)	

	2021 Actual	2022 Projected	Change	2023 Budget	Annual % Change	2023 Change	2024 Budget	Annual % Change	2024 Change	Notes
Park Impact Fee Fund										
Capital	$ 4,690	$ 44,996	859.4%	$ 500,000	1011.2%	$ 455,004	$ -	-100.0%	$ (500,000)	
Transfers to other funds	$ 1,836,588	$ 843,491	-54.1%	$ 871,952	3.4%	$ 28,461	$ 844,056	-3.2%	$ (27,896)	Lacamas Lodge and North Shore Debt Service
Total Park Impact Fee Fund	$ 1,841,278	$ 888,487	-51.7%	$ 1,371,952	54.4%	$ 483,465	$ 844,056	-38.5%	$ (527,896)	
Transporation Impact Fee Fund										
Transfers to other funds	$ 1,007,786	$ 1,351,183	34.1%	$ 1,105,068	-18.2%	$ (246,115)	$ 1,355,146	22.6%	$ 250,078	Debt Service for Transportation and Lake and Sierra Intersection
Total Transportation Impact Fee Fund	$ 1,007,786	$ 1,351,183	34.1%	$ 1,105,068	-18.2%	$ (246,115)	$ 1,355,146	22.6%	$ 250,078	
Fire Impact Fee Fund										
Transfers to other funds		$ -		$ -			$ 870,927	100.0%	$ 870,927	Payment for Fire Apparatus
Total Fire Impact Fee Fund		$ -		$ -			$ 870,927	100.0%	$ 870,927	
NW 38th Ave Phase 3 Construction										
Capital	$ 416,801	$ 1,279,000	206.9%	$ 6,100,400	377.0%	$ 4,821,400	$ -	-100.0%	$ (6,100,400)	Construction of Phase 3 of 38th Ave.
Total NW 38th Ave Phase 3 Construction	$ 416,801	$ 1,279,000	206.9%	$ 6,100,400	377.0%	$ 4,821,400	$ -	-100.0%	$ (6,100,400)	
Facilities Capital Fund										
Capital	$ 19,796	$ 1,739,874	8689.0%	$ 4,533,883	160.6%	$ 2,794,009	$ 4,100,000	-9.6%	$ (433,883)	Facilities Assessment Priority Projects
Total Facilities Capital Fund	$ 19,796	$ 1,739,874	8689.0%	$ 4,533,883	160.6%	$ 2,794,009	$ 4,100,000	-9.6%	$ (433,883)	
Legacy Lands Project Fund										
Capital	$ 6,325,137	$ 500,000	100.0%	$ 150,000	-70.0%	$ (350,000)				Legacy Lands Master Plan
Total Legacy Lands Project Fund	$ 6,325,137	$ 500,000	100.0%	$ 150,000	-70.0%	$ (350,000)				
Enterprise Funds										
Storm Water Fund										
Salaries and Benefits	$ 687,411	$ 647,735	-5.8%	$ 943,862	45.7%	$ 296,127	$ 1,015,125	7.6%	$ 71,263	
Supplies and Services	$ 752,166	$ 776,998	3.3%	$ 900,027	15.8%	$ 123,029	$ 916,383	1.8%	$ 16,356	
Intergovernmental	$ 93,257	$ 54,234	-41.8%	$ 100,799	85.9%	$ 46,565	$ 103,218	2.4%	$ 2,419	
Capital	$ 631,911	$ 95,047	-85.0%	$ 550,000	478.7%	$ 454,953	$ 2,000,000	263.6%	$ 1,450,000	
Debt Service Payments	$ 26,352	$ 66,383	151.9%	$ 56,640	100.0%	$ (9,743)	$ 56,359	-0.5%	$ (281)	
Total Storm Water Fund	$ 2,191,097	$ 1,640,397	-25.1%	$ 2,551,328	55.5%	$ 910,931	$ 4,091,085	60.4%	$ 1,539,757	
Solid Waste Fund										
Salaries and Benefits	$ 492,549	$ 557,550	13.2%	$ 677,630	21.5%	$ 120,080	$ 724,089	6.9%	$ 46,459	
Supplies and Services	$ 2,062,760	$ 1,839,904	-10.8%	$ 2,143,193	16.5%	$ 303,289	$ 2,283,444	6.5%	$ 140,251	
Capital								100.0%	$ -	
Intergovernmental	$ 128,279	$ 131,652	2.6%	$ 131,119	-0.4%	$ (533)	$ 140,953	7.5%	$ 9,834	
Total Solid Waste Fund	$ 2,683,588	$ 2,529,106	-5.8%	$ 2,951,942	16.7%	$ 422,836	$ 3,148,486	6.7%	$ 196,544	
Water/Sewer Fund										
Salaries and Benefits	$ 2,720,329	$ 2,939,863	8.1%	$ 3,552,208	20.8%	$ 612,345	$ 3,816,661	7.4%	$ 264,453	
Supplies and Services	$ 4,702,694	$ 5,067,627	7.8%	$ 5,453,811	7.6%	$ 386,184	$ 5,556,947	1.9%	$ 103,136	
Intergovernmental	$ 559,788	$ 588,337	5.1%	$ 626,189	6.4%	$ 37,852	$ 641,217	2.4%	$ 15,028	
Capital	$ 633,779	$ 643,815	1.6%	$ 3,100,000	381.5%	$ 2,456,185	$ 7,100,000		$ 4,000,000	
Debt Service Payments	$ 1,792,656	$ 3,933,317	119.4%	$ 4,331,497	10.1%	$ 398,180	$ 4,326,186	-0.1%	$ (5,311)	Debt Service Schedules
Transfers to other funds	$ 261,273	$ 1,025,294	292.4%	$ 262,353	-74.4%	$ (762,941)	$ 28,173	-89.3%	$ (234,180)	
Total Water/Sewer Fund	$ 10,670,519	$ 14,198,253	33.1%	$ 17,326,058	22.0%	$ 3,127,805	$ 21,469,184	23.9%	$ 4,143,126	
W/S Capital Projects Fund										
Capital	$ 577,534	$ 1,480,000	156.3%	$ 1,210,000	-18.2%	$ (270,000)	$ 8,500,000	602.5%	$ 7,290,000	
Total W/S Capital Projects	$ 577,534	$ 1,480,000	156.3%	$ 1,210,000	-18.2%	$ (270,000)	$ 8,500,000	602.5%	$ 7,290,000	
North Shore Sewer Construction Project										
Capital	$ 209,569	$ 420,503	100.7%	$ -	-100.0%	$ (420,503)		-100.0%	$ -	Lacamas Creek Pump Station, WWTP Gravity Thickener Project
Total North Shore Construction	$ 209,569	$ 420,503	100.7%	$ -	-100.0%	$ (420,503)	$ -	-100.0%	$ -	

