



CITY OF
TUMWATER

**PUBLIC WORKS COMMITTEE
MEETING AGENDA**

**Online via Zoom and In Person at
Tumwater City Hall, Council Conference
Room, 555 Israel Rd. SW, Tumwater, WA
98501**

**Thursday, May 21, 2026
11:00 AM**

1. Call to Order
2. Roll Call
- [3.](#) Approval of Minutes: Public Works Committee, April 23, 2026
- [4.](#) Resolution No. R2026-009, Six-Year Transportation Improvement Program (Transportation & Engineering Department)
- [5.](#) 2026 Drought Briefing (Water Resources & Sustainability Department)
6. Additional and Future Items
7. Adjourn

Meeting Information

All committee members will be attending remotely. The public are welcome to attend in person, by telephone or online via Zoom.

Watch Online

<https://us02web.zoom.us/j/86102342658?pwd=9OSAzdNIhfyGNJi8P4NhLDQfbLJGQD.1>

Listen by Telephone

Call (253) 215-8782, listen for the prompts and enter the Webinar ID 861 0234 2658 and Passcode 453321.

Public Comment

The public may submit comments by sending an email to council@ci.tumwater.wa.us, no later than 5:00 p.m. the day before the meeting. Comments are submitted directly to the Committee members and will not be read individually into the record of the meeting.

Post Meeting

Video of this meeting will be recorded and posted on our City Meeting page: <https://tumwater-wa.municodemeetings.com>.

Accommodations

The City of Tumwater takes pride in ensuring that people with disabilities are able to take part in, and benefit from, the range of public programs, services, and activities offered by the City. To request an accommodation or alternate format of communication, please contact the City's ADA Coordinator

directly, call (360) 754-4129 or email ADACoordinator@ci.tumwater.wa.us. For vision or hearing impaired services, please contact the Washington State Relay Services at 7-1-1 or 1-(800)-833-6384.

MEETING MINUTES



TUMWATER PUBLIC WORKS COMMITTEE
April 23, 2026

CONVENE: 11:00 a.m.

PRESENT: Chair Angela Jefferson and Councilmember Eileen Swarthout

Excused: Councilmember Meghan Sullivan

Staff: Assistant City Administrator Kelly Adams, Water Resources & Sustainability Department Director Dan Smith, Water Resources & Sustainability Department Deputy Director Tyle Zuchowski, Program Manager Patrick Soderberg, City Engineer Bill Lindauer, Water Resources Specialist Dave Kangiser, and Administrative Assistant Bonnie Hale

APPROVAL OF MINUTES: **Councilmember Swarthout moved, seconded by Councilmember Jefferson to approve the minutes of February 19, 2026 & March 5, 2026. A voice vote approved the motion.**

2026 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) UPDATE : Specialist Kangiser presented on the requirements of the National Pollutant Discharge Elimination System (NPDES) municipal stormwater permit administered by the Department of Ecology, a permit that the city renews every five years. Specialist Kangiser outlined the city’s strategy for meeting these requirements and reported that the city remains in compliance with the permit.

ACCEPTANCE OF BARNES LAKE MANAGEMENT DISTRICT BUDGET & WORK PLAN: Specialist Kangiser presented the new 2026 annual work plan and operating budget for the Barnes Lake Management District. He outlined the treatment plans scheduled for 2026 and other administrative tasks that the committee will do throughout the year. A new committee member has been elected, filling the final vacancy on the committee.

MOTION: Councilmember Jefferson moved, seconded by Councilmember Swarthout to place the Barnes Lake Management District (BLMD) 2026 Budget and Work Plan on the May 5, 2026, City Council consent calendar with a recommendation to approve.

RESOLUTION NO. R2026-005, RECEIPT AUTHORITY FOR THE WATER QUALITY COMBINED FINANCIAL ASSISTANCE AGREEMENT (WQC-2026-TUMWAT-00294) WITH THE DEPARTMENT OF ECOLOGY FOR THE TROSPER SEWER EXTENSION PROJECT: Deputy Director Zuchowski presented on Resolution No. R2026-005, receipt authority for the water quality combined financial assistance agreement with the Department of Ecology for the Trospers Road Sewer Extension Project. He outlined the primary drivers for this sewer extension as well as the city’s plans and timeline for the project. This resolution is a requirement for a loan from the Washington State Department of Ecology in the amount of \$5.25 million with an interest rate of 2.7% over a 30-year term to fund this extension.

MOTION: Councilmember Swarthout moved, seconded by Councilmember Jefferson to place Resolution No. R2026-005 Receipt Authority for the Water Quality Combined Financial Assistance Agreement with the Department of Ecology for the Trospers Sewer Extension Project on the May 5, 2026, City Council consent calendar with a recommendation to adopt.

ADDITIONAL ITEMS: Councilmember Jefferson requested a report on the Arbor Day event that took place on April 18, 2026. Director Smith said that the event went very well and he will coordinate with Manager Wood to gather specific information requested to report back to the Councilmembers.

ADJOURNMENT: With there being no further business, Councilmember Jefferson adjourned the meeting at 11:57 a.m.

Prepared by Bonnie Hale, Administrative Assistant

TO: Public Works Committee
 FROM: Jeff Cook, Deputy Director of Transportation & Engineering Department
 DATE: May 21, 2026
 SUBJECT: Resolution No. R2026-009 – Six Year Transportation Improvement Program

1) Recommended Action:

Place Resolution No. R2026-009 – Six Year Transportation Improvement Program on the June 2, 2026, City Council meeting for a public hearing and consideration with a recommendation to adopt.

2) Background:

RCW 35.77.010 requires that each city and town adopt, annually, following a public hearing, a Six-Year TIP detailing projected needs for city transportation improvements. Any project proposed for federal or state funding must be included in this program.

The proposed 2027-2032 TIP includes transportation projects included in the City’s Comprehensive Plans, including the Capital Facilities Plan, Transportation Plan, and Recreation and Open Space Plan. It also includes projects that have been identified since the aforementioned plans were adopted. Projects are based on projected growth and available or projected funding. The timelines identified may change depending on growth and the availability of funding.

3) Policy Support:

Strategic Priorities & Goals 2026-2032

- Create and Maintain a Transportation System Safe for all Modes of Travel
 - Ensure sustainable funding to maintain and improve streets and sidewalks
-

4) Alternatives:

- Approve the project list as presented
 - Recommend revisions to the project list.
-

5) Fiscal Notes:

Fiscal impacts of the Six-Year TIP will be identified through the ongoing budget and Capital Facilities Plan processes. Projected funding needs and sources are identified in the TIP.

6) Attachments:

- A. Resolution No. R2026-009
- B. 2027-2032 TIP Project Map
- C. 2027-2032 TIP List

**RESOLUTION NO. R2026-009
SIX-YEAR TRANSPORTATION IMPROVEMENT PROGRAM**

A RESOLUTION of the City Council of the City of Tumwater, Washington adopting a Six-Year Transportation Improvement Program for 2027-2032.

WHEREAS, RCW 35.77.010 requires that each city and town adopt annually, following a public hearing, a Six-Year Transportation Improvement Program detailing projected needs for street construction; and

WHEREAS, the Tumwater City Council held a public hearing on June 2, 2026, to consider the 2027-2032 Six-Year Transportation Improvement Program detailing projected needs for street construction; and

WHEREAS, the Six-Year Transportation Improvement Program is consistent with the Comprehensive Plan, supports the health, safety, and welfare of the residents of Tumwater, and will benefit the public;

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

Section 1. Adoption. The City of Tumwater’s Six-Year Transportation Improvement Program for 2026-2031, attached hereto as Exhibit “A”, is hereby adopted.

