



King County

Department of Natural Resources and Parks
Wastewater Treatment Division

Resiliency and Recovery Program



Resiliency Work to Date
MWPAAC Engineering and Planning Subcommittee Briefing
Thursday, October 5, 2017



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Purpose

Develop a comprehensive strategy for preparing WTD's conveyance and treatment facilities for the impacts of a major earthquake, flooding or natural hazard events.





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Project Team

Wastewater Treatment Division

Consultant – HDR Engineering Inc.

- Ballantyne Consulting – Regional Seismic Expert
- Shannon & Wilson and Reid Middleton Engineering

MWPAAC Taskforce

- Alderwood Water and Wastewater District
- City of Redmond
- City of Seattle



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Seismic Scenarios

Cascadia Subduction Zone

- Primary focus as the most likely scenario

Seattle Fault

- Very strong ground motion along I-90 corridor
- Surface fault rupture can result change in sewer grade

South Whidbey Island Fault

- Very strong ground motion near Brightwater
- Surface fault rupture/change in sewer grade



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Natural Hazards & Flooding Scenarios

Hazards identified in *King County Regional Hazard Mitigation Plan 2014*, presenting High and Medium Risks:

- **Extreme Weather**

- Windstorms, lightning, tornadoes/funnel clouds, and windstorms
- Significant snowfall, ice, and/or freezing rain

- **Flooding**

- Riverine Flooding and Urban Flooding

- **Landslide & Liquefaction**

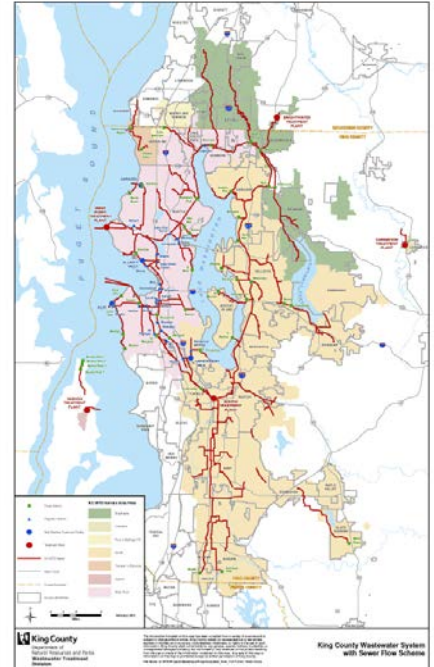


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Approach

- Phase 1** Existing Data Collection: Desktop Studies of Facilities and Conveyance
- Phase 2** Fieldwork: Facility Condition Assessments
- Phase 3** Develop Resiliency and Recovery Approach