2019 Water Construction Projects

	2021 Actual	2022 Projected	Change	2023 Budget	Annual % Change	2023 Change	2024 Budget	Annual % Change	2024 Change	Notes
Capital	$ 1,286,642	$ 1,860,000	44.6%	$ -	-100.0%	$ (1,860,000)	$ -	#DIV/0!	$ -	
Total2019 Water Construction Projects	$ 1,286,642	$ 1,860,000	44.6%	$ -	-100.0%	$ (1,860,000)	$ -	-100.0%	$ -	
Water/Sewer Capital Reserve Fund										
Transfers to other funds	$ -	$ -		$ 1,150,000	100.0%	$ 1,150,000	$ 8,500,000	639.1%	$ 7,350,000	
Total Water/Sewer Cap. Fund	$ -	$ -		$ 1,150,000	100.0%	$ 1,150,000	$ 8,500,000	639.1%	$ 7,350,000	
Water/Sewer Bond Reserve Fund										
Transfers to other funds	$ -	$ -	0.0%	$ -	0.0%	$ -	$ -	0.0%	$ -	
Total Water/Sewer Bond Res. Fund	$ -	$ -	0.0%	$ -	0.0%	$ -	$ -	0.0%	$ -	
Internal Support Funds										
Equipment Rental Fund										
Salaries and Benefits	$ 510,927	$ 582,732	14.1%	$ 632,409	8.5%	$ 49,677	$ 671,655	6.2%	$ 39,246	Mechanic FTE
Supplies and Services	$ 893,340	$ 588,594	-34.1%	$ 700,317	19.0%	$ 111,723	$ 717,124	2.4%	$ 16,807	Improvements, Technology and Equipment
Capital	$ 507,932	$ 52,825	-89.6%	$ 2,055,318	3790.8%	$ 2,002,493	$ 581,632	-71.7%	$ (1,473,686)	Replacement Schedule
Total Equipment Rental Fund	$ 1,912,199	$ 1,224,151	-36.0%	$ 3,388,044	176.8%	$ 2,163,893	$ 1,970,411	-41.8%	$ (1,417,633)	
Reserve Funds										
Firefighter's Pension Fund										
Professional Services	$ -	$ 3,500	100.0%	$ 3,546	1.3%	$ 46	$ 3,631	2.4%	$ 85	
Transfers to other funds	$ 81,898	$ 76,896	-6.1%	$ 89,299	16.1%	$ 12,403	$ 91,537	2.5%	$ 2,238	
Total Firefighters's Pension Fund	$ 81,898	$ 80,396	-1.8%	$ 92,845	15.5%	$ 12,449	$ 95,168	2.5%	$ 2,323	
Retiree Medical Benefits Fund										
Salary and Benefits	$ 149,982	$ 152,145	1.4%	$ 156,709	3.0%	$ 4,564	$ 161,411	3.0%	$ 4,702	
Total Retiree Medical Fund	$ 149,982	$ 152,145	1.4%	$ 156,709	3.0%	$ 4,564	$ 161,411	3.0%	$ 4,702	
LEOFF 1 Disability Board										
Salary and Benefits	$ 169,437	$ 191,445	13.0%	$ 217,593	100.0%	$ 26,148	$ 230,648	6.0%	$ 13,055	
Total LEOFF 1 Disability Fund	$ 169,437	$ 191,445	13.0%	$ 217,593	100.0%	$ 26,148	$ 230,648	6.0%	$ 13,055	

City of Camas
Recommended General Fund Expenditure Budget Summary for 2022-2023

	2021 Actual	2022 Projected	Change	2023 Budget	Annual % Change	2023 Change	2024 Budget	Annual % Change	2024 Change	Notes
Legislative										
Salaries and Benefits	$ 189,841	$ 240,355	26.6%	$ 258,497	7.5%	$ 18,142	$ 273,153	5.7%	$ 14,656	Full staffing in 2022
Supplies and Services	$ 67,270	$ 75,562	12.3%	$ 16,458	-78.2%	$ (59,104)	$ 16,841	2.3%	$ 383	Municode & Coding error for CA
Total Legislative	$ 257,111	$ 315,917	22.9%	$ 274,955	-13.0%	$ (40,962)	$ 289,994	5.5%	$ 15,039	
Judicial										
Salaries and Benefits	$ 234,100	$ 216,085	-7.7%	$ 241,830	11.9%	$ 25,745	$ 256,613	6.1%	$ 14,783	Bailiff converted to prof srvs
Supplies and Services	$ 152,355	$ 186,512	22.4%	$ 166,686	-10.6%	$ (19,826)	$ 170,686	2.4%	$ 4,000	Security Upgrades delayed to 2022
Intergovernmental	$ 85,197	$ 96,628	13.4%	$ 99,623	3.1%	$ 2,995	$ 102,014	2.4%	$ 2,391	County costs remain status quo
Total Judicial	$ 471,652	$ 499,225	5.8%	$ 508,139	1.8%	$ 8,914	$ 529,313	4.2%	$ 21,174	
Executive										
Salaries and Benefits	$ 388,064	$ 303,800	-21.7%	$ 638,851	110.3%	$ 335,051	$ 692,326	8.4%	$ 53,475	CA to be filled 2023
Supplies and Services	$ 228,465	$ 533,459	133.5%	$ 97,212	-81.8%	$ (436,247)	$ 99,473	2.3%	$ 2,261	Comm Survey, Fac Study, CA contract
Intergovernmental	$ -	$ 22,052	10.0%	$ 22,736	3.1%	$ 684	$ 23,281	2.4%	$ 545	Community Outreach
Total Executive	$ 616,529	$ 859,311	39.4%	$ 758,799	-11.7%	$ (100,512)	$ 815,080	7.4%	$ 56,281	
Finance										
Salaries and Benefits	$ 1,131,902	$ 1,337,665	18.2%	$ 1,806,338	35.0%	$ 468,673	$ 1,926,570	6.7%	$ 120,232	Additional Staffing, backfill
Supplies and Services	$ 236,274	$ 825,571	249.4%	$ 430,805	-47.8%	$ (394,766)	$ 404,292	-6.2%	$ (26,513)	ERP contract costs
Intergovernmental	$ 65,761	$ 77,000	17.1%	$ 79,387	3.1%	$ 2,387	$ 81,292	2.4%	$ 1,905	State Auditor Increases
Total Finance	$ 1,433,937	$ 2,240,236	56.2%	$ 2,316,530	3.4%	$ 76,294	$ 2,412,154	4.1%	$ 95,624	
Legal										
Supplies and Services	$ 199,493	$ 261,104	30.9%	$ 269,198	3.1%	$ 8,094	$ 275,659	2.4%	$ 6,461	Contract increases and travel
Total Legal	$ 199,493	$ 261,104	30.9%	$ 269,198	3.1%	$ 8,094	$ 275,659	2.4%	$ 6,461	
Human Resources										
Salaries and Benefits	$ 175,872	$ 278,456	58.3%	$ 451,203	62.0%	$ 172,747	$ 345,906	-23.3%	$ (105,297)	Staff Allocation/Sal Adj Placeholder
Supplies and Services	$ 42,437	$ 130,120	206.6%	$ 256,382	97.0%	$ 126,262	$ 137,535	-46.4%	$ (118,847)	Benefit/Buyout Adj Placeholder
Total Human Resources	$ 218,309	$ 408,576	87.2%	$ 707,585	73.2%	$ 299,009	$ 483,441	-31.7%	$ (224,144)	
Administrative Services										
Salaries and Benefits	$ 158,477	$ 183,127	15.6%	$ 314,361	71.7%	$ 131,234	$ 332,815	5.9%	$ 18,454	New Position
Supplies and Services	$ 100,502	$ 196,653	95.7%	$ 146,437	-25.5%	$ (50,216)	$ 149,937	2.4%	$ 3,500	Furniture
Intergovernmental	$ 38,318	$ 65,100	69.9%	$ 52,307	-19.7%	$ (12,793)	$ 53,563	2.4%	$ 1,256	Clark County costs for Elections
Total Administrative Services	$ 297,297	$ 444,880	49.6%	$ 513,105	15.3%	$ 68,225	$ 536,315	4.5%	$ 23,210	
Law Enforcement										
Salaries and Benefits	$ 4,719,630	$ 5,142,056	9.0%	$ 6,117,414	19.0%	$ 975,358	$ 6,864,480	12.2%	$ 747,066	New staffing
Supplies and Services	$ 660,910	$ 720,966	9.1%	$ 1,097,620	52.2%	$ 376,654	$ 1,124,229	2.4%	$ 26,609	Equipment contracts
Intergovernmental	$ 277,014	$ 263,369	-4.9%	$ 254,615	-3.3%	$ (8,754)	$ 260,726	2.4%	$ 6,111	SWAT/CRESA Costs