Section 2. Ratification. Any act consistent with the authority and prior to the effective date of this Resolution is hereby ratified and affirmed.

Section 3. Severability. The provisions of this Resolution are declared separate and severable. The invalidity of any clause, sentence, paragraph, subdivision, section, or portion of this Resolution or the invalidity of the application thereof to any person or circumstance, shall not affect the validity of the remainder of the Resolution, or the validity of its application to other persons or circumstances.

Section 4. Effective Date. This Resolution shall become effective immediately upon adoption and signature as provided by law.

RESOLVED this ___ day of _____, 2026.

CITY OF TUMWATER

APPROVED AS TO FORM:

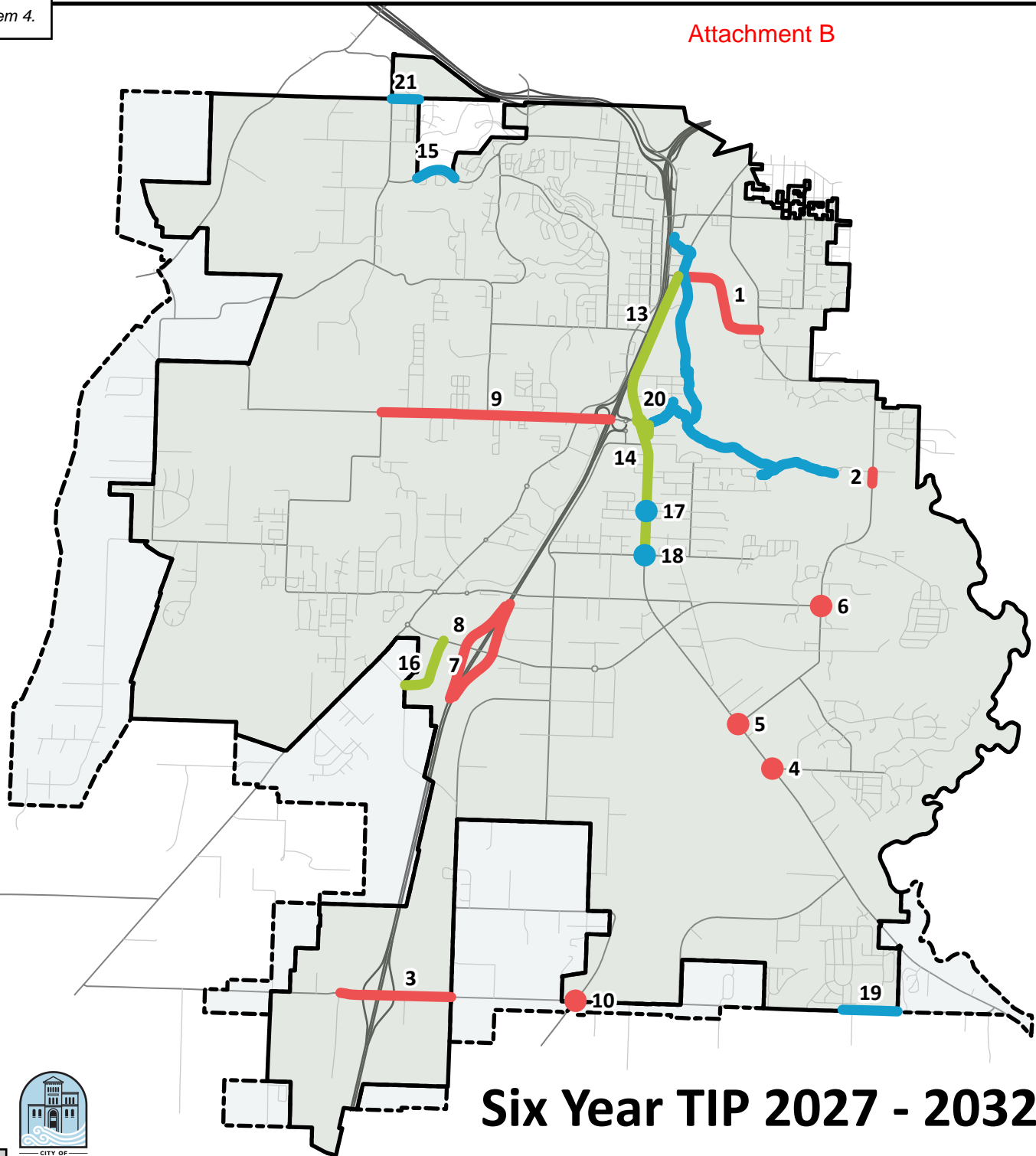
Leatta Dahlhoff, Mayor

Karen Kirkpatrick, City Attorney

ATTEST:

Melody Valiant, City Clerk

Attachment B



1. E St Connection
2. Henderson Boulevard - 58th Avenue to Bridge
3. I-5 & SR 121/93rd Avenue SE Interchange Study
4. Old Highway 99 & 79th Avenue Roundabout
5. Old Highway 99 & Henderson Boulevard Roundabout
6. Tumwater Boulevard and Henderson Boulevard Roundabout
7. Tumwater Boulevard Interchange Northbound On and Off-Ramps
8. Tumwater Boulevard Interchange Southbound On and Off-Ramps
9. Trospen Road Study (Kirsop Road to I-5)
10. 93rd Avenue and Case Road Roundabout
11. Pavement Maintenance Program (not shown on map)
12. "Missing Link" Transportation Improvements Program (not shown on map)
13. Capitol Boulevard Median Reconstruction
14. Capitol Boulevard Plan, Corridor Improvements
15. Somerset Hill Culvert Replacement
16. Tye Drive Extension, Tumwater Boulevard to Prine Drive
17. X Street Roundabout
18. Dennis Street Roundabout
19. 93rd Avenue, Tigerlilly Street to City Limits
20. Deschutes Valley Trail
21. Mottman Road Improvements
22. Multimodal Program Improvements (not shown on map)
23. Safe Routes to School Program (not shown on map)

- Capacity
- Multimodal
- City Limits
- Urban Growth Area
- Capacity
- Multimodal
- Preservation / Enhancement

