Water Transmission & Distribution System Plan

A Road Map for Addressing Key Issues in the Water Transmission & Distribution Systems & Guiding CIP and O&M Spending for the 2015 -2020 Rate Period....

Briefing for WSAC
April 21, 2014
Transmission & Distribution System Assets

The Combined T/D System includes the following assets:

- Approximately 1,800 miles of pipeline, including nearly 200 miles of transmission pipelines and over 1600 miles of distribution water main
- 400 million gallons of treated water storage in 13 covered reservoirs, and 12 elevated tanks and standpipes
- 31 pump stations
- 129 wholesale customer taps with meters
- 21,000+ distribution system valves
- 18,920 fire hydrants
- More than 188,000 retail service lines and meters.
The overall goals of the plan include:

1. Address gaps in planning and policy that can improve consistency, quality and timeliness of decision making for the transmission & distribution systems

2. Develop system assessment tools, initiatives and programs to improve our ability to effectively manage water system assets


4. Review O & M activities for the Transmission & Distribution Systems, identifying deficiencies, gaps or opportunities for efficiencies
Trans & Dist Plan Organization

The plan is divided into several parts:

1. Planning & Policy, System Assessment Tools & Initiatives
2. Capital Improvement Program 6-Year
3. Review of FOM Branch O&M Programs
Planning & Policy Development

- Seismic Reliability Planning & Program Development
- SODO Area Water Infrastructure Plan
- Water Main Replacement Program Refinement/Long-term Strategy
- Asset Management Plans
- Tolt Pipeline Slide - Strategy
Water Mains

Miles of Water Pipe In Service by Age

Average Pipe Age (years)
Tolt Slide Location

Slide impacting a stretch of the Tolt pipelines. Developing long-term plan for pipeline reliability and seismic risk.
System Assessment Tools & Initiatives

- New Hydraulic Modeling Software Platform
- Pipeline Condition Assessment Program
- Distribution Pipeline Criticality
- High Impact Shutdown Blocks
- PS Energy Efficiency Study
- Asset Data Quality
Distribution System

- **Distribution program overall**: 6 yr funding at $133.4M, roughly $22M/yr

- Highlights of program include
  - **Service Renewals (C1109)** - 6 yr funding at $31.5M
  - **Distribution System Improvements (C1128)** - 6 yr funding at $21.1M, Spending focused on:
    - Fire flow improvements – $3.3 M scheduled for construction in 2015,
    - Pipeline seismic program - $1.2M in 2015-16 for segment of seismic backbone
    - Reserve dollars for future fire flow, seismic, and other distribution improve opportunities
SODO Area Seismic Backbone

A. S Spokane St. from 1st Ave to 5th Ave

B. S Spokane St. from 8th Ave to 9th Ave S, under I-5 exchange

C. 1st Ave S from S Horton St to S Stacey St

D. 1st Ave S & S Spokane St Intersection, plus 1st Ave S from S Spokane St extending approx. 400 ft. North

E. 1st Ave S, from S Stacey St to S Atlantic St
Distribution System -continued

- **New Taps (C1113)** - 6 yr funding at $38M
- **Pump Station Improvements (C1135)** 6 yr funding of $3.4 M
- **Water Main Rehab program (C1129)** - 6 yr funding is at $23M, Investments include:
  - SE Seattle WM Replacement - $2.2M for construction in 2015
  - $6.3 M for the 3rd Ave W feeder replacement construction in 2017-2018
  - 3 additional WM rehab projects of approx 1 mile each are proposed in 6 yr period
3rd Ave W feeder replacement
3rd Ave West Utilidor Existing Conditions (not to scale)

Plan View Vertical Shaft

Plan View Horizontal Segment

Utilidor Profile View

To Queen Anna

~ 80 ft

~ 30 ft

~330 ft

Lake Washington Ship Canal

To Fremont

9/9/2013

3rd Ave West Feeder
Reservoir Program

- C1408 -C1411 Res Covering—at a 6 yr funding of $20.2M
  - Reservoir Seismic retrofits (4)
  - Planning & design for Bitter Lake and Lake Forest Park
    Floating cover replacements in 2019-2020
SPU Drinking Water Reservoirs