	2021 Actual	2022 Projected	Change	2023 Budget	Annual % Change	2023 Change	2024 Budget	Annual % Change	2024 Change	Notes
Capital	$ 1,422	$ -		$ -	100.0%	$ -	$ -	-100.0%	$ -	
Total Law Enforcement	$ 5,658,976	$ 6,126,391	8.3%	$ 7,469,649	21.9%	$ 1,343,258	$ 8,249,435	10.4%	$ 779,786	12
Detention and Correction										
Salaries and Benefits	$ 92,641	$ 91,333	-1.4%	$ 78,990	-13.5%	$ (12,343)	$ 84,206	6.6%	$ 5,216	
Supplies and Services	$ 23,810	$ 22,618	-5.0%	$ 39,157	73.1%	$ 16,539	$ 40,117	2.5%	$ 960	
Intergovernmental	$ 164,167	$ 262,520	59.9%	$ 178,068	-32.2%	$ (84,452)	$ 219,941	23.5%	$ 41,873	Jail Costs
Total Detention and Correction	$ 280,618	$ 376,471	34.2%	$ 296,215	-21.3%	$ (80,256)	$ 344,264	16.2%	$ 48,049	
Information Services										
Salaries and Benefits	$ 506,995	$ 746,855	47.3%	$ 1,124,177	50.5%	$ 377,322	$ 1,200,685	6.8%	$ 76,508	New Staffing
Supplies and Services	$ 476,891	$ 471,331	-1.2%	$ 530,926	12.6%	$ 59,595	$ 523,177	-1.5%	$ (7,749)	Contract increases
Capital	$ -			$ 1,350,924	100.0%	$ 1,350,924		-100.0%	$ (1,350,924)	IT Upgrades, Security, Phone Sys
Total Information Services	$ 983,886	$ 1,218,186	23.8%	$ 3,006,027	146.8%	$ 1,787,841	$ 1,723,862	-42.7%	$ (1,282,165)	
Engineering										
Salaries and Benefits	$ 1,466,861	$ 1,543,476	5.2%	$ 2,185,129	41.6%	$ 641,653	$ 2,506,163	14.7%	$ 321,034	New Staffing
Supplies and Services	$ 123,439	$ 146,862	19.0%	$ 235,420	60.3%	$ 88,558	$ 241,071	2.4%	$ 5,651	Increase in insurance
Total Engineering	$ 1,590,300	$ 1,690,338	6.3%	$ 2,420,549	43.2%	$ 730,211	$ 2,747,234	13.5%	$ 326,685	
Community Development										
Salaries and Benefits	$ 250,331	$ 278,002	11.1%	$ 502,034	80.6%	$ 224,032	$ 543,204	8.2%	$ 41,170	Retirement & Fill vacant position
Supplies and Services	$ 5,530	$ 505,618	9043.2%	$ 200,799	-60.3%	$ (304,819)	$ 134,405	-33.1%	$ (66,394)	ERP Costs
Total Community Development	$ 255,861	$ 783,620	206.3%	$ 702,833	-10.3%	$ (80,787)	$ 677,609	-3.6%	$ (25,224)	
Planning										
Salaries and Benefits	$ 551,485	$ 361,215	-34.5%	$ 560,371	55.1%	$ 199,156	$ 597,020	6.5%	$ 36,649	Vacant Position Filled
Supplies and Services	$ 162,353	$ 268,188	65.2%	$ 361,806	34.9%	$ 93,618	$ 362,930	0.3%	$ 1,124	Comp Plan
Intergovernmental	$ 102,177	$ 110,078	7.7%	$ 113,490	3.1%	$ 3,412	$ 116,214	2.4%	$ 2,724	
Total Planning	$ 816,015	$ 739,481	-9.4%	$ 1,035,667	40.1%	$ 296,186	$ 1,076,164	3.9%	$ 40,497	
Animal Control										
Supplies and Services	$ -	$ -		$ 185	100.0%	$ 185	$ 189	2.2%	$ 4	
Intergovernmental	$ 54,602	$ 132,000	141.7%	$ 136,092	3.1%	$ 4,092	$ 139,358	2.4%	$ 3,266	New Humane Soc Contract
Total Animal Control	$ 54,602	$ 132,000	141.7%	$ 136,277	3.2%	$ 4,277	$ 139,547	2.4%	$ 3,270	
Parks and Recreation										
Salaries and Benefits	$ 448,021	$ 484,524	8.1%	$ 631,596	30.4%	$ 147,072	$ 670,124	6.1%	$ 38,528	
Supplies and Services	$ 303,250	$ 445,122	46.8%	$ 618,719	39.0%	$ 173,597	$ 518,707	-16.2%	$ (100,012)	Parks Comp Plan
Total Parks and Recreation	$ 751,271	$ 929,646	23.7%	$ 1,250,315	34.5%	$ 320,669	$ 1,188,831	-4.9%	$ (61,484)	
Parks Maintenance										
Salaries and Benefits	$ 790,070	$ 835,662	5.8%	$ 900,229	7.7%	$ 64,567	$ 971,427	7.9%	$ 71,198	Additional Staffing
Supplies and Services	$ 547,745	$ 488,154	-10.9%	$ 950,247	94.7%	$ 462,093	$ 850,173	-10.5%	$ (100,074)	
Intergovernmental	$ 5,280	$ 15,759	100.0%	$ 10,669	-32.3%	$ (5,090)	$ 10,925	2.4%	$ 256	
Capital	$ 55,242	$ 399,000	622.3%	$ 125,000	-68.7%	$ (274,000)	$ 75,000	-40.0%	$ (50,000)	

		2021 Actual		2022 Projected	Change		2023 Budget	Annual % Change		2023 Change		2024 Budget	Annual % Change		2024 Change	Notes
Total Parks Maintenance	$	1,398,337	$	1,738,575	24.3%	$	1,986,145	14.2%	$	247,570	$	1,907,525	-4.0%	$	(78,620)	

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Building																
Salaries and Benefits	$	788,105	$	802,628	1.8%	$	899,346	12.1%	$	96,718	$	956,310	6.3%	$	56,964	New Staffing
Supplies and Services	$	184,914	$	183,999	-0.5%	$	386,368	110.0%	$	202,369	$	389,497	0.8%	$	3,129	Credit Card fees,training, tools
Total Building	$	973,019	$	986,627	1.4%	$	1,285,714	30.3%	$	299,087	$	1,345,807	4.7%	$	60,093	
Central Services																
Salaries and Benefits	$	152,580	$	225,556	47.8%	$	251,649	11.6%	$	26,093	$	268,595	6.7%	$	16,946	New and reallocated staffing
Supplies and Services	$	172,542	$	240,020	39.1%	$	210,502	-12.3%	$	(29,518)	$	212,248	0.8%	$	1,746	Addressing maintenance issues
Total Central Services	$	325,122	$	465,576	43.2%	$	462,151	-0.7%	$	(3,425)	$	480,843	4.0%	$	18,692	
Library																
Salaries and Benefits	$	1,168,888	$	1,267,010	8.4%	$	1,382,001	9.1%	$	114,991	$	1,468,056	6.2%	$	86,055	Positions filled
Supplies and Services	$	547,834	$	466,849	-14.8%	$	682,397	46.2%	$	215,548	$	548,774	-19.6%	$	(133,623)	Repairs, furnishings, carpet, shelves
Capital	$	174,969	$	169,985	0.0%	$	133,882	-21.2%	$	(36,103)	$	767,095	473.0%	$	633,213	Learning Bee Hive
Total Library	$	1,891,691	$	1,903,844	0.6%	$	2,198,280	15.5%	$	294,436	$	2,783,925	26.6%	$	585,645	
Support to Other Funds																
Transfers to Other Funds	$	6,578,427	$	7,409,898	12.6%	$	9,270,240	25.1%	$	1,860,342	$	9,632,646	3.9%	$	362,406	Firefighters, Street Preservation
Total Support to Other Funds	$	6,578,427	$	7,409,898	12.6%	$	9,270,240	25.1%	$	1,860,342	$	9,632,646	3.9%	$	362,406	
TOTAL GENERAL FUND	**$**	**25,052,453**	**$**	**29,529,902**	**17.9%**	**$**	**36,868,373**	**24.9%**	**$**	**7,338,471**	**$**	**37,639,648**	**2.1%**	**$**	**771,275**	