Six Year TIP 2027 - 2032





Six Year Transportation Improvement Program Summary 2027 - 2032

Map #	Project Name	Phase in TIP*				Description	Fund Source / Project Cost (2025 dollars)			Funds Secured
		PLN	PE	RW	CN		Grant	Local	Total	
CAPACITY										
1	E Street Connection		X	X	X	New roadway and intersection improvements connecting Capitol Boulevard and Cleveland Avenue. Project is likely to be phased, overall project costs exceed \$50 million, funding shown is for design and property acquisition for the entire project and construction of a single phase.	\$ 7,000,000	\$ 1,000,000	\$ 8,000,000	No
2	Henderson Boulevard - 58th Avenue to Bridge	X	X	X		Shared use path bridge or widening of existing bridge over the Deschutes River to add multimodal improvements in addition to a roundabout at 58th Avenue / Pioneer Park driveway for traffic calming and capacity.	\$ 680,000	\$ 120,000	\$ 800,000	No
3	I-5 & SR 121/93rd Avenue SE Interchange Study	X				Examine capacity, safety, and multimobility issues and conduct an Intersection Control Evaluation, if applicable.	\$ 173,000	\$ 27,000	\$ 200,000	Yes
4	Old Highway 99 and 79th Avenue Roundabout			X	X	Roundabout at the intersection of Old Highway 99 and 79th Avenue.	\$ -	\$ 4,700,000	\$ 4,700,000	Yes
5	Old Highway 99 and Henderson Boulevard Roundabout		X			Roundabout at the intersection of Old Highway 99 and Henderson Boulevard.	\$ 450,000	\$ 450,000	\$ 900,000	No
6	Tumwater Boulevard and Henderson Boulevard Roundabout		X			Roundabout at the intersection of Tumwater Boulevard and Henderson Boulevard.	\$ 320,000	\$ 80,000	\$ 400,000	No
7	Tumwater Boulevard Interchange Northbound On and Off-Ramps				X	Roundabout at the northbound on / off ramp. This is phase 1 of 3 for the Tumwater Boulevard Interchange project. Local funding shown is primarily mitigation fees.	\$ 1,836,000	\$ 3,664,000	\$ 5,500,000	Partial
8	Tumwater Boulevard Interchange Southbound On and Off-Ramps		X		X	Roundabout at the southbound on / off ramp. This is phase 2 of 3 for the Tumwater Boulevard Interchange project. Local funding shown is primarily mitigation fees.	\$ 2,500,000	\$ 4,000,000	\$ 6,500,000	Partial
9	Trosper Road, Kirsop Road to Interstate 5	X				Improvements to address capacity, safety, and multimodal improvements on Trosper Road. Anticipated improvements include adding bike and pedestrian improvements and roundabouts at intersections with Littlerock Road and Tye Drive / Interstate 5 ramps. Project will be phased.	\$ 400,000	\$ 100,000	\$ 500,000	No
10	93rd Avenue and Case Road Roundabout		X	X		Roundabout at the intersection of 93rd Avenue and Case Road. This project is focused on capacity and partially funded by development mitigation funds.	\$ -	\$ 1,000,000	\$ 1,000,000	No

*PLN - Planning, PE - Design, RW - Right of Way, CN - Construction



Six Year Transportation Improvement Program Summary 2027 - 2032

Map #	Project Name	Phase in TIP*				Description	Fund Source / Project Cost (2025 dollars)			Funds Secured
		PLN	PE	RW	CN		Grant	Local	Total	
PRESERVATION / ENHANCEMENT / MAINTENANCE										
11	Pavement Maintenance Program	X	X		X	Maintenance and preservation of existing streets, including Transportation Benefit District projects.	\$ -	\$ 12,000,000	\$ 12,000,000	Partial
12	"Missing Link" Transportation Improvements Program		X	X	X	Infill, extend, or complete significant missing roadway segments, multimodal facilities, safety improvements, and other transportation infrastructure when it is unlikely development of associated properties will occur in the near term. Local funding shown includes development funding.	\$ 500,000	\$ 2,000,000	\$ 2,500,000	No
13	Capitol Boulevard Median Reconstruction		X		X	Reconstruction of a median on Capitol Boulevard from E Street to M Street to incorporate low water use/drought-tolerant landscaping and wider curbing for maintenance efficiency and safety.	\$ -	\$ 450,000	\$ 450,000	Yes
14	Capitol Boulevard Plan, Corridor Improvements		X	X	X	Implementation of various improvements prescribed in the Capitol Boulevard Corridor Plan. Includes right of way acquisition for properties in the alignment of a new street connecting Linda and Ruby Streets, design and construction of multimodal safety improvements, neighborhood traffic calming, and more.	\$ -	\$ 700,000	\$ 700,000	No
15	Somerset Hill Culvert Replacement		X		X	Replace a current partial fish passage barrier with a bridge. Project to include multimodal improvements.	\$ 4,000,000	\$ 300,000	\$ 4,300,000	Yes
16	Tyee Drive Extension, Tumwater Boulevard to Prine Drive		X	X	X	Extension of Tyee Drive from Tumwater Boulevard to Prine Drive. Project to be constructed and funded by private development, shown as local funding in this document. Project funding may also be determined by a development agreement.	\$ -	\$ 4,200,000	\$ 4,200,000	No

*PLN - Planning, PE - Design, RW - Right of Way, CN - Construction



Six Year Transportation Improvement Program Summary 2027 - 2032

Map #	Project Name	Phase in TIP*				Description	Fund Source / Project Cost (2025 dollars)			Funds Secured
		PLN	PE	RW	CN		Grant	Local	Total	
MULTIMODAL										
17	X Street Roundabout			X	X	Roundabout at the intersection of Capitol Boulevard and X Street. This project is focused on capacity and multimodal improvements.	\$ 2,941,000	\$ 1,959,000	\$ 4,900,000	Yes
18	Dennis Street Roundabout		X	X		Roundabout at the intersection of Capitol Boulevard and Dennis Street. This project is focused on capacity and multimodal improvements.	\$ 3,167,500	\$ 1,357,500	\$ 4,525,000	No
19	93rd Avenue, Tigerlilly Street to City Limits		X		X	Reconstruction of 93rd Avenue to accommodate bike lanes and sidewalk in addition to lowering the roadway at a large hill to improve site distance for safety. Funding assumes a development agreement with expected development on abutting properties.	\$ -	\$ 3,000,000	\$ 3,000,000	No
20	Deschutes Valley Trail		X		X	Paved walking/bicycling trail connection from Tumwater Historical Park to Pioneer Park. Project will be constructed in five separate phases; Segment A1 - Tumwater Historical Park to Brewery Park (complete), Segment A2 - Brewery Park to E Street, Segment B - E Street to Tumwater Valley Golf Course, Segment C - Tumwater Valley Golf Course to Deschutes Valley Park, Segment D - Deschutes Valley Park to Pioneer Park. Project is both multimodal capacity.	\$ 10,000,000	\$ 6,650,000	\$ 16,650,000	Partial
21	Mottman Road Improvements		X		X	Multimodal and street improvements on portions of Mottman Road. This is a joint project with the City of Olympia.	\$ 1,900,000	\$ 100,000	\$ 2,000,000	Yes
22	Multimodal Improvements Program	X	X	X	X	Multimodal improvements throughout the City. Work includes sidewalk maintenance, repair, infill, ramps, pedestrian crossings and connections, bicycle improvements, shoulder widening, and traffic calming.	\$ 2,900,000	\$ 1,200,000	\$ 4,100,000	Partial
23	Safe Routes to School Program		X		X	Improve pedestrian and bicyclist safety near schools. Projects include sidewalks, lighting, flashing beacons, signage, markings, and other measures.	\$ 500,000	\$ 500,000	\$ 1,000,000	No
Totals							\$ 39,267,500	\$ 49,557,500	\$ 88,825,000	

*PLN - Planning, PE - Design, RW - Right of Way, CN - Construction



Six Year Transportation Improvement Program Summary 2027 - 2032

Map #	Project Name	Phase in TIP*				Description	Fund Source / Project Cost (2025 dollars)			Funds Secured
		PLN	PE	RW	CN		Grant	Local	Total	
Projects being removed										
18	2nd Avenue Pedestrian and Bicycle Improvements				X	Construction of a roundabout at the intersection of 2nd Avenue and Linwood Avenue and multimodal improvements on 2nd Avenue from B Street to Linwood Avenue.	\$ 2,115,000	\$ 1,685,000	\$ 3,800,000	Yes
23	Percival Creek Fish Passage Barrier Removal				X	Replacement of a full barrier culvert with a four-sided box culvert. Includes roadway reconstruction and the addition of bike lanes and sidewalks.	\$ 2,000,000	\$ 400,000	\$ 2,400,000	Yes

*PLN - Planning, PE - Design, RW - Right of Way, CN - Construction

TO: Public Works Committee
FROM: Carrie Gillum, Senior Water Resources Specialist
DATE: May 21, 2026
SUBJECT: 2026 Drought Briefing

1) Recommended Action:

No action requested, this is informational only.

