

Emergency Water Supply Master Plan

City Council Study Session

Lucy Liu, Director | Utilities

Eric LaFrance, Planning Manager | Utilities

Vanja Knezevic, Chair | Environmental Services Commission

September 18, 2023



Direction Needed from Council

Staff is seeking direction regarding adoption of the Emergency Water Supply Master Plan.



Why Council Action is Needed

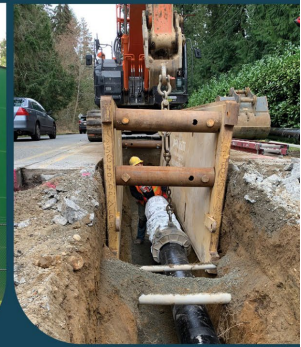
- Plan adoption required per BCC 24.02.070
- Adoption of post-earthquake level of service goal **required** per WAC 246-290-420
- New departmental policies
- Guidance for future CIP spending
- Council adoption demonstrates public support for grant applications



Agenda

- Background
- Key Plan Components
- ESC Recommendation
- Council Direction

City of Bellevue EMERGENCY WATER SUPPLY MASTER PLAN 2023



Emergency Water Supply Master Plan

Background





Background: Problem Summary

- 2016 Water System Plan identified need to address reliability of water supply
- Largest hazard to system is an earthquake
- Under current conditions water supply could take 2-3 months to fully restore
- Emergency plan seeks to improve resilience



Background: Steps

Emergency Well Evaluation



(Complete)

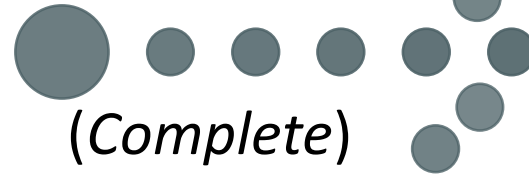
Seismic Vulnerability
Assessment/ Resilience Plan



(Complete)