City of Camas Recommended 2023-2024 Revenue Budget

Fund	Taxes	Licenses & Permits	Inter-governmental Revenue	Charges For Services	Fines & Forfeits	Misc. Revenue	Other Financing Sources	Interfund Transfers	Beginning Fund Balance	Total	
General Government Operations											
General Fund	**$ 47,733,580**	**$ 2,506,149**	**$ 1,494,581**	**$ 12,094,253**	**$ 251,671**	**$ 773,272**	**$**	**$ 5,609,226**	**$ 13,983,314**	**$ 84,446,046**	-
Special Revenue											
Street Fund			1,144,565	-		24,660		8,187,802	2,106,931	11,463,958	-
ARPA Fund						75,001			6,236,616	6,311,617	-
Tree Fund		-			-	204			15,580	15,784	-
Camas/Washougal Fire and EMS	5,292,069	245,906	1,202,580	14,626,619	24,420	36,335	-	12,642,712	1,888,019	35,958,660	-
Lodging Tax	47,277					751			59,634	107,662	-
Cemetery				168,505		3,110		400,000	295,904	867,519	-
Sub Total	**5,339,346**	**245,906**	**2,347,145**	**14,795,124**	**24,420**	**140,061**	**-**	**21,230,514**	**10,602,684**	**- 54,725,200**	
Debt Service											
Unlimited G.O. Bond Debt Service	-								-	-	
Limited G.O. Bond Debt Service								6,540,138	-	6,540,138	-
Sub Total	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**6,540,138**	**-**	**6,540,138**	
Capital Projects											
Real Estate Excise Tax Capital	8,291,431		212,000			295,177	1,750,000	175,000	15,047,340	25,770,948	-
Park Impact Fee Capital				4,367,507		196,784			3,851,009	8,415,300	-
Transportation Impact Fee Capital				2,527,412		63,708		-	3,662,476	6,253,596	-
Fire Impact Fee				525,470		18,982			1,249,588	1,794,040	-
NW 38th Ave Phase 3 Construction			4,886,400				1,214,000	-	-	6,100,400	-
Facilities Capital Fund			-				7,000,000	1,633,883	1,502,473	10,136,356	
Legacy Lands Project			-			10,443			5,915,535	5,925,978	
						-					
Sub Total	**8,291,431**	**-**	**5,098,400**	**7,420,389**	**-**	**585,094**	**9,964,000**	**1,808,883**	**31,228,422**	**64,396,619**	
Enterprise											
Storm Water Utility			-	4,364,448		83,636		32,798	3,178,724	7,659,606	-
City Solid Waste				6,731,582		50,989		102,958	4,019,129	10,904,658	-
Water-Sewer				31,683,426		525,746		203,883	14,868,540	47,281,595	-
Water-Sewer Capital Projects							-	9,710,000	-	9,710,000	-
North Shore Sewer Construction Project						-			245,340	245,340	
2019 Water Construction Projects								-	6,236,979	6,236,979	
Water-Sewer Capital Reserve				5,560,114		237,942	-	-	16,177,490	21,975,546	-
Water-Sewer Bond Reserve						10,747			1,724,690	1,735,437	
Sub Total	**-**	**-**	**-**	**48,339,570**	**-**	**909,060**	**-**	**10,049,639**	**46,450,892**	**105,749,161**	
Internal Support											
Equipment Rental				**4,601,331**		**23,051**			**2,587,762**	**7,212,144**	-
Reserves											
Firefighter's Pension						17,679			1,140,609	1,158,288	$ -
Retiree Medical						102		317,009	13,371	330,482	-
LEOFF 1 Disablity Board						7,036		348,241	526,778	882,055	-
Sub Total	**-**	**-**	**-**	**-**	**-**	**24,817**	**-**	**665,250**	**1,680,758**	**2,370,825**	
Total	**$ 61,364,357**	**$ 2,752,055**	**$ 8,940,126**	**$ 87,250,667**	**$ 276,091**	**$ 2,455,355**	**$ 9,964,000**	**$ 45,903,650**	**$ 106,533,832**	**$ 325,440,133**	
								(966)			

City of Camas Recommended 2023-2024 Expenditure Budget

Fund	Salaries & Wages	Personnel Benefits	Supplies	Other Services & Charges	Inter-governmental Services/Taxes	Interfund Transfers	Debt Service	Capital Outlay	Total	Ending Fund Balance	
General Government Operations											
General Fund	$ **27,272,377**	$ **11,029,603**	$ **1,245,078**	$ **11,651,877**	$ **1,954,302**	$ **18,902,886**	$ **-**	$ **2,451,901**	$ **74,508,024**	$ **9,938,022**	-
Special Revenue											
Street Fund	1,251,342	541,491	178,220	2,615,238	82,172	383,879		2,759,732	7,812,074	3,651,884	-
ARPA Fund						6,311,617			6,311,617	-	-
Tree Fund				-					-	15,784	
Camas/Washougal Fire and EMS	21,765,789	6,321,888	831,800	3,741,428	365,452	85,880		1,988,854	35,101,091	857,569	-
Lodging Tax				65,000					65,000	42,662	-
Cemetery	163,655	117,125	15,360	218,870				75,000	590,010	277,509	-
Sub Total	**23,180,786**	**6,980,504**	**1,025,380**	**6,640,536**	**447,624**	**6,781,376**	**-**	**4,823,586**	**49,879,792**	**4,845,408**	
Debt Service											
Unlimited G.O. Bond Debt Service									-	-	
Limited G.O. Bond Debt Service							6,540,138		6,540,138	-	-
Sub Total							**6,540,138**		**6,540,138**	**-**	
Capital Projects											
Real Estate Excise Tax Capital				521,730		5,051,843		9,350,000	14,923,573	10,847,375	-
Park Impact Fee Capital				-		1,716,008		500,000	2,216,008	6,199,292	-
Transportation Impact Fee Capital						2,460,214			2,460,214	3,793,382	-
Fire Impact Fee						870,927			870,927	923,113	-
NW 38th Ave Phase 3 Construction								6,100,400	6,100,400	-	-
Facilities Capital Fund								8,633,883	8,633,883	-	-
Legacy Lands Project								150,000	150,000	5,786,839	-
Sub Total	**-**	**-**	**-**	**521,730**	**-**	**10,098,992**	**-**	**24,734,283**	**35,355,005**	**27,550,001**	
Enterprise											
Storm Water Utility	1,322,789	636,199	71,298	1,745,112	204,016		112,999	2,550,000	6,642,413	1,017,193	-
City Solid Waste	897,956	503,761	96,183	4,330,456	272,072				6,100,428	4,804,230	-
Water-Sewer	5,164,874	2,203,996	1,950,069	9,060,689	1,267,406	290,526	8,657,683	10,200,000	38,795,243	8,486,353	1
Water-Sewer Capital Projects								9,710,000	9,710,000	-	-
North Shore Sewer Construction Project								-	-	245,340	
2019 Water Construction Projects								-	-	6,236,979	
Water-Sewer Capital Reserve						9,650,000			9,650,000	12,325,546	-
Water-Sewer Bond Reserve										1,735,437	
Sub Total	**7,385,619**	**3,343,956**	**2,117,550**	**15,136,257**	**1,743,494**	**9,940,526**	**8,770,682**	**22,460,000**	**70,898,084**	**34,851,078**	
Internal Support											
Equipment Rental	**908,081**	**395,982**	**171,416**	**1,246,026**				**2,636,950**	**5,358,455**	**1,853,689**	-
Reserves											
Firefighter's Pension		7,177				180,836			188,013	970,275	-
Retiree Medical		318,120							318,120	12,362	-
LEOFF 1 Disablity Board		448,241							448,241	433,814	-
Sub Total	**-**	**773,538**	**-**	**-**	**-**	**180,836**	**-**	**-**	**954,374**	**1,416,451**	
Total	$ **58,746,863**	**22,523,583**	**4,559,424**	**35,196,426**	**4,145,420**	**45,904,616**	**15,310,820**	**57,106,720**	**243,493,872**	**80,008,473**	

Item 8.