2) Background:

Each year, the Water Resources & Sustainability Department (WRS) completes a drought assessment for the city. The assessment reviews local conditions and uses state and national climate datasets to forecast drought severity during the peak water-demand season. For summer 2026, models indicate above-average temperatures and below-average rainfall in the region. The Washington Department of Ecology has also issued a statewide drought declaration for the fourth year in a row.

As in prior years, WRS recommends implementing Stage 1 of the city’s Water Shortage Response Plan (WSRP), the lowest stage. The WSRP includes triggers that can escalate response actions through Stage 4 (Emergency Curtailment). During the peak water demand season (generally July 1–September 15), WRS monitors daily water production and consumption. Due to drier-than-normal conditions this year, monitoring will begin May 18.

If conditions indicate a need to reduce water use, the city’s greatest near-term impact is likely to come from temporarily limiting irrigation at parks, facilities, and rights-of-way. Staff will provide an overview of current conditions, WSRP stages, and the monitoring conducted throughout the peak demand period.

3) Policy Support:

- City of Tumwater Water Shortage Response Plan – 2019 Update
 - WAC 246-290-100 (Water System Plan)
 - Tumwater Municipal Code, 13.04.170
-

4) Alternatives:

None, no action required

5) Fiscal Notes:

None, no action required.

6) Attachments:

- A. 2026 Drought Assessment Memo
- B. 2019 Water Shortage Response Plan

MEMO



Date: April 22, 2026
To: Steve Craig, Operations Manager
Cory Hale, Assistant Utilities Operations Manager
From: Carrie Gillum, Senior Water Resources Specialist
CC: Dan Smith, Water Resources & Sustainability Director
Patrick Soderberg, Program Manager
Mike Erickson, Water Lead
Curt Shields, Water Quality Lead

2026 Drought Assessment – Stage 1: Advisory.

Summary

This is the annual drought outlook assessment for the city. In this memo, spring environmental conditions and future outlooks for Tumwater are assessed to determine what actions should be taken prior to summer.

The Washington Department of Ecology (DOE) has announced a drought emergency declaration through April 7, 2027 for all of Washington state. The declaration was due to low snowpack and multiyear compounding deficits in precipitation, from the 2023, 2024, and 2025 droughts.

The winter snowpack was 48 to 57% below the normal peak median across Tumwater's two drainage basins. This is due to the warm temperatures experienced during the winter which as not contributing to snowpack. Regular precipitation is down over six inches from normal since the start of the calendar year. Rainfall was above average between October 1 and April 1. Precipitation outlook for the next three months is below normal with temperatures above normal.

Most monitoring and production well water levels had decreased from the previous year and the three-year average, except for the Palermo wellfield. Wells had deeper water levels as much as seven feet. All other wells showed little change from the year before. Water level stability is likely due to the above average precipitation.

Conditions for the 2026 summer demands are to be the same as 2025 based on review from spring demands.

Continued monitoring of water levels, production, and consumption will be necessary. Other stressors, such as a heat dome effect or mechanical failure in the system, will also need to be monitored to determine if any additional conservation measures are needed. Water Resources & Sustainability (WRS)

will implement voluntary reduction measures (stage 1 of the Water Shortage Response Plan) to conservatively meet summer demands and meet our water conservation goals.

Public outreach will be crucial so that peak demands on the water system can be controlled. Implementation of social media and e-newsletters should begin by mid-May and continue through the summer season. The focus may be on irrigation systems and how to properly set watering times. Additionally, more emphasis on rain sensors, so there is no watering while it is raining, could help reduce peak water use in summer.

Review and Analysis

Data from the start of the water year, October 1, 2025 through April 1, 2026 were reviewed for the following:

- Local rainfall – Olympia Airport
- Regional Rainfall – PRISM Climate Group
- Regional Snowpack – National Weather and Climate Center
- Groundwater Elevations – City of Tumwater monitoring network and production wells, Thurston County monitoring network, and USGS monitoring network
- Streamflow – USGS WaterWatch
- Water Consumption and Production – City of Tumwater
- Drought Monitoring and Forecast – DOE, NWS Climate Prediction Center, US Drought Monitor.

Conclusions

Full data assessment is here, [2026 Drought Assessment Full](#).

From review of the data above, the following conclusions were made:

- Winter and spring rainfall was above normal. Snowpack was substantially below the median by 53-61%. Even though Tumwater’s drinking water sources are not directly dependent on snowfall, the lack of snowfall in the region could have some effect on the regional recharge of groundwater reserves.
- Groundwater levels observed in monitoring and production wells stayed about the same as last year, except for the Readiness well (shallower by 5.7 feet) and Well 17 (deeper by 7.2 feet). This indicates some groundwater storage recovery due to the above average rainfall since October.
- Spring consumption in 2026 was about the same as 2025. It is expected that summer demand may be about the same.

	March water consumption in gallons	% difference to previous year	June 1 - September 30 produced in gallons	% difference to previous year
2026	73,390,437	-0.3%	-	-

2025	73,634,000	7.3%	579,721,544	3%
2024	70,988,000	-6.9%	562,535,000	-10.3%
2023	76,244,000	9.6%	626,997,000	8.3%

- The drought outlook for Tumwater in the next six months is forecasting abnormally dry with below normal precipitation and above normal temperatures.
- Drought outlooks across various agencies are inconsistent. The US Drought Monitor is neutral for drought in the Tumwater area through June 30. However, the NWS Climate Prediction Center outlook is showing above average temperatures and below average precipitation for April through June. Modeling through September 2026 completed by the European Centre for Medium-Range Weather Forecast (ECMWF) predicts warmer and wetter weather. Temperature increase is consistent with all outlooks but differs on precipitation.
- The DOE has announced a drought emergency declaration as of April 8, 2026 and will extend until April 7, 2027. This declaration is statewide due to low snowpack and multiyear compounding deficits in precipitation, from the 2023, 2024, and 2025 droughts.

Water Shortage Response Plan Action Recommendations

The following are steps that will be taken:

- As we do every spring, the city will prepare to implement Stage 1 of the Water Shortage Response Plan. Stage 1 encourages voluntary conservation through public outreach and is the lowest level of drought concern. Focus should be on irrigation with the promotion of proper landscape watering practices and use of smart irrigation controllers with sensors either for soil moisture or rainfall.

The city has already implemented Facebook posts of water conservation messaging including a link to the city conservation incentives and rebates page. Additionally, the quarterly One Water newsletter includes water conservation content, and utility bill inserts with messaging is sent at least once a year in the spring. The annual Water Quality Report will be printed and delivered to all customers in May and include water conservation messaging and incentives and rebates with webpage link.
- Additional avenues of outreach should be explored including possible face-to-face community opportunities, use of the Johnson box on electronic utility billing, and other electronic media.
- Requesting large users of irrigation water to decrease watering is suggested prior to increasing the water shortage stage. This includes city parks and facilities, schools, and other governmental agencies. This has been used in the past with success in reducing peak demands.
- Once the Port wells are online, or before June 1st, WRS staff will determine the present possible production (P3) value for our water system. This will determine the trigger stages for

our water shortage response plan and help us identify if there is a need to implement further water-saving measures.

- Between June 1 and September 30, WRS staff will track production water volumes and periodically review climatic conditions throughout the spring/summer so that we can stay informed about potential impacts to our water system.
- If production water volumes exceed P3 triggers, conservation stages will be increased accordingly.

City of Tumwater

Water Shortage Response Plan

2019 Update

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BACKGROUND

The objective of the Water Shortage Response Plan (WSRP) is to aid decision making in the event of a water shortage. The WSRP identifies demand reduction measures available to the City and defines circumstances that may trigger their implementation. Many of the City's water utility programs support the goals of the WSRP by increasing the resilience of our water system. These programs help to avert a major supply disruption and include preventative maintenance, water system planning, wellhead protection, and water use efficiency.

