MEMORANDUM

EUGENE WATER & ELECTRIC BOARD

Rely on us.

TO:	Commissioners Barofsky, Schlossberg, Brown, Carlson, and Morris
FROM:	Karen Kelley, Chief Operations Officer; Mike Masters, Water Operations Manager; Chris Irvin, Water Engineering Supervisor, Nathan Endicott, Water Staff Engineer; Claire Wray, Communications Specialist
DATE:	April 1, 2025
SUBJECT:	2025 Water System Master Plan
OBJECTIVE:	Information

Issue

Water Operations & Engineering is nearing the midpoint on the 2025 Water System Master Plan (WSMP) update. The WSMP is required to evaluate the water system's ability to meet water quality and service goals for at least a twenty-year period in accordance with the Oregon Administrative Rule (OAR) 333-061-0060(5). At EWEB, we aim to update the plan approximately once every ten years to serve as the basis for the Water Capital Improvement Plan (CIP).

Background

At the January 7 Board Meeting, Commissioners requested a progress report on the 2015 WSMP. This memo provides a retrospective on the 2015 plan and outlines initial outcomes and themes from the current planning process.

Progress Since 2015 Master Plan

The following section summarizes progress on WSMP projects presented to the Board in May of 2015. As noted, the approach for achieving master plan objectives evolved over time with an increased focus on hardening EWEB's resilient spine of water infrastructure. Emergent projects were also folded into the plan based on external factors influencing the system and watershed. Figure 1 shows progress on projects related to the resilient spine. A detailed summary of progress and changes to planned projects is included in the subsequent tables.

Figure 1: Resilient Spine - Progress Since 2015 Master Plan

This figure shows the status of projects related to EWEB's resilient spine, which is the collection of infrastructure most critical to delivering water to Eugene.

Completed/In Construction In Progress/Upcoming

Simplified resilient spine; locations are approximate

MAP LEGEND

- First Priority Backbone Pipeline
- Removed from First Priority
- Core Base-Level Gravity Storage at 607 Feet
- Lower Elevation Storage

Source Water/Treatment

- A HB: Splitter Box Replacement and Drain Pipeline
- A HB: Filter S1-S6 Upgrade
- A HB: Disinfection System Replacement
- A HB: Seismic Upgrades Phase 2
- A HB: Standby Power Improvements
- A HB: Powder Activated Carbon (PAC) System
- B Willamette Water Treatment Plant

Base-Level Water Storage Facilities

- C New 15 MG storage at E. 40th
- D Rebuilding 15 MG storage at College Hill
- E Plan for Hawkins Hill and Santa Clara replacement

Transmission Pipeline

- 1 Hilyard Transmission Main
- 2 23rd Ave Transmission Main
- 3 Rebuild Replace Knickerbocker Bridge/Pipeline
- 4 23rd Street Transmission Main Alder to Emerald
- 5 Day Island 30" Transmission Main
- 6 42" Riverfront Connector

The following tables provide additional detail on WSMP progress and changes since 2015.

LEGEND

	Completed/in construction		In planning/design		Deferred

Source Water/Treatment Projects in CIP

EWEB has completed substantial planned work at the Hayden Bridge Water Filtration Plant and intake, as the plant is the start of our resilient spine of critical infrastructure. The Willamette Water Treatment Plant was listed in the CIP but put on hold by the Board in 2017, with the Board directing the water team to construct an Emergency Water Station system using well water as a source of supply. The Emergency Water Station program was completed at the end of 2024 and planning for the Willamette Water Treatment Plant resumed in 2023.

Source Water/Treatment Projects in CIP		
Project/Description	**Category**	**Status**
Hayden Bridge – Splitter Box Replacement and Drain Pipeline *Replacement of antiquated solids diversion structure and completion of pipeline to divert basin solids to sludge pond.*	Planned, Rehab.	Complete
Hayden Bridge – Filter S1-S6 Upgrade *Upgrade of the south 6 filters. The other 6 older filters have been upgraded previously.*	Planned, Rehab.	Complete
Hayden Bridge – Disinfection System Replacement *Replacement of the gas chlorine system at the plant. On-site generation of sodium hypochlorite will be provided.*	Planned, Rehab.	Complete
Hayden Bridge – Seismic Upgrades Phase 2 *Second phase of seismic upgrades. Work at Headhouse.*	Planned, Resiliency	Complete
Hayden Bridge – Standby Power Improvements *Generating capacity for both Intakes and Filtration Plant.*	Planned, Resiliency	Complete
Willamette Water Treatment Plant (Alternate Water Source) *New second water treatment plant with intake on the Willamette River.*	Planned, Resiliency	In Progress *RFP for design services expected in Q2 2025*
Hayden Bridge - Powder Activated Carbon (PAC) Discharging System *Following the massive fire in the McKenzie River watershed, addition of PAC was necessary to resolve taste and odor concerns. This project automated the addition of PAC at Hayden Bridge, increasing operator safety improving the reliability and operability of the plant.*	**Emergent**, Resiliency	Complete
Emergency Water Station Program *Seven geographically distributed emergency water stations capable of supplying two gallons of water per person per day to everyone in Eugene in the event of an emergency.*	**Emergent**, Resiliency	Complete (Public education ongoing)