Fund Dec Pckg #	Ranking	Dept Package	Personnel	Tools & Equipment	Repairs & Maintenance	Professional Services	Training (Misc)	
			FULL BIENNIUM COSTS					
General								
14	1	Records Specialist	$ 180,000					
02	1	Fingerprinting Replacement		$ 11,000				
03	1	2 Overhire Positions	$ 515,000					incl eqpmt, bonus, training
10	1	Support Specialist	$ 210,000					
09	1	System Administrator	$ 310,500					
11	1	Training					$ 20,000	one-time
21	1	Project Manager	$ 241,738					
04	2	2 Police Sergeants	$ 605,000					incl eqpmt, bonus, training
20	2	Development Engineering Mgr	$ 350,000					
27	2	Operations Project Manager	$ 28,131					
24	2	Open Space Management Plan				$ 100,000		possible grants
25	2	Noxious Weed Abatement			$ 180,000			
13	3	Volunteer Coordinator	$ 180,000					
26	3	Parks/Trails Surface Treatment			$ 60,000			
01	4	Drone Program		$ 15,000			$ 5,000	15k one-time/5k on-going
12	4	Infotech Subscription				$ 44,030		one-time
19	4	Downtown Subarea Plan				$ 425,000		one-time
22	4	Recreation Specialist	$ 131,636					
16	4	Shelving		$ 14,000				one-time
15	4	Youth Literacy Programming				$ 50,000		
17	5	Part Time Library Associate	$ 62,416					
18	5	Increase Digital Materials				$ 36,000		
28	5	Increase Small Tools & Equip		$ 20,000				
		General Fund Total	$ 2,814,421	$ 60,000	$ 240,000	$ 655,030	$ 25,000	**$3,794,451**
Streets								
27	2	Operations Project Manager	$ 28,131					
	2	Local Road Safety Plan Update				$ 50,000		one-time
25	2	Noxious Weed Abatement			$ 20,000			
30	3	Additional Maint Workers (2)	$ 336,000					
31	3	Downtown Tree Replacement			$ 100,000			
32	4	Downtown Revitalization Design			$ 100,000			
33	4	Increase Seasonal to FTE	$ 168,000			$ (50,000)		
28	5	Increase Small Tools & Equip		$ 20,000				
		Street Fund Total	$ 364,131	$ -	$ 220,000	$ 50,000	$ -	**$634,131**
CWFD								
05	1	Stn 42 Pressure Relief Valve			$ 30,000			possible water fund support
07	1	Administrative Staffing (2)	$ 427,768	$ 72,000				incl eqpmt, training, vehicles
08	2	3-Person Engine Staffing (12)	$ 2,974,200	$ 120,000			$ 120,000	incl eqpmt, training
06	4	1929 Fire Truck Repairs			$ 15,000			
		CWFD Fund Total	$ 3,401,968	$ 192,000	$ 30,000	$ -	$ 120,000	**$3,743,968**
Cemetery								
29	4	Increase Seasonal to FTE	$ 168,000			$ (50,000)		incl benefits
		Cemetery Fund Total	$ 168,000	$ -	$ -	$ (50,000)	$ -	**$118,000**
Storm								
	1	Wetland Mitigation Monitoring				$ 190,000		2 pckg - 105k & 85k
36	1	Treatment Cartridge/Filter Replc			$ 50,000			
28	5	Increase Small Tools & Equip		$ 20,000				
34	3	Maintenance Workers (2)	$ 336,000					
35	4	Seasonal Workers (2)				$ 100,000		
27	2	Operations Project Manager	$ 75,020					
37	3	Full System Survey (Storm/Sewer)				$ 50,000		
		Storm Water Fund Total	$ 411,020	$ 20,000	$ 50,000	$ 340,000	$ -	**$821,020**
Solid Waste								
28	5	Increase Small Tools & Equip		$ 20,000				
		Solid Waste Fund Total	$ -	$ 20,000	$ -	$ -	$ -	**$20,000**
Water								
42	2	Maintenance Worker - Locating	$ 168,000					
27	2	Operations Project Manager	$ 75,020					
	4	Treatment Oper/Source Control	$ 168,000					
41	2	Cross Connection Ctrl Spec	$ 200,000					
28	5	Increase Small Tools & Equip		$ 20,000				
43	3	Hydrant Maintenance Program			$ 100,000			
		Water Total	$ 611,020	$ 20,000	$ 100,000	$ -	$ -	**$731,020**
Sewer								
38	3	Sewer Lead	$ 232,000					
27	2	Operations Project Manager	$ 75,020					
	3	Maintenance Worker - STEP	$ 168,000					
40	2	Maintenance Worker - Locating	$ 168,000					
39	2	WWTP Lab Technician	$ 200,000					
28	5	Increase Small Tools & Equip		$ 20,000				
37	3	Full System Survey (Storm/Sewer)				$ 50,000		
		Sewer Total	$ 843,020	$ 20,000	$ -	$ 50,000	$ -	**$913,020**
TOTAL			**$ 8,613,580**	**$ 332,000**	**$ 640,000**	**$ 1,045,030**	**$ 145,000**	**$10,775,610**
			80%	3%	6%	10%	1%	
								one-time: 11%
								on-going: 89%

Item 8.