A water shortage can be described as any situation in which the water supply is insufficient to meet demand. A shortage may occur for a number of reasons and may be predictable or unpredictable. The types of events that could lead to a water shortage include the following:

- Predictable
 - Summer demand increase
 - Planned water system repair or maintenance
- Unpredictable
 - Mechanical failure
 - System contamination
 - Well or aquifer contamination
 - Major water main break
 - Earthquake
 - Fire
 - Vandalism or sabotage

The WSRP provides a framework that should be tailored to meet the specific needs of a water shortage. While the WSRP is designed to take into account as many scenarios as possible, there will be events or circumstances that can't be anticipated. It's the goal of the WSRP to maintain essential public health and safety services, and minimize adverse impacts on the local economy and the environment.

ANTICIPATING A WATER SHORTAGE

To avert or respond to a water shortage City staff need to monitor environmental and infrastructure conditions that could disrupt the water supply.

ENVIRONMENTAL CONDITIONS

The Washington Department of Ecology maintains a thorough list of resources for assessing the potential for seasonal water shortages. This list can be found at the following link:

<http://www.ecy.wa.gov/programs/wr/ws/wtrsupply.html>

Table 1 shows additional websites that are useful for assessing environmental conditions that could contribute to a water shortage.

Table 1: Useful Websites for Assessing Water Shortage Conditions

Indicator	Organization	Website	Comments
General	Department of Ecology	ecy.wa.gov/programs/wr/supply/	
Groundwater	USGS Groundwater Watch	groundwaterwatch.usgs.gov	See site number 465033122570202
	Thurston County Monitoring Data	thurstoncountywa.gov/sw/Pages/monitoring-dashboard.aspx	
Drought Conditions	National Integrated Drought Information Center	drought.gov	
	National Drought Mitigation Center	droughtmonitor.unl.edu	
	NWS Climate Prediction Center: Drought Information	www.cpc.ncep.noaa.gov/products/Drought/	
Streamflow	USGS WaterWatch	waterwatch.usgs.gov	See site number 12080010
Snowpack	NRCS National Water and Climate Center	www.wcc.nrcs.usda.gov/snow/	
Climate	NWS Climate Prediction Center: Three Month Outlook	www.cpc.ncep.noaa.gov/products/predictions/long_range/seasonal.php?lead=1	
	NWS Climate Services	http://w2.weather.gov/climate/	Recent weather data for Olympia Airport
	PRISM Climate Group	prism.oregonstate.edu/	Historical climate data

In addition to the external data sources listed above, data from the City's monitoring and production wells (water levels, specific capacity, etc.) can be useful for assessing environmental conditions that might suggest an imminent water shortage. While our groundwater supplies are generally protected from short-term drought conditions, periods of sustained drought can impact water levels which have the potential to reduce well production capacities.

Using the environmental indicators described above, staff can forecast the ability of the water utility to meet summer demand. City staff should begin monitoring environmental conditions in February or March in anticipation of the yearly summer demand spike.

INFRASTRUCTURE CONDITIONS

The City of Tumwater operates 11 groundwater wells. Three of these wells (wells 9, 10 and 11) are typically only used in the summer months while the rest are used year-round. Table 2 shows the percentage of monthly production that each well provided from January thru September 2017.

Table 2: Percentage of Monthly Production for Each City Well.

Well Field	Well	January - May	June - September
Palermo	Well 4	7%	6%
	Well 6	8%	6%
	Well 8	6%	5%
	Well 16	6%	5%
	Well 17	6%	5%
Port	Well 9	0%	6%
	Well 10	0%	2%
	Well 11	0%	3%
	Well 15	6%	11%
Bush	Well 12	14%	12%
	Well 14	49%	40%

City staff monitor specific capacity annually at production wells to identify when a well requires rehabilitation. When capacity declines noticeably the City will investigate rehabilitation. In addition to specific capacity, staff should regularly assess well yield, pump limitations, and other operational conditions that could reduce well production.

CUSTOMER PORTFOLIO AND DEMAND CYCLE

Demand patterns are addressed in detail in the 2019 Water System Plan. The information provided below is meant to provide context for the WSRP. As of July 2017 the City of Tumwater has approximately 7,900 active service connections. The vast majority (84%) of these accounts are residential with institutional, commercial, and industrial (ICI) accounts making up the second largest category. Residential and ICI accounts are also the largest users of water, making up nearly 80% of all the consumption in the City. Table 3 shows the full summary of the main account types and their associated consumption.

Table 3: Water Consumption by Account Type

Account Type	Percent Active Accounts	Percent Total Consumption
Mobile Home Parks	0.1%	1.2%
Fill Stations & Hydrant Meters	1.2%	0.3%
Multi-Family	2.5%	8.6%
Irrigation	3.1%	11.2%
ICI	8.6%	35.9%
Residential	84.5%	42.8%

Every summer water consumption increases dramatically. From 2014 to 2016 monthly average consumption during the non-irrigation season (October – May) averaged 90,000 ccf compared to an average of 167,000 ccf during the irrigation season (June – September). Maximum day demand (MDD) is the highest 24-hour demand that occurs in a calendar year. MDD generally occurs on or near the

warmest day of the year, or within a prolonged period of warm, dry weather in July or August. For forecasting purposes, MDD can be estimated by multiplying average day demand ADD by 2.04, the City’s current peaking factor as described in the 2019 Water System Plan. Table 4 below shows MDD and date of MDD for 2012-2017.

Table 4: Maximum Day Demand 2012 - 2017

	2012	2013	2014	2015	2016	2017
Maximum Day Demand (mgd)	5.969	5.396	5.758	6.975	5.933	6.8
Date of Maximum Day	8/16	8/19	8/11	7/8	8/15	8/2

In 2017 the MDD occurred on August 2nd after the 3-day average temperature reached 93 degrees. The Figure 1 illustrates demand fluctuations over the summer 2017 which are typical for the City.