Base-Level Facilities in CIP

The 2015 Master Plan called for a shift in EWEB's base-level storage approach, moving away from large storage facilities and embracing smaller reservoirs built for resiliency and operational flexibility. Following the completion of the master plan, EWEB further refined our approach for achieving this distributed storage model, including re-evaluating the priorities and sequencing of improvements to the resilient spine. Progress on the revised plan is shown below.

Base-Level Facilities in CIP		
Project/Description	**Category**	**Status**
Hawkins Reservoir Improvements *Construction of dividing wall and seismic upgrades.*	Planned, Resiliency	Deferred
Santa Clara Decommissioning and New 5 MG Reservoir *Demolition of Ex. Santa Clara Reservoir, replacement of pump station, and new 5 MG Reservoir.*	Planned, Resiliency	Deferred
New 5 MG Reservoir at Willamette Plant *New 5 MG reservoir at Willamette Plant Site. Not associated with Plant, just a site for distributed storage.*	Planned, Resiliency	Deferred
New 5 MG Reservoir at Elliot Site *New reservoir at existing EWEB property in South Eugene.* • ***Revised to:*** *Two new 7.5 MG storage tanks at the Elliot Site (E. 40th and Patterson in South Eugene).*	Revised, Resiliency	Complete
College Hill Decommissioning and New 5 MG Reservoir *Construction of new reservoir at site of abandoned College Hill 603 Reservoir, then decommissioning of College Hill 607 reservoir.* • ***Revised to:*** *Two new 7.5 MG storage tanks in the footprint of the former College Hill 607 reservoir.*	Revised, Resiliency	Under Construction

Transmission Pipelines in CIP

Deferral of the Willamette Water Treatment Plant and revisions in strategy for the base-level storage system necessitated changes to our transmission strategy as well. Work has been focused on reinforcing transmission pipelines on EWEB's resilient spine, which serve hardened base-level reservoirs at E. 40th and College Hill. The team is also working to harden and add redundancy to the Willamette River crossings on the resilient spine. EWEB secured FEMA grant funding to study alternatives for upgrading or replacing two critical Willamette River crossings.

Transmission Pipelines in CIP		
Project/Description	**Category**	**Status**
Glenwood Transmission Main Improvements *Upsizing 2,000 feet of 16-inch pipe to allow for delivery of Willamette Plant supply into the system and for the future connection to the Russell Basin.*	Resiliency	Deferred
Transmission System River Crossing and Pipeline Rehabilitation *Improvements to correct identified issues with existing transmission mains and their elevated crossings.* • ***Revised to:*** *Phase 1 - Alternatives Analysis for Knickerbocker Bridge and Day Island Willamette River Crossings.*	Resiliency, Rehab.	In progress, FEMA grant funded
23rd and Alder Street Transmission Improvements *Upsizing approximately 10,000 feet of pipeline.* • ***Split into two projects to reduce costs and community impacts:*** *(1) 42" Riverfront Connector; (2) East 23rd Street 42" Transmission Extension: Alder St to Emerald St.*	Optimization, Resiliency	Riverfront connector ~60% complete; 23rd scheduled for construction summer 2025
Expanded Willamette Plant Improvements *Upsizing Transmission main from Willamette Plant Site to Knickerbocker Bridge. Required when plant supply significantly exceeds 10 MGD.*	Resiliency	Deferred
Hilyard Transmission Main *Hilyard Street 36-inch steel transmission main from the East 40th Reservoir to East 33rd Ave.*	**Emergent**, Resiliency	Completion expected in Q2 2025
23rd Ave. Transmission Main *Transmission main from 23rd Ave to Amazon Pkwy to connect the College Hill Reservoir to the system.*	**Emergent**, Resiliency	Design underway Completion expected in 2027
Knickerbocker Bridge Rehab/Replacement. *Knickerbocker Bridge is one of the most critical and most vulnerable points on the resilient spine. FEMA awarded EWEB grant funding to evaluate alternatives and develop a 10% concept design.*	**Emergent**, Resiliency	10% Design to be completed in 2025, Tentative 2028 construction
Day Island 30-inch Rehab. *Alternatives being explored to rehabilitate an existing 30-inch pipeline to provide redundancy to the resilient spine for the existing 45-inch Willamette River and I-5 crossings.*	**Emergent**, Resiliency	10% Design to be completed in 2025, Tentative 2027 construction