Capital Program 2023-2024 Budget Program - 09/12/2022

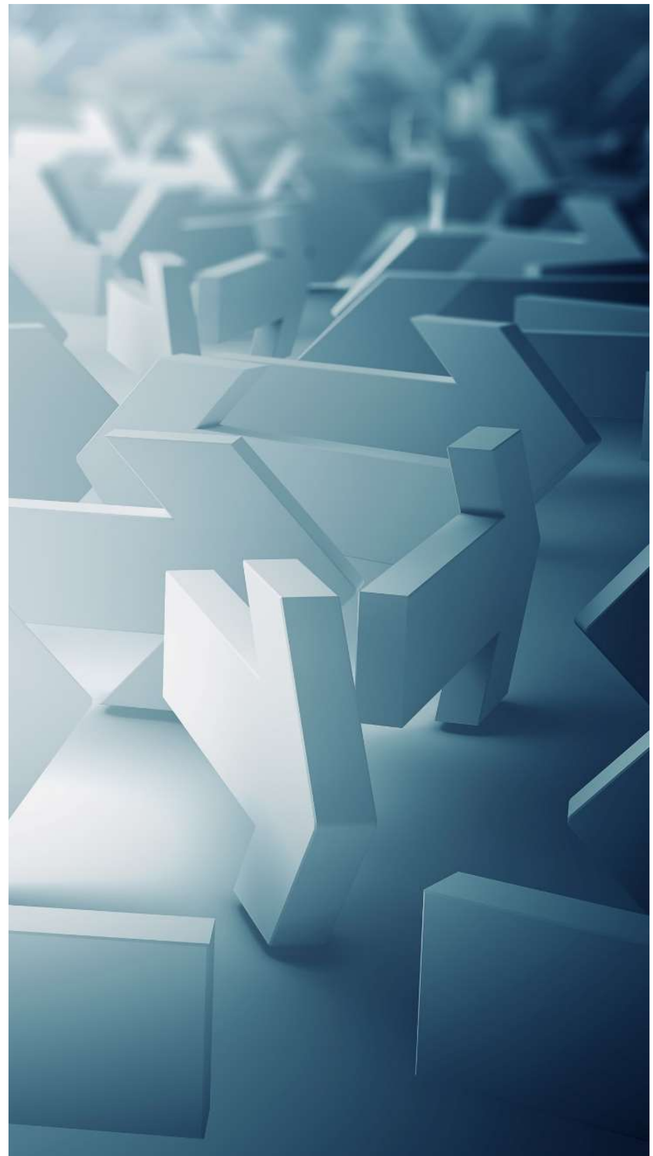
2023-2024 SOURCES OF FUNDING

#	Department /Fund	Rank	Title	2023	2024	Total	General	Streets	ARPA	CWFD	TIF	PIF	FIF	REET 1	REET 2	Legacy Lands	Cap Facilities	Vehicle R&R	Grants/ Contributions	Debt	Storm Water	Solid Waste	Water	Sewer	SDC
1	General Govt.	1	Police Interview Room Camera System	$ 27,000	$ 27,000	$ 54,000			$ 54,000																
2	General Govt.	3	Police Fleet In-Car Camera System	$ 26,520	$ 26,520	$ 53,040			$ 53,040																
3	General Govt.	1	Citywide Major Building Maintenance	$ 600,000	$ 600,000	$ 1,200,000								$ 1,200,000											
4	General Govt.	2	IT - Cyber Security, Threat Mgmt & Detection	$ 60,000		$ 60,000	$ 35,699	$ 1,589		$ 4,615											$ 1,607	$ 4,780	$ 6,343	$ 5,366	
5	General Govt.	1	IT - Microsoft Office 365 Licensing	$ 416,163		$ 416,163	$ 247,610	$ 11,021		$ 32,012											$ 11,149	$ 33,152	$ 43,999	$ 37,221	
6	General Govt.	1	IT - Network Equipment Replacements	$ 389,761		$ 389,761			$ 389,761																
7	General Govt.	1	IT - Phone System Replacement	$ 485,000		$ 485,000			$ 485,000																
8	General Govt.	4	Library Children's Learning Hive		$ 630,000	$ 630,000			$ 610,000										$ 20,000						
9	General Govt.	4	Library Flooring Replacement	$ 165,383		$ 165,383											$ 165,383								
10	General Govt.	1	Library Lighting Replacement	$ 175,000		$ 175,000											$ 175,000								
11	General Govt.	4	Library Furniture	$ 150,000		$ 150,000											$ 150,000								
12	General Govt.	1	Library Security System	$ 93,500		$ 93,500											$ 93,500								
13	General Govt.	4	Cemetery Access/Road Improvements	$ 100,000		$ 100,000		$ 100,000																	
14	General Govt.	1	Cemetery Columbarium/Niche Wall	$ 37,500	$ 37,500	$ 75,000			$ 75,000																
15	Streets/Capital	1	Pavement Preservation	$ 957,302	$ 1,002,430	$ 1,959,732		$ 1,959,732																	
16	Streets/Capital	1	ADA Upgrades	$ 125,000	$ 125,000	$ 250,000		$ 100,000						$ 150,000											
17	Streets/Capital	2	NW 38th Avenue Phase 3 - Construction	$ 6,100,400		$ 6,100,400													$ 1,886,400	$ 4,214,000					
18	Streets/Capital	3	NW Lake & Sierra Signal Improvements	$ 100,000	$ 500,000	$ 600,000					$ 600,000														
19	Streets/Capital	2	NW 14th Avenue CDBG Project	$ 475,000		$ 475,000		$ 88,000											$ 212,000				$ 175,000		
20	CWFD	1	Breathing Apparatus Refilling System	$ 108,000		$ 108,000			$ 108,000																
21	CWFD	1	Vehicle Extraction Tool Replacement	$ 88,000		$ 88,000			$ 88,000																
22	CWFD	1	Replacement Fire Engines		$ 870,927	$ 870,927							$ 870,927												
23	CWFD	1	Replacement Fire Engines		$ 870,927	$ 870,927								$ 870,927											
24	CWFD	1	Fire Station 43 Replacement	$ 9,400,000		$ 9,400,000														$ 9,400,000					
25	CWFD	1	Fire Station 41 HQ Replacement	$ 13,900,000		$ 13,900,000														$ 13,900,000					
26	CWFD	1	Ambulance Gurney Upfit	$ 51,000		$ 51,000			$ 51,000																
27	Parks	4	Open Space/Parks/Trails	$ 250,000	$ 250,000	$ 500,000									$ 500,000										
28	Parks	1	Field Drainage Improvements	$ 75,000	$ 75,000	$ 150,000	$ 150,000																		
29	Parks	1	Restroom/Dug Out Structures Rehab	$ 50,000		$ 50,000	$ 50,000																		
30	Parks	2	Crown Park Improvements Phase 1 & 2	$ 3,150,000	$ 3,150,000	$ 6,300,000														$ 6,300,000					
31	Parks	4	T-3 (East Lake) Trail	$ 500,000		$ 500,000						$ 500,000													
32	Parks	2	South Lacamas Creek Trailhead	$ 1,100,000		$ 1,100,000									$ 1,100,000										
33	Parks	4	Bike Park Design & Construction	$ 325,000		$ 325,000									$ 325,000										
34	Parks	4	Legacy Lands Master Planning	$ 150,000		$ 150,000										$ 150,000									
35	Parks	1	Sports Field Assessment & Planning	$ 60,000		$ 60,000	$ 60,000																		
36	Parks	4	Pool Planning	$ 75,000	$ 75,000	$ 150,000	$ 150,000																		
37	Parks	1	Community Center Planning	$ 60,000		$ 60,000											$ 60,000								
38	Stormwater	3	Upper Dam Gate Replacement	$ 250,000		$ 250,000															$ 250,000				
39	Stormwater	1	Columbia Summit Retrofit	$ 200,000	$ 2,000,000	$ 2,200,000															$ 2,200,000				
40	Stormwater	1	Fargo Street Pipeline Upsize/Detention - Design	$ 100,000		$ 100,000															$ 100,000				
41	PW/Water	1	Washougal Wellfield Improvements	$ 500,000		$ 500,000																			$ 500,000
42	PW/Water	4	Boulder Parallel Intake Line - Design		$ 350,000	$ 350,000																			$ 350,000
43	PW/Water	1	Crown Road Booster Station Upgrade	$ 250,000	$ 1,000,000	$ 1,250,000																			$ 1,250,000
44	PW/Water	2	Well/Reservoir Site Security Upgrades	$ 300,000		$ 300,000																			$ 300,000
45	PW/Water	1	Northshore Water Transmission Main	$ 100,000	$ 2,000,000	$ 2,100,000																			$ 2,100,000
46	PW/Water	4	Gregg Reservoir Siting Analysis		$ 200,000	$ 200,000																			$ 200,000
47	PW/Water	1	Hathaway Road Replacement - Design/Constr	$ 30,000	$ 300,000	$ 330,000																	$ 330,000		
48	PW/Water	1	NE 43rd/Franklin Replacement - Design/Constr	$ 30,000	$ 500,000	$ 530,000																	$ 530,000		
49	PW/Water	1	SE 6th Ave Bridge Crossing - Construction		$ 1,500,000	$ 1,500,000																	$ 1,500,000		
50	PW/Water	1	Water Repair & Replacement	$ 500,000	$ 500,000	$ 1,000,000																	$ 1,000,000		
51	PW/Sewer	1	Pump Station Telemetry Upgrades		$ 1,800,000	$ 1,800,000																			$ 1,800,000
52	PW/Sewer	1	STEP Main Assessment and Cleaning		$ 850,000	$ 850,000																		$ 850,000	
53	PW/Sewer	1	WWTP Upgrades	$ 1,000,000	$ 5,000,000	$ 6,000,000																			$ 6,000,000
54	PW/Sewer	1	Gravity Sewer Upgrades	$ 1,000,000	$ 1,000,000	$ 2,000,000																			$ 2,000,000
55	PW/Sewer	2	Pump Station Repair & Replacement	$ 650,000	$ 650,000	$ 1,300,000																		$ 1,300,000	
56	Equipmt Rent	4	Parks & Recreation Sprinter Van	$ 60,000		$ 60,000	$ 60,000																		
57	Equipmt Rent	1	Operations Center Mezzanine Expansion	$ 100,000		$ 100,000												$ 100,000							
58	Equipmt Rent	4	4-ton diesel HMA hot box (Replacement)	$ 45,000		$ 45,000		$ 30,000													$ 5,000		$ 5,000	$ 5,000	
59	Equipmt Rent	3	Work Truck - Regular Duty (Streets FTE)	$ 41,000	$ 41,000	$ 82,000		$ 82,000																	
60	Equipmt Rent	4	Work Truck - Quad Cab (Parks)	$ 50,000		$ 50,000	$ 50,000																		
61	Equipmt Rent	3	Work Truck - Stake Bed/Tip (Storm FTE)	$ 79,000		$ 79,000															$ 79,000				
62	Equipmt Rent	4	Vehicle - SUV (Eng/Bldg - Remove Reserve)	$ 31,000	$ 31,000	$ 62,000	$ 62,000																		
63	Equipmt Rent	2	Vehicle - SUV (Water CCC Specialist FTE)	$ 31,000		$ 31,000																	$ 31,000		
64	Equipmt Rent	4	Vehicle - SUV (PW Admin)	$ 31,000		$ 31,000	$ 6,000	$ 5,000													$ 5,000	$ 5,000	$ 5,000	$ 5,000	
65	Equipmt Rent	1	Electric Manlift (Facilities)	$ 20,000		$ 20,000	$ 20,000																		
66	Equipmt Rent	3	Vehicle - STEP System Van (Sewer)	$ 75,000		$ 75,000																		$ 75,000	
67	Equipmt Rent	3	Vehicle - CCTV Van (Sewer, Storm)	$ 200,000		$ 200,000															$ 50,000			$ 150,000	
68	Equipmt Rent	3	Sewer Line Rapid Assessmt Tool (Sewer, Storm)	$ 30,000		$ 30,000															$ 15,000			$ 15,000	
69	Equipmt Rent	1	Operations Center Generator	$ 400,000		$ 400,000	$ 60,000	$ 55,000										$ 55,000			$ 55,000	$ 55,000	$ 60,000	$ 60,000	
70	Equipmt Rent	4	Ven-Trac Infield Attachment (Parks)	$ 10,000		$ 10,000	$ 10,000																		
				$ 45,938,529	$ 25,962,304	$ 71,900,833	$ 961,309	$ 2,432,342	$ 1,913,801	$ 36,627	$ 600,000	$ 500,000	$ 870,927	$ 2,220,927	$ 1,925,000	$ 150,000	$ 643,883	$ 155,000	$ 2,118,400	$ 33,814,000	$ 2,771,757	$ 97,931	$ 3,686,342	$ 2,502,587	$ 14,500,000