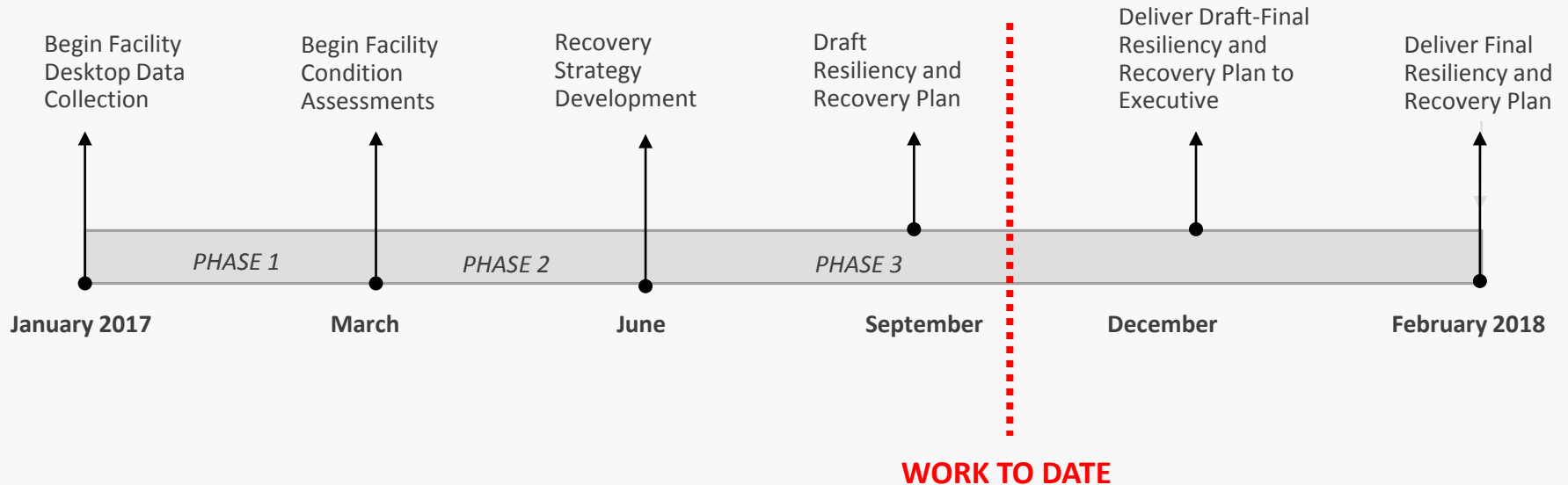




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Schedule



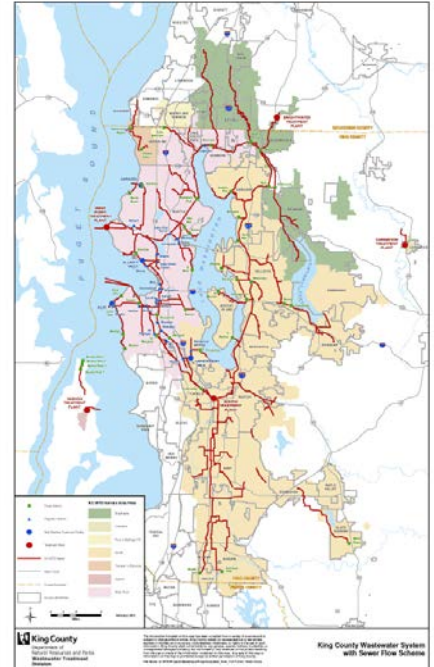


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Resiliency Plan Approach

- Identify vulnerable facilities
- Conduct fieldwork investigations
- Identify potential issues related
- Develop conceptual solutions
- Determine and prioritize