ESC Review

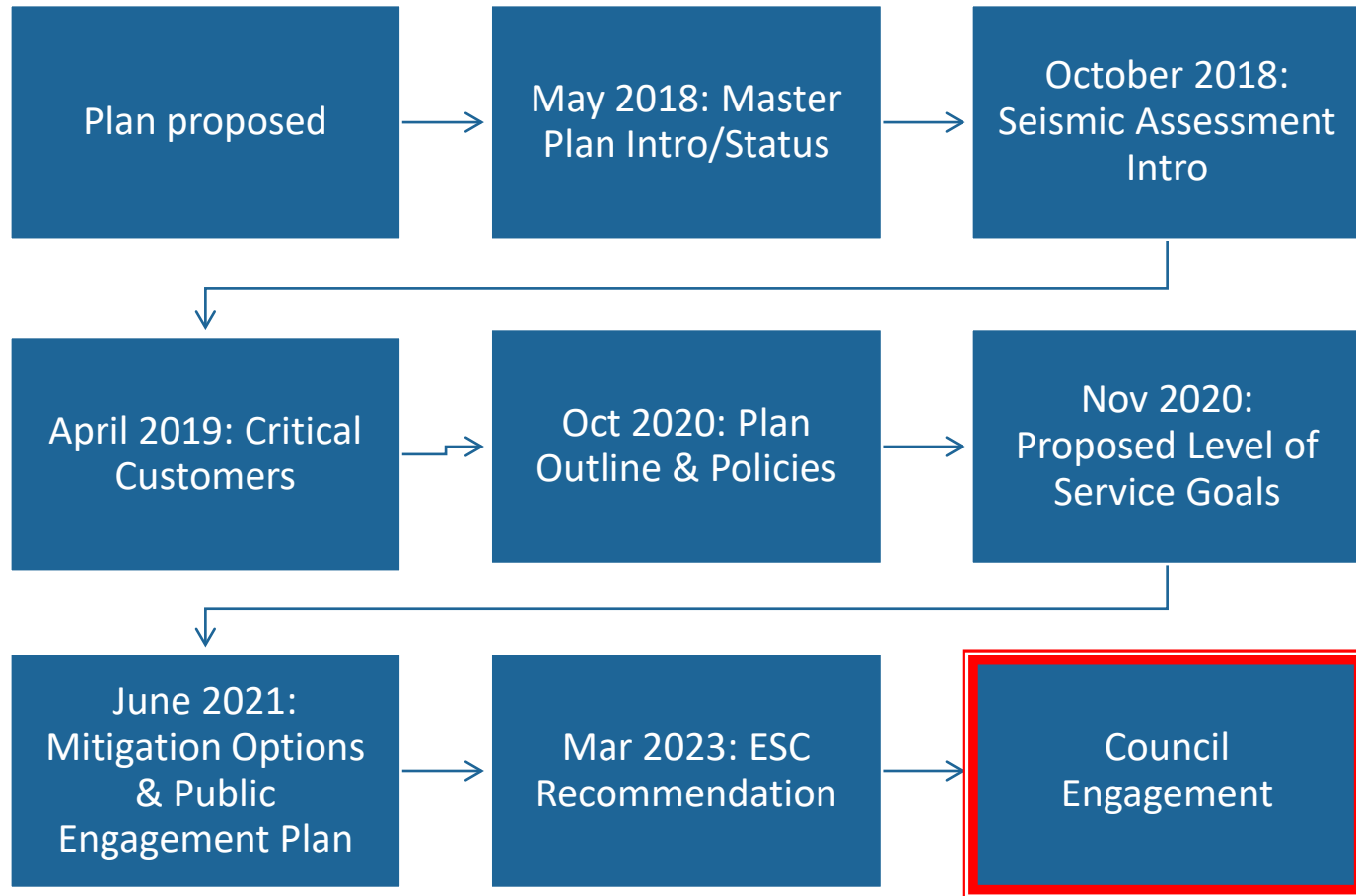


(Complete)

COUNCIL ENGAGEMENT



Background: Project Timeline



Emergency Water Supply Master Plan

Key Plan Components



Key Plan Components

- Purpose of Plan
- Hazards, Impacts, and Risks
- Policies and Implementation Timeline
- Post-Earthquake Level of Service Goals
- Recommendations
- Benefit/Cost
- Public Engagement



Purpose of Master Plan

Improved resilience through:

- Technical evaluation of risks and mitigation options
- Increased awareness and public buy-in
- Documented policies and recommendations

“It is a Water System Plan for major emergencies.”



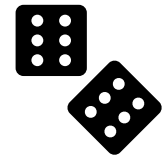
Seattle Fault Zone



- Two types of earthquakes
 - Cascadia Subduction Zone
 - Seattle Fault Zone
- Shallow Seattle Fault is potentially more damaging
- Roughly follows I-90



Hazards, Impacts and Risks



With existing infrastructure:

- Cascadia Subduction Zone
 - 1/500-year chance
 - 200+ breaks; 2+ month service recovery
 - \$2.3B economic damage
 - \$4.6M annual risk
- Seattle Fault East (under Bellevue)
 - 1/1,600-year chance
 - 500+ breaks; 3+ month service recovery
 - \$8.3B economic damage
 - \$5.2M annual risk

200-500
Main Breaks



3+ Month
Recovery



\$9.8M/year
Annual Risk



Proposed Policies

- Establish Post-Earthquake Level of Service Goals
- Identify Emergency Mitigation Investments
- Develop New Groundwater Supplies
- Encourage Public to Prepare for 14 Days of Water
- Coordinate with Other Utility Providers



Implementation Timeline

Three Timelines for Improvements

- Aggressive (<20-Yr)
 - Unaffordable and Unachievable
- Maintain Current Renewal & Replacement (R&R) Schedule (>100-Yr)
 - Slow to Address Risk
- **Preferred Option** - Risk Based Approach (50 Years)
 - Similar Timeline to Other Agencies



Recommendations Summary



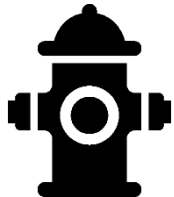
Resilient Supply:

- Install Emergency Wells
- Partner with Cascade/SPU to prioritize transmission



Backbone Piping

- Resilient pipe to key points
- Connecting Priority Customers



Distribution System R&R

- Continue main replacement
- Prioritize pump stations and reservoirs along Backbones



Timeline to meet:
50-year level of
service goals

Level of Service Goals

Recovery Period*, with Proposed Improvements



*Time to 80% - 90% of service restored, following Seattle Fault or Cascadia event



Value to Community

Impacts based on economic damage due to water disruption, with proposed improvements:

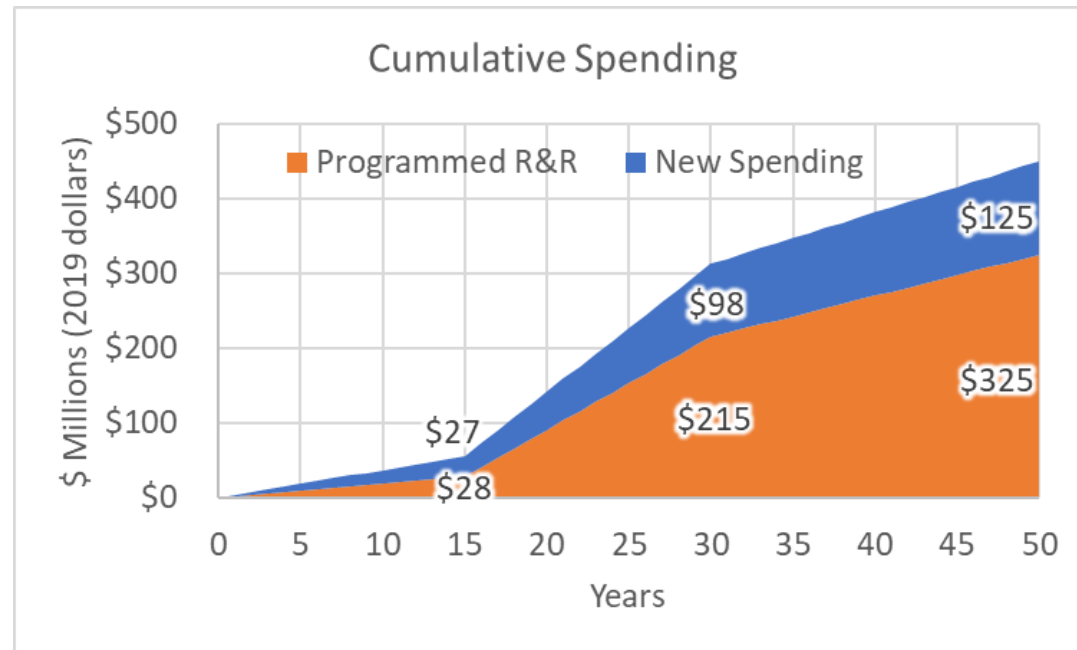
Annualized Risk (\$M/year)

	2020	2070	Benefit = Reduced Risk
Seattle Fault	\$5.2	\$0.4	\$4.8
Cascadia	\$4.6	\$0.1	\$4.5
Combined	\$9.8	\$0.5	\$9.3



Costs

- Most \$ programmed as R&R already
 - Reduces failures
 - Shortens later phase recovery 1-2 months
- New Spending (wells, backbones)
 - Shortens critical first phase of recovery by 2-4 weeks



New Spending - Benefit/Cost

Benefit (reduced risk) versus cost:

Timeframe	<u>Seismic Benefit</u> <u>New Spending</u>
Short-Term (15-year)	5.2
Mid-Term (30-year)	2.4
Long-Term (50-year)	2.5