Matrix	CDP	Rank	Resource	Package Title	2023 Budget	2024 Budget	To[illegible]n
1	03	1	General Govt.	Police Interview Room Camera System	$ 27,000	$ 27,000	$ 54,000
3		1	General Govt.	Major Building Maintenance	$ 100,000	$ 100,000	$ 200,000
5	29	1	General Govt.	IT - Microsoft Office 365 Licensing	$ 416,163		$ 416,163
6	30	1	General Govt.	IT - Network Equipment Replacements	$ 389,761		$ 389,761
7	27	1	General Govt.	IT - Phone System Replacement	$ 485,000		$ 485,000
10	16	1	General Govt.	Library Lighting Replacement	$ 175,000		$ 175,000
12	18	1	General Govt.	Library Security System	$ 93,500		$ 93,500
14	32	1	General Govt.	Cemetery Columbarium/Niche Wall	$ 37,500	$ 37,500	$ 75,000
15		1	Streets/Capital	Pavement Preservation	$ 957,302	$ 1,002,430	$ 1,959,732
16	58	1	Streets/Capital	ADA Upgrades	$ 125,000	$ 125,000	$ 250,000
20	20	1	CWFD	Breathing Apparatus Refilling System	$ 108,000		$ 108,000
21	21	1	CWFD	Vehicle Extraction Tool Replacement	$ 88,000		$ 88,000
22	22	1	CWFD	Replacement Fire Engines		$ 870,927	$ 870,927
23	23	1	CWFD	Replacement Fire Engines		$ 870,927	$ 870,927
24	24	1	CWFD	Fire Station 43 Replacement	$ 9,400,000		$ 9,400,000
25	25	1	CWFD	Fire Station 41 HQ Replacement	$ 13,900,000		$ 13,900,000
26	26	1	CWFD	Ambulance Gurney Upfit	$ 51,000		$ 51,000
28	48	1	Parks	Field Drainage Improvements	$ 75,000	$ 75,000	$ 150,000
29	49	1	Parks	Restroom/Dug Out Structures Rehab	$ 50,000		$ 50,000
35	09	1	Parks	Sports Field Assessment & Planning	$ 60,000		$ 60,000
37	13	1	Parks	Community Center Planning	$ 60,000		$ 60,000
39	55	1	Stormwater	Columbia Summit Retrofit	$ 200,000	$ 2,000,000	$ 2,200,000
40	56	1	Stormwater	Fargo Street Pipeline Upsize/Detention - Design	$ 100,000		$ 100,000
41	70	1	PW/Water	Washougal Wellfield Improvements	$ 500,000		$ 500,000
43	63	1	PW/Water	Crown Road Booster Station Upgrade	$ 250,000	$ 1,000,000	$ 1,250,000
45	67	1	PW/Water	Northshore Water Transmission Main	$ 100,000	$ 2,000,000	$ 2,100,000
47	65	1	PW/Water	Hathaway Road Replacement - Design/Construction	$ 30,000	$ 300,000	$ 330,000
48	66	1	PW/Water	NE 43rd/Franklin Replacement - Design/Construction	$ 30,000	$ 500,000	$ 530,000
49	69	1	PW/Water	SE 6th Ave Bridge Crossing - Construction		$ 1,500,000	$ 1,500,000
50	68	1	PW/Water	Water Repair & Replacement	$ 500,000	$ 500,000	$ 1,000,000
51	52	1	PW/Sewer	Pump Station Telemetry Upgrades		$ 1,800,000	$ 1,800,000
52	53	1	PW/Sewer	STEP Main Assessment and Cleaning		$ 850,000	$ 850,000
53	54	1	PW/Sewer	WWTP Upgrades	$ 1,000,000	$ 5,000,000	$ 6,000,000
54	50	1	PW/Sewer	Gravity Sewer Upgrades	$ 1,000,000	$ 1,000,000	$ 2,000,000
57	36	1	Equipmt Rent	Operations Center Mezzanine Expansion	$ 100,000		$ 100,000
65	34	1	Equipmt Rent	Electric Manlift (Facilities)	$ 20,000		$ 20,000
69	35	1	Equipmt Rent	Operations Center Generator	$ 400,000		$ 400,000
					$ 30,828,226	**$ 19,558,784**	**$ 50,387,010**
4	28	2	General Govt.	IT - Cyber Security, Threat Mgmt & Detection	$ 60,000		$ 60,000
17	60	2	Streets/Capital	NW 38th Avenue Phase 3 - Construction	$ 6,000,000		$ 6,000,000
19	59	2	Streets/Capital	NW 14th Avenue CDBG Project	$ 475,000		$ 475,000
30	05	2	Parks	Crown Park Improvements Phase 1 & 2	$ 3,150,000	$ 3,150,000	$ 6,300,000
32	08	2	Parks	South Lacamas Creek Trailhead	$ 1,100,000		$ 1,100,000
44	71	2	PW/Water	Well/Reservoir Site Security Upgrades	$ 300,000		$ 300,000
55	51	2	PW/Sewer	Pump Station Repair & Replacement	$ 650,000	$ 650,000	$ 1,300,000
					$ 11,735,000	**$ 3,800,000**	**$ 15,535,000**
2	04	3	General Govt.	Police Fleet In-Car Camera System	$ 26,520	$ 26,520	$ 53,040
18	61	3	Streets/Capital	NW Lake & Sierra Signal Improvements	$ 100,000	$ 500,000	$ 600,000
38	57	3	Stormwater	Upper Dam Gate Replacement	$ 250,000		$ 250,000
66	39	3	Equipmt Rent	Vehicle - STEP System Van (Sewer)	$ 75,000		$ 75,000
67	38	3	Equipmt Rent	Vehicle - CCTV Van (Sewer, Storm)	$ 200,000		$ 200,000
68	37	3	Equipmt Rent	Sewer Line Rapid Assessment Tool (Sewer, Storm)	$ 30,000		$ 30,000
					$ 681,520	**$ 526,520**	**$ 1,208,040**
8	14	4	General Govt.	Library Children's Learning Hive		$ 630,000	$ 630,000
9	15	4	General Govt.	Library Flooring Replacement	$ 165,383		$ 165,383
11	17	4	General Govt.	Library Furniture	$ 150,000		$ 150,000
13	31	4	General Govt.	Cemetery Access/Road Improvements	$ 100,000		$ 100,000
31	10	4	Parks	T-3 (East Lake) Trail	$ 500,000		$ 500,000
33	12	4	Parks	Bike Park Design & Construction	$ 325,000		$ 325,000
34	06	4	Parks	Legacy Lands Master Planning	$ 150,000		$ 150,000
36	07	4	Parks	Pool Planning	$ 75,000	$ 75,000	$ 150,000
27		4	Parks	Open Space/Parks/Trails	$ 250,000	$ 250,000	$ 500,000
42	62	4	PW/Water	Boulder Parallel Intake Line - Design		$ 350,000	$ 350,000
46	64	4	PW/Water	Gregg Reservoir Siting Analysis		$ 200,000	$ 200,000
56	11	4	Equipmt Rent	Parks & Recreation Sprinter Van	$ 60,000		$ 60,000
58	33	4	Equipmt Rent	4-ton diesel HMA hot box (Replacement)	$ 45,000		$ 45,000
59	45/46	4	Equipmt Rent	Work Truck - Regular Duty (Streets FTE)	$ 41,000	$ 41,000	$ 82,000
60	44	4	Equipmt Rent	Work Truck - Quad Cab (Parks)	$ 50,000		$ 50,000
61	47	4	Equipmt Rent	Work Truck - Stake Bed/Tip (Storm FTE)	$ 79,000		$ 79,000
62	42	4	Equipmt Rent	Vehicle - SUV (Eng/Bldg - Remove Reserve)	$ 31,000	$ 31,000	$ 62,000