Upper-Level Facilities in CIP

Deferral of upper-level facility projects recommended in the 2015 Master Plan was a result of prioritizing base level reservoir replacements, ongoing pump station control system upgrades, and responding to other emergent work in this category. Many smaller rehabilitations and upgrades were completed at upper-level facilities over the last 10 years.

Upper-Level Facilities in CIP		
Project/Description	**Category**	**Status**
Laurel Hill 850 Pump Station and Reservoir Improvements *Improvements to the Laurel Hill 850 Pump Station & Reservoir to allow decommissioning of the Fairmont 850 Pump Station* • ***Revised:*** *Laurel Hill 850 received minor upgrades to allow for decommissioning of the Fairmount 850 Pump Station. Pump station is scheduled to be rebuilt at a new location prior to the Willamette Water Treatment Plant going online.*	Optimization	Complete
Willamette 975 Pump Station *Pump station replacement.*	Existing, Rehab.	In-Progress Planning work started
Crenshaw Pump Station *New pump station near Gillespie Butte.*	Growth	Complete
Hawkins 1150 Pump Station *New station to replace both the ex. Hawkins 1150 and the City View 1150 pump stations.*	Rehab., Optimization	In-Progress Construction 2025
Crest 1150 Pump Station *Pump Station Replacement.*	Rehab.	Deferred
Shasta 975 Reservoir Improvements *Recoating existing steel reservoir.* • ***Revised:*** *Existing reservoir was at the end of its useful life and is being replaced with two new 0.5 MG storage tanks.*	Rehab.	In-Progress 2025 Construction
Willamette 800 Reservoir Replacement *Replacement of Willamette 800 Reservoir #1.* • *Deferred to allow for construction of base level storage tanks.*	Existing, Rehab.	Deferred
Crest 800 Reservoir *New reservoir to serve areas in southwest Eugene.*	Growth	Deferred
Shasta 800 Reservoir Improvements *Structural improvements to ex reservoir.*	Existing, Rehab.	Deferred – Waiting for piping improvements
Pump Station Control System Improvements *Multi-year project to upgrade pump stations*	Existing, Rehab.	Ongoing
Highland Drive Pump Station *New pump station to replace the existing Fairmount 975 and serve the University Overlook Subdivision.*	**Emergent**, Resiliency	Complete

Upper-Level Facilities in CIP		
Project/Description	**Category**	**Status**
Crest 1325 Pump Station Abandonment *New Pipeline from Willamette 1325 allowed for abandoning of this facility.*	**Emergent**, Resiliency	Complete

Main Improvement Optimization Projects

The 2015 Master Plan recommended consolidating the Shasta, Dillard, and Willamette 800 pressure zones for redundancy and operational efficiency. The connected zone will allow for reduced water storage and increased operational flexibility in maintaining pump stations and reservoirs. The final phase of this work is scheduled to be completed in 2026.

Main Improvements in CIP		
Project/Description	**Category**	**Status**
600 feet of 12-inch diameter pipeline to connect Willamette 800 PS to eastern Willamette 800 service area	Optimization	Complete
4,300 feet of 12-inch diameter pipeline to connect Willamette 800 and Dillard 800 service areas	Optimization	50% complete, Final phase tentatively scheduled for 2026
900 feet of 12-inch diameter pipeline to connect Shasta 800 and Willamette/Dillard 800 service areas	Optimization	Complete
New PRV station to Connect Shasta 975 to Laurel Hill/Fairmount 850 service area	Optimization	Complete

While many of the projects identified in the 2015 WSMP were completed, there are several that will be carried over to the 2025 plan as a result of the deferred and emergent projects listed above. Significant enhancements to the water system that were completed over the past decade are highlighted below:

- Installation of standby power at the intake and treatment plant played a critical role in EWEB's ability to maintain an uninterrupted water supply during the 2024 ice storm.
- Replacement of gas chlorine with the sodium hypochlorite system at the treatment plant has eliminated a major health risk and also mitigated impacts to EWEB during a regional chlorine shortage.
- Retrofit of the PAC building helped maintain customer confidence to mitigate taste and odor concerns following the holiday farm fire.
- Completion of base-level reservoir and transmission pipeline projects, based on an early adoption of Resiliency plan requirements, has greatly increased the seismic resiliency of the first priority resilient spine.