- New spending includes backbones, wells



Public Engagement

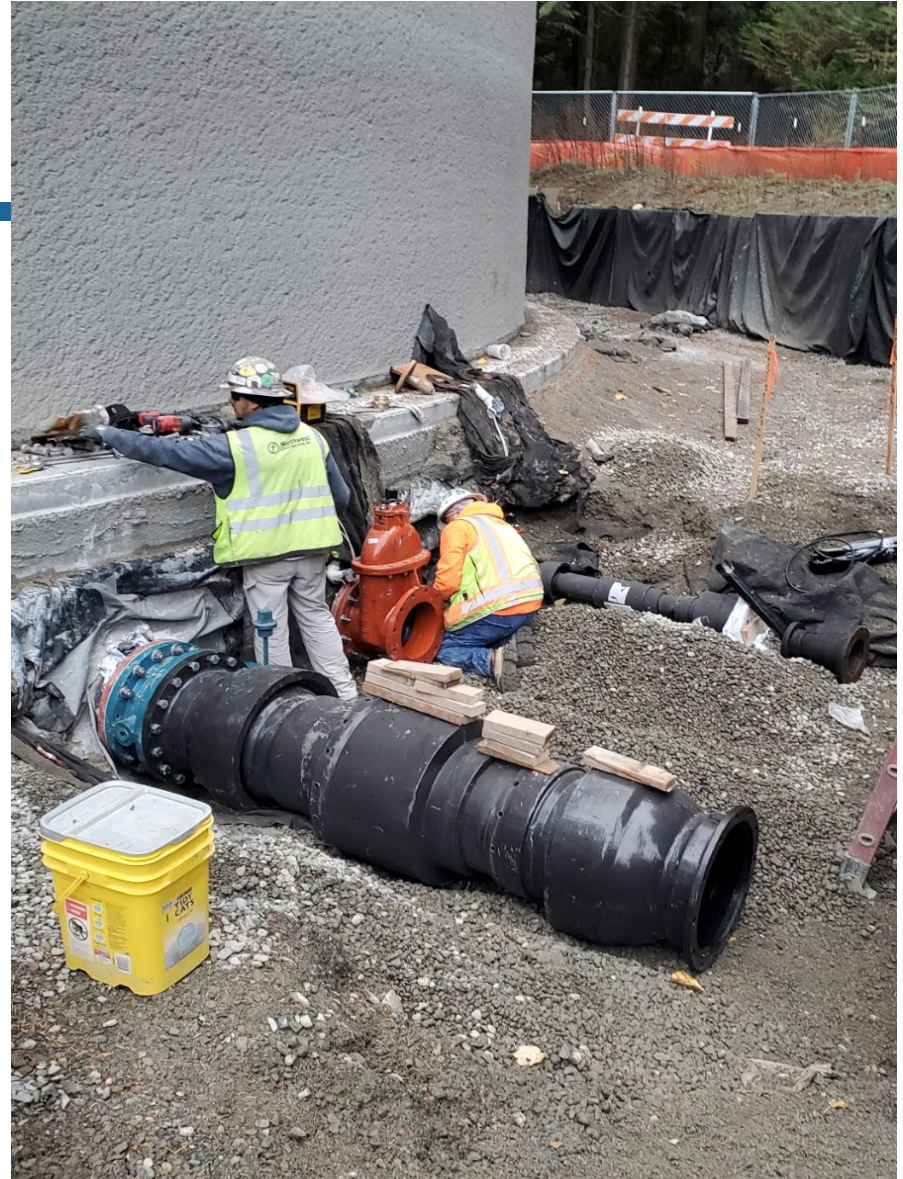
Outreach was conducted in late 2021.

- Over 1,079 survey responses
 - 20% Response Rate
- Other Interested Parties
 - Critical Customers
 - Community Based Organizations
- Feedback demonstrated:
 - Resilience planning reflects community values (77%)
 - Support for critical customer policies
 - Less than 10% of residents have adequate emergency water



Plan Outcomes

- Investments reduce annual risk by 95%
 - \$9.8M down to \$0.5M
- Service interruptions for Critical Customers reduced from three months to one week



Staff and ESC Recommendation

Adopt the Emergency Water Supply Master Plan to improve water distribution system resiliency.

City of Bellevue EMERGENCY WATER SUPPLY MASTER PLAN 2023



Direction Needed from Council

Staff is seeking direction regarding adoption of the Emergency Water Supply Master Plan.