63	41	4	Equipmt Rent	Vehicle - SUV (Water CCC Specialist FTE)	$ 31,000		$ [illegible]
64	40	4	Equipmt Rent	Vehicle - SUV (PW Admin)	$ 31,000		$ 31,000
70	43	4	Equipmt Rent	Ven-Trac Infield Attachment (Parks)	$ 10,000		$ 10,000
					$ 2,093,383	**$ 1,577,000**	**$ 3,670,383**

Budget Engagement
2023 – 2024 Biennium



OCTOBER 5, 2022

CITY OF CAMAS
Finance Department

Overview

Balancing Act

As part of the suite of tools offered by Balancing Act, staff have access to *Prioritize*, a tool that allows participants to prioritize provided options. Staff used this tool to create two simulations for the community to engage with—one for capital project proposals and another for operating budget proposals.

The City simulations went live on August 23 and remained active until September 9.

In-Person Activities

In tandem with the online simulations, staff also engaged the public with a booth at the Farmer's Market located in front of City Hall. The booth had six options listed on colorful posters and asked the participants to choose which option was most important to them. They were then directed to place a colored ball that matched the color on the poster into the correspoding jar.

Capital options were taken to the market on August 24, operating options were taken on August 31, and ARPA funding was taken on September 14.

Engage Camas

Lastly, in tandem with the last Farmer's Market booth, ARPA funding options were presented on Engage Camas, allowing participants to rank the six options in order from most to least important to them.

The Engage Camas survey remained open until September xx.

Capital Options	Operating Options	ARPA Options
38th Avenue Project, Phase 3	Cemetery Staffing	Clark County Housing Assistance
Children's Library Learning Hive	Downtown Planning	Crown Park Improvements
Crown Park Improvements	Fire Staffing	Cemetery Columbarium
Fire Apparatus & Equipment	Parks Staffing	Fallen Leaf Picnic Shelter
Lake/Sierra Intersection Signal	Police Staffing	Fire Equipment Replacements
Legacy Lands Master Planning	Streets Staffing	Library Learning Hive
Library Refurbishments		
Police Camera Systems		
Pool Planning		
Sport Fields Improvements		
Street Preservation & ADA		
Trail Development		

Capital Scenario Results

Balancing Act

The capital scenario received 723 page views and 342 submissions, with 82.75% of participants reporting being a City resident, and 76.9% of responses from unique* IP addresses.

In the results below, the options presented to respondents appear in the prioritization order in which they were most frequently ranked. This ranking pattern is visible as a warmer band of color running diagonally from the top left corner to the bottom right corner.

	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Rank 7	Rank 8	Rank 9	Rank 10	Rank 11	Rank 12
Fire Apparatus & Equipment	106	40	33	26	24	21	16	15	9	5	2	3
Trail Development	28	33	41	32	34	25	16	20	16	14	10	5
Crown Park Improvements	49	24	22	27	25	18	23	11	17	14	18	7
Police Camera Systems	16	47	32	34	26	20	17	21	12	15	9	23
Street Preservation & ADA Upgrades	17	35	41	44	31	28	20	12	14	13	8	5
Sport Fields Improvements	30	18	17	19	26	25	23	22	19	23	16	22
Pool Planning	27	28	30	22	14	22	18	16	16	16	17	21
38th Avenue Project, Phase 3	14	15	22	15	17	19	19	25	30	30	22	19
Children's Library Learning Hive	24	18	17	14	23	26	20	20	20	20	21	7
Library Refurbishments	6	26	17	29	26	26	21	27	21	21	11	10
Lake/Sierra Intersection Signal	15	19	19	16	17	10	27	20	25	17	30	20
Legacy Lands Master Planning	9	15	14	16	16	23	27	30	23	17	27	22

**In an effort to determine the impact of responses from duplicate IP addresses, the results were also calculated using only unique IP address. The results were not statistically different, so the full results are presented here with duplicate IP addresses included. Duplicate IP addresses is not necessarily from an individual submitting multiple rankings, but could also result from users in the same household or business submitting responses.*

In-Person Activities

The first Farmer's Market booth received 250 "votes" from participants, and was intended to capture the input from all stakeholders—including children and non-residents. The engagement received praise from many participants, who appreciated that the City was listening to them. Many were appreciative that we were not only listening, but would be sharing the feedback with the Mayor and City Council Members.

CAPITAL OPTION	VOTES	PCT OF TOTAL
POOL PLANNING	73	29.2%
PARK & TRAIL DEVELOPMENT	69	27.6%
FIRE EQUIPMENT	37	14.8%
LIBRARY LEARNING HIVE	26	10.4%
POLICE CAMERAS	24	9.6%
ROADWDAY MAINTENANCE	21	8.4%
TOTAL PARTICIPANTS	**250**	

Operating Scenario Results

Balancing Act

The operating scenario received 678 page views and 182 submissions, with 68.13% of participants reporting being a City resident, and 74.17% of responses from unique* IP addresses.

In the results below, the options presented to respondents appear in the order of importance in which they were most frequently ranked. This ranking pattern is visible as a warmer band of color running diagonally from the top left corner to the bottom right corner.

	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Rank 7
Fire Staffing	108	26	7	22	9	9	0
Police Staffing and Technology	20	77	15	22	14	16	0
Downtown Improvements	15	9	26	30	53	14	4
Parks Staffing and Improvements	9	10	23	29	31	20	12
Street Staffing and Planning	10	7	27	19	23	18	17
Library Staffing and Enhancements	6	12	15	8	12	33	24
Cemetery Staffing	5	11	10	4	2	6	59

**In an effort to determine the impact of responses from duplicate IP addresses, the results were also calculated using only unique IP address. The results were not statistically different, so the full results are presented here with duplicate IP addresses included. Duplicate IP addresses is not necessarily from an individual submitting multiple rankings, but could also result from users in the same household or business submitting responses.*

In-Person Activities

At the second Farmer's Market booth 191 participants cast "votes". Staff again allowed all stakeholders to participate—including children and non-residents. Staff again received praise for giving the community a voice in budgeting.

CAPITAL OPTION	VOTES AS HIGHEST PRIORITY	PCT OF TOTAL
POLICE STAFFING	55	28.8%
PARKS STAFFING	35	18.3%
FIRE STAFFING	31	16.2%
LIBRARY STAFFING	30	15.7%
STREETS STAFFING	20	10.5%
DOWNTOWN PLANNING	20	10.5%
TOTAL PARTICIPANTS	**191**	

ARPA Scenario Results

Engage Camas

The operating scenario received 156 site visits and 94 contributions. 89 participants made an anonymous submission, and 2 registered.

In the results below, the options presented to respondents appear in the order of importance in which they were most frequently ranked. This ranking pattern is visible as a warmer band of color running diagonally from the top left corner to the bottom right corner.

Options	Average Rank
Fire Equipment Replacements	2.19
Crown Park Improvements	2.23
Children’s Library Learning Hive	3.37
Funding to Assist the Homeless	4.14
New Fallen Leaf Park Picnic Shelter	4.19
Cemetery Repairs	4.87

In-Person Activities

At the final Farmer's Market booth 153 participants cast "votes". Staff again allowed all stakeholders to participate—including children and non-residents.

CAPITAL OPTION	VOTES AS HIGHEST PRIORITY	PCT OF TOTAL
CROWN PARK PHASE 1&2	50	32.7%
HOMELESSNESS FUNDING	41	26.8%
LIBRARY LEARNING HIVE	24	15.7%
FIRE EQUIPMENT	22	14.4%
FALLEN LEAF PICNIC SHELTER	13	8.5%
CEMETERY COLUMBARIUM	3	2.0%
TOTAL PARTICIPANTS	**153**	