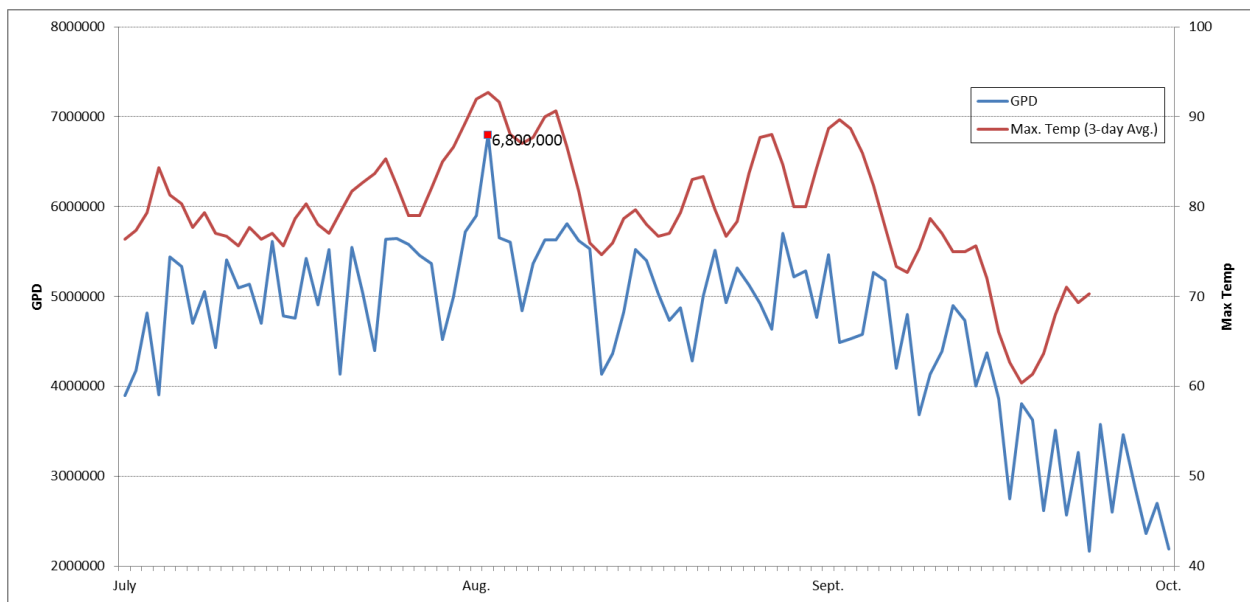


Figure 1: GPD Production and Maximum Temperature, Summer 2017

RESPONDING TO A WATER SHORTAGE

The WSRP involves four stages of phased response. These different stages can be triggered by environmental, infrastructure, or emergency factors. When possible, the stages will be implemented progressively to provide City staff, cooperating agencies and the general public with time to adjust to any new requirements.

The four stages of the WSRP are as follows:

- Stage 1: Advisory – Voluntary Reductions.** Water Resources staff evaluate operational and environmental conditions and collaborate with other departments to determine the likelihood of a shortage and to facilitate next steps. The public is encouraged to use water wisely. This stage is implemented every summer in preparation for high seasonal demand.
- Stage 2: Minor Shortage – Voluntary Reductions.** This is the first step in reducing water consumption during a real or impending water shortage. Based on previous studies, a 5% - 10%

reduction in water consumption can realistically be achieved with a voluntary program.

- **Stage 3: Moderate Shortage – Mandatory Restrictions.** Under a mandatory program, it is possible to achieve a 10% - 20% reduction in water usage. An appropriate response at this level is to institute mandatory conservation measures for nonessential outdoor uses and revising the utility rate schedule. These activities are enforceable under the authority of City’s water code (TMC 13.04.170).
- **Stage 4: Severe Shortage – Emergency Curtailment.** After implementing emergency curtailment measures, it is possible to achieve a 30% reduction in water consumption. Appropriate responses might include fixed allotments or percentage cutbacks, but should only be initiated during a severe shortage. This type of program will allow the City to conserve the maximum amount of water without creating hardship, and would have to be enforced through action by Council.

TRIGGERS

ENVIRONMENTAL

In anticipation of high demand each summer the City will enter Stage 1 of the WSRP. Other environmental conditions, such as low aquifer levels, may trigger implementation of the WSRP or an increase in stage. Tumwater’s water system operators will work with water resources staff to identify environmental conditions that may be impact well performance or water availability.

SUPPLY LIMITATIONS

The City uses a metric called Present Possible Production (P3) to assess the water utility’s ability to meet demand. P3 is expressed in million gallons per day (MGD) and represents the upper limit of sustainable production capacity based on a maximum pumping duration of 22 hours per day to allow adequate downtime for the pumps. To calculate P3, first determine the current capacity of each useable well expressed in gallons per minute (GPM). Current capacity is considered the average GPM, during a pumping cycle, for each well over a week of production. Sum the capacities for each well and calculate the total production potential over 22 hours of pumping. Different stages of the WSRP are triggered when daily demand exceeds certain thresholds relative to the P3 value. These thresholds are shown in Table 5.

Table 5: WSRP Daily Demand Triggers

Stage	Stage Triggers
1	Every Summer
2	> 90% of P3 for 3 days, or
	> 95% of P3 for 1 day
3	> 95% of P3 for 3 days, or
	> 97% of P3 for 1 day
4	100% of P3 for 1 day

Other infrastructure considerations that may trigger WSRP implementation include water main

breaks, booster pump failures, etc.

EMERGENCY

The context of a specific emergency will determine if it's necessary to initiate the WSRP. For example, during a theoretical emergency at the Palermo treatment plant during the winter months that requires removing that wellfield from production, the City could make up the lost production by running other wells longer or (with approval from Ecology) activating seasonal wells in the Port wellfield. If this same emergency occurred in the summer when all 11 primary wells are pumping 20+ hours per day, making up lost production would not be possible with operational adjustments alone. In this scenario the City would likely need to activate some of the conservation measures and/or restrictions outlined in this plan to keep up with high demand.

If an emergency occurs that will impact the water supply Water Resources staff will work with Operations to calculate the new P3 value based on revised production capacity. Staff will look at daily demand for the preceding month and determine if any of the P3 triggers described above would have been met. Staff will forecast demand for the coming months to determine if it is necessary to activate the WSRP. The severity and timing of the emergency will be critical factors to consider. For example, if the water supply impact is expected to last a long time or worsen over time staff should consider implementing the WSRP even if it looks like the short-term impact is not significant. Or, if the emergency occurs in the fall after the peak demand season, staff should consider that demand will naturally decrease in the winter months.

IMPLEMENTATION

The Operations and Maintenance and Water Resources Program managers within the Public Works Department have the primary responsibility of identifying water system supply and demand conditions that may lead to a water shortage. When environmental or operational conditions trigger a need for demand reduction these managers will convene a meeting to discuss options. This group will evaluate conditions and develop recommendations regarding the implementation of the WSRP. Pending approval from the Director of Public Works, this group will coordinate with other departments and staff to implement the plan.

By April of each year Water Resources staff will prepare a brief memo summarizing recent and forecast environmental conditions that could impact the water supply such as low groundwater levels or drought predictions. Every summer the City will implement Stage 1 of the WSRP, but if environmental conditions warrant it staff may choose to take extra steps to promote water conservation.

Each year after the City activates seasonal wells (typically by early to mid-June) and implements Stage 1 of the WSRP staff will calculate the P3 value and begin tracking daily demand. Staff will track daily demand every year from July thru September and as needed any time the WSRP is activated. At the end of the summer staff will prepare a brief memo summarizing the peak demand season.

Actions the City can take to address a water shortage can be grouped into two categories: supply augmentation and demand reduction. Because demand is significantly lower in the fall, winter, and

spring there are more options for keeping up with demand through increased production without relying on reducing consumption. In the event of a summer water shortage keeping up with demand would rely more heavily on conservation (demand reduction), although the City does have some flexibility to augment supply with emergency sources.

Water rights are an important consideration with any type of supply augmentation. Each well that the City operates is allowed a certain maximum flow rate (Q_i) and annual volume (Q_a). The City currently operates within its water rights, but a significant increase in the pumping rate or duration at any single well could put the City out of compliance. Before undergoing any drastic supply augmentation the City will analyze the impact to its annual allowance. If the added pumping is projected to exceed water rights then the City will work with Ecology to secure emergency authorization.

SUPPLY AUGMENTATION

INCREASE PUMPING TIME

The day to day cycles of the water system are largely automated by a supervisory control and data acquisition (SCADA) system. Pumps are switched on and off when reservoir levels reach certain set points. Figure 2 shows the average monthly on/off time for the City's 11 wells.