<table>
<thead>
<tr>
<th>Reservoir</th>
<th>Status</th>
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<tbody>
<tr>
<td>Riverton</td>
<td>Covered (from start)</td>
</tr>
<tr>
<td>Eastside</td>
<td>Covered (from start)</td>
</tr>
<tr>
<td>View Ridge</td>
<td>Covered (from start)</td>
</tr>
<tr>
<td>Magnolia</td>
<td>Covered (1994)</td>
</tr>
<tr>
<td>Bitter Lake</td>
<td>Covered (floating/ 2001)</td>
</tr>
<tr>
<td>Lake Forest Park</td>
<td>Covered (floating/ 2002)</td>
</tr>
<tr>
<td>Lincoln</td>
<td>Covered (2005)</td>
</tr>
<tr>
<td>Myrtle</td>
<td>Covered (2008)</td>
</tr>
<tr>
<td>Beacon</td>
<td>Covered (2009)</td>
</tr>
<tr>
<td>West Seattle</td>
<td>Covered (2010)</td>
</tr>
<tr>
<td>Maple Leaf</td>
<td>Covered (2012)</td>
</tr>
<tr>
<td>Roosevelt</td>
<td>In Test Decommissioning</td>
</tr>
<tr>
<td>Volunteer</td>
<td>In Test Decommissioning</td>
</tr>
</tbody>
</table>

Current Reservoir Covering Program

- Lincoln: Covered (2005)
- Myrtle: Covered (2008)
- Beacon: Covered (2009)
- West Seattle: Covered (2010)
- Maple Leaf: Covered (2012)
- Roosevelt: In Test Decommissioning
- Volunteer: In Test Decommissioning

Map showing the locations of various reservoirs with status labels and map legends.
Interior of Beacon Reservoir
Transportation Related programs

- C4102-C4135  Transportation at 6 yr funding of $33.5M,
  - $6M planned for WM replacement triggered by SDOT’s 23rd Ave Corridor project 2-15-2016
  - Placeholder dollars in 2017-2020 for future unknown /to be identified transportation project impacts and opportunities
23rd Avenue Corridor Improvements Project

Phase 3
Work Elements:
- Maintain 4 lane cross section
- Reconstruct pavement
- Sidewalk repair
- Bus stop improvements
- Upgrade signalized intersections
- Upgrade controller cabinets
- ITS with travel time information
- Install fiber
- Install art
- Lighting upgrade

Phase 1
Work Elements:
- New 3 lane cross section
- Expand sidewalks
- New landscaping
- Reconstruct pavement
- Bus stop improvements
- Upgrade signalized intersections
- Upgrade controller cabinets
- ITS with travel time information
- Install fiber
- Install art
- Install trolley poles
- Construct parallel greenway (separate project)
- Lighting upgrade

Phase 2
Work Elements:
- New 3 lane cross section
- Expand sidewalks
- New landscaping
- Reconstruct pavement
- Bus stop improvements
- Upgrade signalized intersections
- Upgrade controller cabinets
- ITS with travel time information
- Install fiber
- Install art
- Install trolley poles
- Close Hill Street
- Lighting upgrade
Transmission System

• Transmission program Overall: 6 yr funding $15.6M

• Highlights of program include:
  ✓ Transmission PL Rehab (C1207) - at a 6 yr funding of $8.6 M
    Investments include:
    o $2M in 2015-16 for 430 PL rehab in the vicinity and within the Lake Union Tunnel
    o Tolt pipeline slide mitigation - approx. $1M/yr starting in 2016.
    o Currently exploring tunnel option to move pipeline away from slid hazard area

✓ Cathodic Protection (C12208) – at a 6 yr funding of $4.9 M:
Overall Transmission & Distribution System CIP (6-YR)

- Distribution $133.4M
- Transmission $15.6
- Reservoirs $22
- Shared Cost/Transportation $33.5

Overall $202.8
Distribution O&M:

- **Distribution System Valve O&M program:**
  - Most valve preventive maintenance work has been suspended for the last decade
  - Incidence of crews being unable to effectively shut down water mains using neglected line valves is up
  - Recommended programming 2 field crews (4FTE) to establish/restore a distribution system valve operations program

- **Hydrant maintenance:** Recommend restoring seasonal hydrant painting program at a ten-year painting cycle.
QUESTIONS