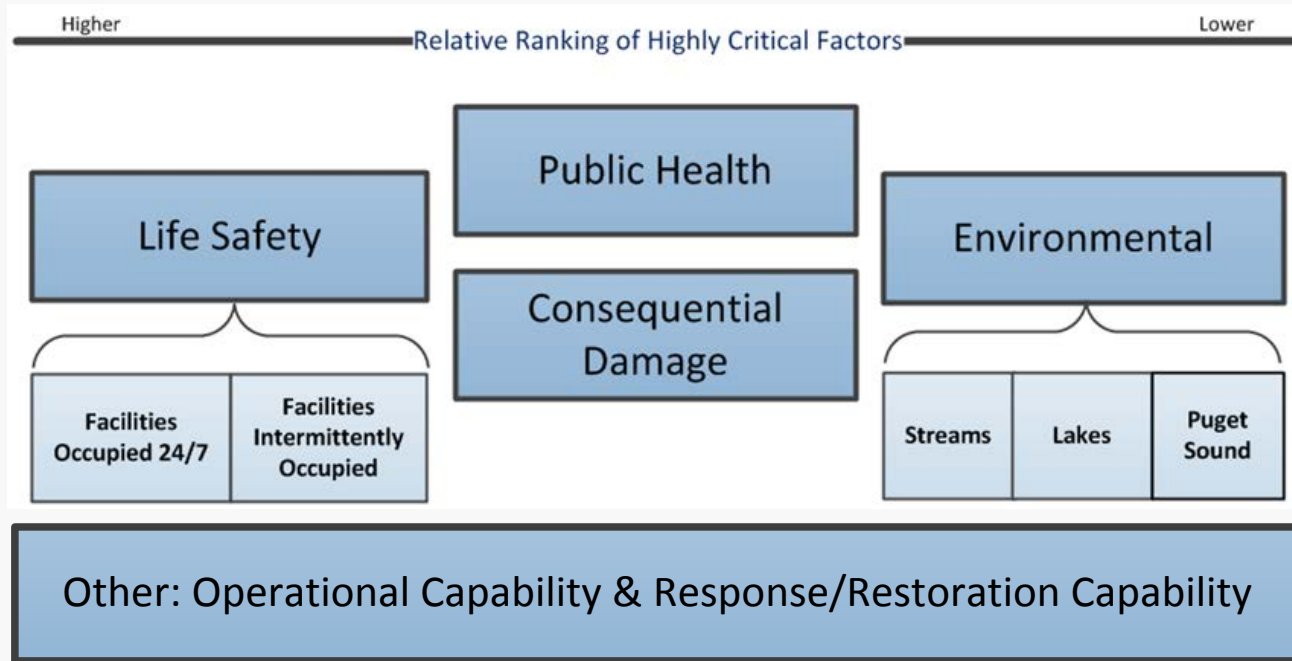




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Criticality Factors



Life Safety:

Building collapse

Public Health:

Sewage backup

Consequential Damage:

Impacts to adjacent critical infrastructure

Environmental:

Sewage discharge location & level of treatment



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Prioritization of Capital Projects

1. Criticality Factors

- Life Safety
- Public Health
- Consequent Damage
- Environmental

2. Risk

- Consequence of Failure: Expected System Performance
- Probability of Failure: Vulnerability to Hazard

3. Team Validation

Seismic – Issue Identification

- Significant or moderate structural damage
- Building, wall, roof collapse risk
- Pounding damage



Extreme Weather – Issue Identification

- Falling trees or airborne limbs/debris could affect facility operations - facility structures, systems, and/or power
- Impede facility access for employees



Flooding – Issue Identification

- Damage of underground mechanical and electrical equipment



Landslide & Liquefaction – Issue Identification

- Structure may float, sink, rotate or move laterally



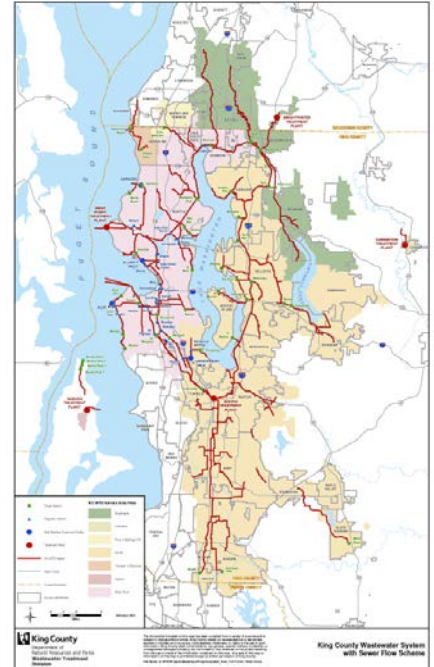


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Recovery Plan Approach

- Develop comprehensive strategies for implementation
- Strategies are designed to drive timely, efficient and safe system recovery
- Preparedness and Recovery Strategies:
 - Team Development & Training
 - Contracting
 - Design and Data Collection
 - Management and Administration





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Next Steps

October 2017

- Develop conceptual solutions for problems identified
- Develop Class 5 Cost Estimates for preliminary solutions

November 2017

- Refined Capital Projects List developed
- Draft Resiliency and Recovery Plan for WTD Management Review

December 2017

- Deliver Draft-Final Resiliency and Recovery Plan to WTD Management and Executive for review

February 2018

- Deliver Final Resiliency and Recovery Plan

Thank You

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