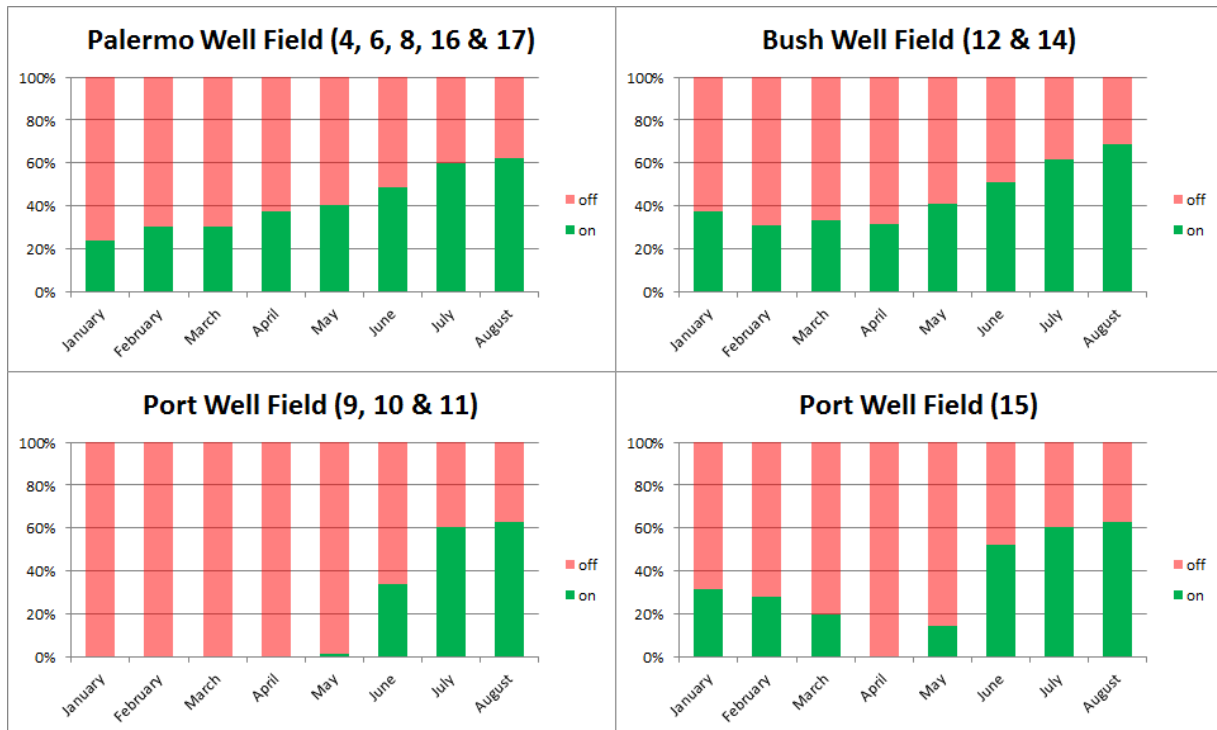


Figure 2: Typical ON/OFF Duration by Month for City Wells

This figure helps illustrate the typical amount of surplus capacity that exists each month from January thru August. On August 2nd, 2017 when the City reached its maximum daily demand (6.8 mgd) each well pumped for approximately 20 hours. To provide adequate downtime for the pumps they should

generally not operate longer than 22 hours a day.

ACTIVATE SOURCE

Wells 9, 10, and 11 are used as seasonal sources of supply and in the summer these wells account for a total of 11% of the City's production. The water rights for these wells restrict their use to May – October, but in the event of a water shortage emergency the City can request authorization from Ecology to pump outside of this timeframe.

Prior to 2019 the City maintained an emergency source of supply on the Tumwater Valley Municipal Golf Course near the Palermo wellfield. This well, known as well 24, was formerly used by the Olympia Brewery and is capable of yielding approximately 500 gpm with an appropriately sized pump. This well no longer serves as an emergency source of supply to the City and has been disconnected from the distribution system. The City will operate this well as an exempt well and has agreed to allow access to no more than five customers who intend to use this untreated source for non-consumptive commercial purposes.

ACTIVATE INTERTIE

The City of Tumwater and City of Olympia maintain two emergency system interties to share water in the event either jurisdiction suffers a critical loss of service. The specific requirements for use of these interties are outlined in the 2001 Mutual Aid Agreement between the Cities of Tumwater and Olympia for the Use of Emergency Water System Interties. A copy of this agreement is found as an attachment to the 2019 Water System Plan.

Both interties must be manually operated by Olympia and Tumwater. Water transfer to the City of Tumwater through the 8-inch intertie at SR 101/Crosby requires a portable booster pump as Olympia's pressure zone is at a substantially lower elevation than the adjacent Tumwater 454 Zone. At the 6-inch intertie located near Capital Boulevard the two jurisdictions' pressure zones are almost hydraulically equivalent. A portable booster pump can be installed to pump water from either system through either intertie as necessary.

DEMAND REDUCTION


In the event of a water shortage the City can maintain an adequate water supply by reducing demand. Staff has the discretion to use whatever tools are appropriate given the severity of the water shortage.

PUBLIC OUTREACH

Public outreach is critical to reducing water demand. Every spring prior to the peak demand season the City will conduct public outreach to stress the importance of water conservation through social media, the City's consumer confidence report (CCR), etc. If indicators point to a supply concern beyond normal summer peak demand staff will increase outreach efforts. These efforts will outline

the severity of water shortage, actions the City will take to alleviate the problem, and what individual consumers can do to help. Outreach for water shortages associated with summer peak demands should focus on outdoor water use while shortages during other times of the year should focus on indoor water use. Table 6 describes some specific tools the City may elect to use.


Table 6: Public Outreach Tools Available to the City Related to Severity of Water Shortage

Water Shortage Severity	Public Outreach Toolkit
Low  High	Reminders to use water wisely (social media, bill inserts, CCR, Johnson box, etc)
	Promote City and LOTT incentive programs (social media, bill inserts, CCR, Johnson box, etc)
	Conservation banner over Tumwater Blvd
	Prepare and distribute technical conservation information to specific consumer types
	Special purpose utility mailing
	News release to announce severe shortage
	News release to announce water use restrictions and prohibitions

WATER CONSERVATION ON CITY ACCOUNTS

The City of Tumwater irrigates many different properties including parks, City buildings, and right(s)-of-way and is one of top water users in the summer. The City can achieve significant water savings by reducing consumption on City properties. Doing so can send an important message to customers about water scarcity and the importance of conservation. If the City is asking its customers to cut back on water use during a shortage it is important that we demonstrate that we are willing to do so as well. Conservation messages posted on the City’s irrigated landscapes could be an effective component of an outreach campaign. The Table 7 shows irrigation related conservation measures the City should take at different stages of a summer water shortage.

Table 7: Irrigation Related Conservation Measures Related to Severity of Water Shortage

Water Shortage Severity	City of Tumwater Conservation Toolkit
Low  High	Promote water conservation practices within the City through internal publications, conversation, etc.
	Reduce irrigation on City properties
	Reduce water use for main flushing, car washing, street cleaning, power washing, etc.
	Let irrigated turfgrass go dormant (include educational signage)
	Convert turfgrass to a drought tolerant landscape
	Restrict irrigation on City properties
	Restrict main flushing to emergencies only
	Reduce system pressure to permissible levels

COOPERATIVE DEMAND REDUCTION

The City has a few significant commercial/institutional water users in its customer portfolio. Through cooperation with these entities the City may be able to reduce overall demand or peak summer demand for a short period of time. In the event of a water shortage staff will use the City's database tools to determine who the current major users are and reach out to these customers directly to request that they reduce consumption. The City may ask large users to reduce consumption by a certain percentage or may offer to conduct a free water use audit to determine if further reductions are possible.

RESTRICTIONS AND PROHIBITIONS

Water use restrictions and prohibitions are applied differently to three separate types of use. *Essential* uses are those needed to sustain human and pet life, maintain standards of hygiene and sanitation, and firefighting. *Social* uses include commercial applications such as car washes, laundromats, restaurants, agricultural irrigation, schools, churches, motels, etc. *Non-essential* uses are outdoor uses such as landscape watering, golf course irrigation, power washing, personal car washing, etc.