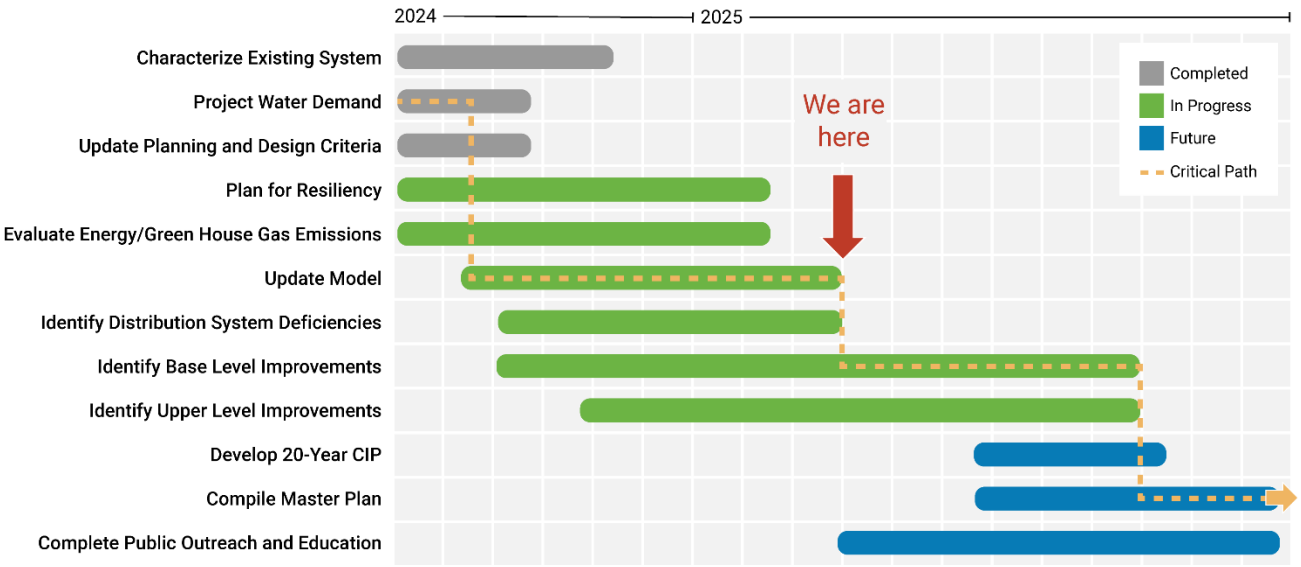
- Completion of the emergency water station project met customer priorities while balancing reliability and affordability.

Improvements at the source and treatment plant will allow a greater focus on the distribution system and Willamette Water Treatment Plant (second source) moving forward. Also, these enhancements to the EWEB water system are a direct result of the master planning process and are critical to maintaining our community's vitality.

Initial Findings from 2025 Plan

EWEB is nearing completion on the "Basis of Planning" phase of the 2025 WSMP. This includes developing planning and design criteria, estimating future water demand, and updating the hydraulic model. Precise execution of these tasks is critical as this data is the primary input for identifying future system upgrades.

All of the critical planning work is expected to take place in 2025, but the final compilation of the WSMP document and presentation to the board may extend into early 2026. Below is the overall schedule for the project.