The demand reductions for Stage 1 of the WSRP are achieved through voluntary measures. Restrictions begin in Stage 2 for non-essential uses and expand to social uses in Stage 3 and essential uses in Stage 4. Prohibitions apply to non-essential uses in Stages 3 and 4. Table 8 below shows how restrictions and prohibitions are applied at different stages of the WSRP.

Table 8: Application of Restrictions and Prohibitions Based on WSRP Stage

Use Type	Stage 1: Advisory	Stage 2: Minor Shortage	Stage 3: Moderate	Stage 4: Severe Shortage
Essential Uses	Voluntary Conservation	Voluntary Conservation	Voluntarily Conserved	Restrictions
Social & Economic Uses	Voluntary Conservation	Voluntary Conservation	Restrictions	Restrictions
Non-Essential Uses	Voluntary Conservation	Restrictions	Prohibitions	Prohibitions

The specific regulations enacted by the City are at the discretion of the Public Works Director. These restrictions or prohibitions may target specific uses or broadly address use types depending on the nature and severity of the water shortage. The Table 9 lists a variety of measures the City could implement to reduce water consumption during a shortage.

Table 9: Water restriction measures the City may consider in a water shortage.

Water Shortage Severity	Water restrictions and prohibitions toolkit
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">Low</div>  </div>	Require that customers use the minimum quantity of water needed to maintain landscapes in a healthy, non-dormant condition
	Implement odd/even watering schedule for irrigation (even numbered addresses on even numbered days, odd numbered addresses on odd numbered days)
	Time of day restriction for irrigation (6 am to 9 am, 6 pm to 9 pm)
	Sprinkler bans (hand watering only)
	Prohibit potable water use for golf course irrigation
	Prohibit filling wading pools, swimming pools, and hot tubs
	Prohibit vehicle washing except at commercial facilities that reuse water
	Prohibit washing driveways, sidewalks, buildings, fences, or windows.
	Prohibit outdoor water use for aesthetic fountains or ponds
	Prohibit "water waste"
	Prohibit firefighting training activities
	Rescind hydrant permits
	Prohibit or limit the installation of new water meters
	Prohibit water waste from leaks or breaks in private distribution systems. Require repairs within reasonable timeframe.
	Restrict water for construction purposes (dust control, etc.)
	Require commercial kitchens to post bulletin alerting customers to water shortage. Businesses advised to only offer water when specifically requested
	Water consumption permitted for essential indoor use only
	Require that residential customers reduce water use by a percentage
	Require that commercial customers reduce water use by a percentage
	Implement severe restrictions on irrigation accounts
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">High</div> </div>	Water rationing

VariANCES

To soften the impact of these restrictions the City may elect to establish certain variances that would allow certain types of uses when restrictions or prohibitions are in effect. Some variances that the City may consider include:

- Newly planted flowers, plants, shrubbery, groundcover or trees may be hand watered any day of the week if the watering done is the minimum needed to sustain plant life
- Outdoor water use allowed for food production
- Outdoor washing permitted if it is required to prevent imminent damage
- Single-family and multifamily residential customers using less than 400 cubic feet of water

per month per customer or per housing unit shall be exempt from the requirement to reduce non-irrigation use

- Reclaimed water allowed for dust control or power washing
- Golf course watering allowed on greens and tees
- Certain recreational outdoor uses allowed if temperature is over 90 degrees

Authority

Tumwater Municipal Code, Chapter 13.04.170 contains provisions that allow the City to restrict water use in the event of a water shortage. This section of the water service regulations states the following:

The City reserves the right in the case of shortage of waters, or for any other cause, to make any order regulating, forbidding or restricting the use of water for irrigation or sprinkling or any other nonessential outside usage.

The Public Works Director, or their designee, is authorized to enforce the provisions of this section and any adopted use restrictions; the Director shall have the authority to authorize other City employees and departments to enforce such provisions and restrictions as deemed necessary, in consultation with the City Administrator. The City Council may need to be called on to take legal action through an ordinance, motion, resolution, and/or proclamation in order to restrict essential uses or social and economic uses during a severe shortage.

Enforcement

To enforce water use regulations during a stage 2 water shortage City staff will be directed to discuss regulations with customers and request compliance when these regulations are violated. During a stage 3 or 4 water shortage the City will begin to assess penalties to incentivize conservation. To facilitate the enforcement of water use regulations by Water Resources staff at these stages the City will do the following:

- Print self-duplicating “Notice of Violation” forms. One to be given to the customer and the other will be kept on file at the City
- Provide informational memo to all City staff alerting them to the new regulations
- Establish a process for reporting violations observed by City employees and the general public
- Establish a process for recording violations

Initial contact with violators will be made by Water Resources staff following visual confirmation of the reported violation. Contact will be in person or by phone and the goal will be to educate the customer about new regulations. Staff will record this as a first violation and inform the customer about the penalties to be levied after further violations. Future violations at the same location or by the same owner/operator will be subject to the terms outlined below. Multiple violations occurring on the same day will be treated as one violation. Each separate daily violation, and each day any violation is committed or permitted to continue, will be considered a separate offense as follows:

- Second Violation
 - On a second offense, the violator will be issued a formal written warning describing

the violation, requiring immediate cessation of the use in question, and advising that future violations will result in penalties. This Notice of Violation will be delivered by registered mail or hand delivered with date and initials of recipient. These written notices will be processed by the City's Public Works Department. There will be no monetary penalty for the second violation.

- Third, fourth, and fifth violations
 - On a third, fourth or fifth offense, the violator shall be issued another written notice and penalties will be imposed. The fine for a third offence is \$50, fourth is \$150, and fifth is \$350.
- Further violations
 - Sixth or subsequent violations will be fined a penalty of \$400.

Any monetary penalty imposed under the framework above that is not paid within 30 days from the issuance of the written notice will be added to the customer's water utility bill and collected in the same manner as delinquent accounts.

SUPPLY MONITORING

Throughout the water shortage incident water resources staff will monitor daily water production. If daily production surpasses any of the infrastructure triggers shown in the Triggers section of this plan, water resources and operations staff will discuss implementing a more advanced stage of the WSRP. Staff may elect to *not* increase the WSRP stage if the elevated daily production is believed to be temporary. However, if environmental, emergency or infrastructure conditions suggest a challenge to the water supply staff will increase the WSRP stage and implement the more proactive water conservation measures described above.

ADDITIONAL RESOURCES

The following websites catalogue additional resources that may be useful for planning a response to a water shortage.

- American Water Works Association (AWWA) drought resource community
 - <https://www.awwa.org/resources-tools/water-knowledge/drought.aspx#4429414-response-and-contingency-plans>
- EPA Drought Response and Recovery Guide
 - [https://www.epa.gov/waterutilityresponse/drought-response-and-recovery-water-utilities#Drought Guide](https://www.epa.gov/waterutilityresponse/drought-response-and-recovery-water-utilities#Drought%20Guide)
- Municipal Research and Services Center (MRSC) guide to water shortage use restrictions
 - <http://mrsc.org/Home/Explore-Topics/Environment/Water-Topics/Water-Shortage-Use-Restrictions.aspx>
- The Washington Water/Wastewater Agency Response Network (WAWARN)
 - <https://wawarn.org/>
- Washington Department of Health (DOH) guidance for preparing water shortage response plans
 - http://www.watersupplyforum.org/docs/6/773f6f0d95152843a051c624d028d80d5841da51/Dept.ofHealth_PreparingWaterShortageResponsePlans1.pdf