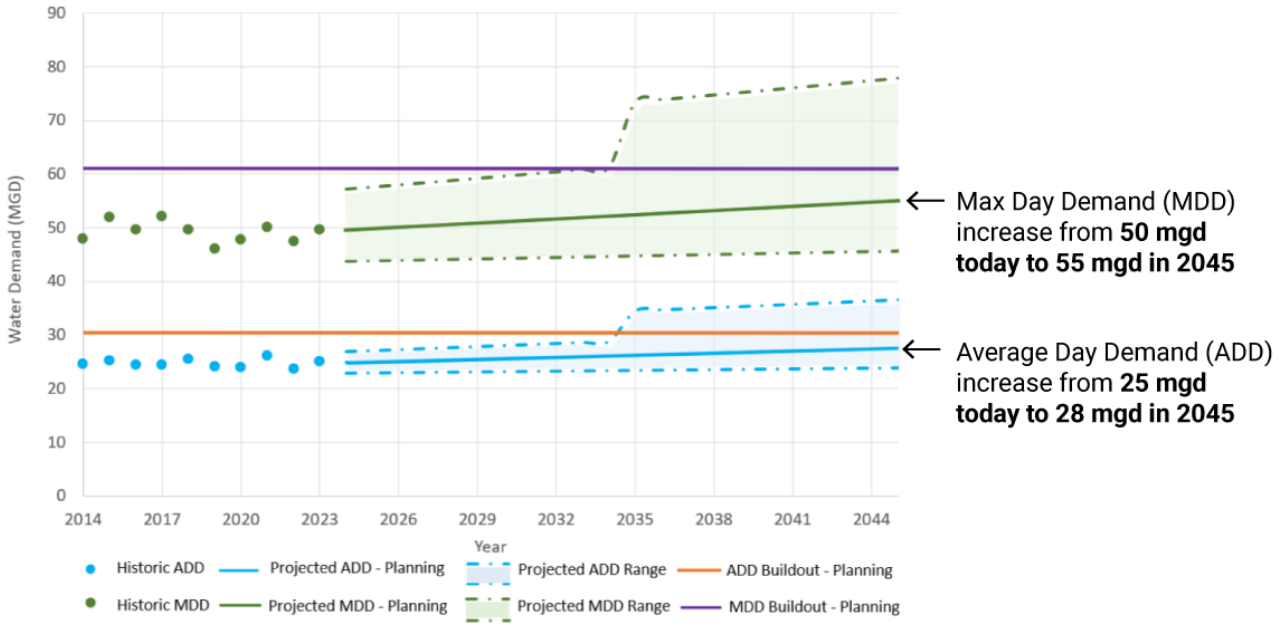


Water Demand

The City of Eugene provided employment and population projection data from the Buildable Land Inventory (BLI) and Urban Reserves Land (URL) analyses to serve as a basis for calculating water demand over the 20-year planning period.

The data shows housing and employment demand is expected to exceed the land available within the Urban Growth Boundary (UGB) by 2041, necessitating potential expansion in the URL. However, after calculating consumption for new connections, looking at diurnal patterns, and comparing with historical water use trends, our consultant determined Eugene is expected to absorb projected growth with relatively modest impact on water demand, just as it has for the last 10 years.

The following figure shows the range of potential water demand. The planning scenario will be used as a basis for future improvements.



Note: *The upper-level range for MDD and ADD spike around 2034 because of the potential addition of new wholesale connections to surrounding communities in the region. These are tentative additions, and the plan will be adjusted if agreements are solidified.*

Resiliency Planning

In parallel to the Basis of Planning tasks, the team has been working on developing a seismic risk assessment and mitigation (Resiliency) plan, a master plan requirement that became effective in 2019. This Resiliency plan is required because a portion of EWEB's service territory has a moderate damage potential based on model simulations for a magnitude 9 Cascadia event.

The goal of the Resiliency plan is to ensure critical facilities have water following a Cascadia event. This includes facilities on EWEB's resilient spine like base-level water storage tanks which are critical to support tasks like fire suppression and external facilities like police, fire, and emergency operations centers.

Hardening pipe to critical facilities is the primary strategy to achieve increased resiliency. However, hardening pipe is extremely expensive.

An initial draft from our consultant and their earthquake engineering expert called for the hardening of pipe to all the 10 fire stations in the city. Knowing that this would be unrealistic to ratepayers from a cost perspective, EWEB staff reached out to the Fire Chief to review stations and identify priority locations for service. Together, the team narrowed down the list of priority stations from 10 to 2 and highlighted priority fire hydrants along EWEB's resilient spine needed to support fire response.

By coordinating directly with service providers, EWEB is aiming to control costs and increase the efficiency and effectiveness of our resiliency planning efforts.

Optimization

The previous WSMP focused on the optimization of the base-level storage system. This master plan will close the loop on the base-level upgrades by providing a path forward for Willamette Water Treatment Plant, Hawkins Hill and Santa Clara.

The remainder of the optimization work will be focused on the upper-level system, which contains a greater number of small storage facilities and pump stations needed to serve higher-elevation customers. This optimization will be focused on improving water quality and hydraulic performance while reducing life-cycle costs, including greenhouse gas emissions where possible.

Public Outreach

EWEB is on track to launch the WSMP public outreach campaign this month. The project website will be published shortly, and all neighborhood associations will be invited to sign up to receive an informational presentation. The team will send a GM board info share once sessions are calendared to encourage Commissioner participation where possible.

Presentation attendees will be invited to fill out a short questionnaire. Input received will be used to amend the FAQ on the website and evolve presentation content to address areas of interest. Finally, we plan to share the story about community resiliency planning and cost savings in our May Current Connections e-newsletter to demonstrate our commitment to prioritizing affordability while planning improvements to the water system.

Requested Board Action

The project team anticipates the next update in five to six months to present preliminary optimization results and resiliency plan findings.

No action is requested at this time.