Status Briefing: CSI Program Update and I/I Program

September 1, 2016

King County
Department of Natural Resources and Parks
Wastewater Treatment Division

Presentation Topics

- Follow-up from August presentation
  - Additional information on CSI Program Update – conceptual projects to address identified conveyance system needs
  - Overview of CSI Program Update Project Prioritization Criteria

Steps to Complete CSI Program Update

Update Planning Assumptions

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Complete Regional Conveyance System Needs Assessment

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We Are Here → Develop Conceptual Projects and Planning Level Cost Estimates

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Conceptual Project Prioritization

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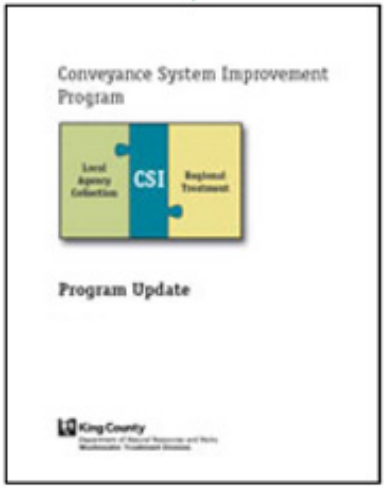
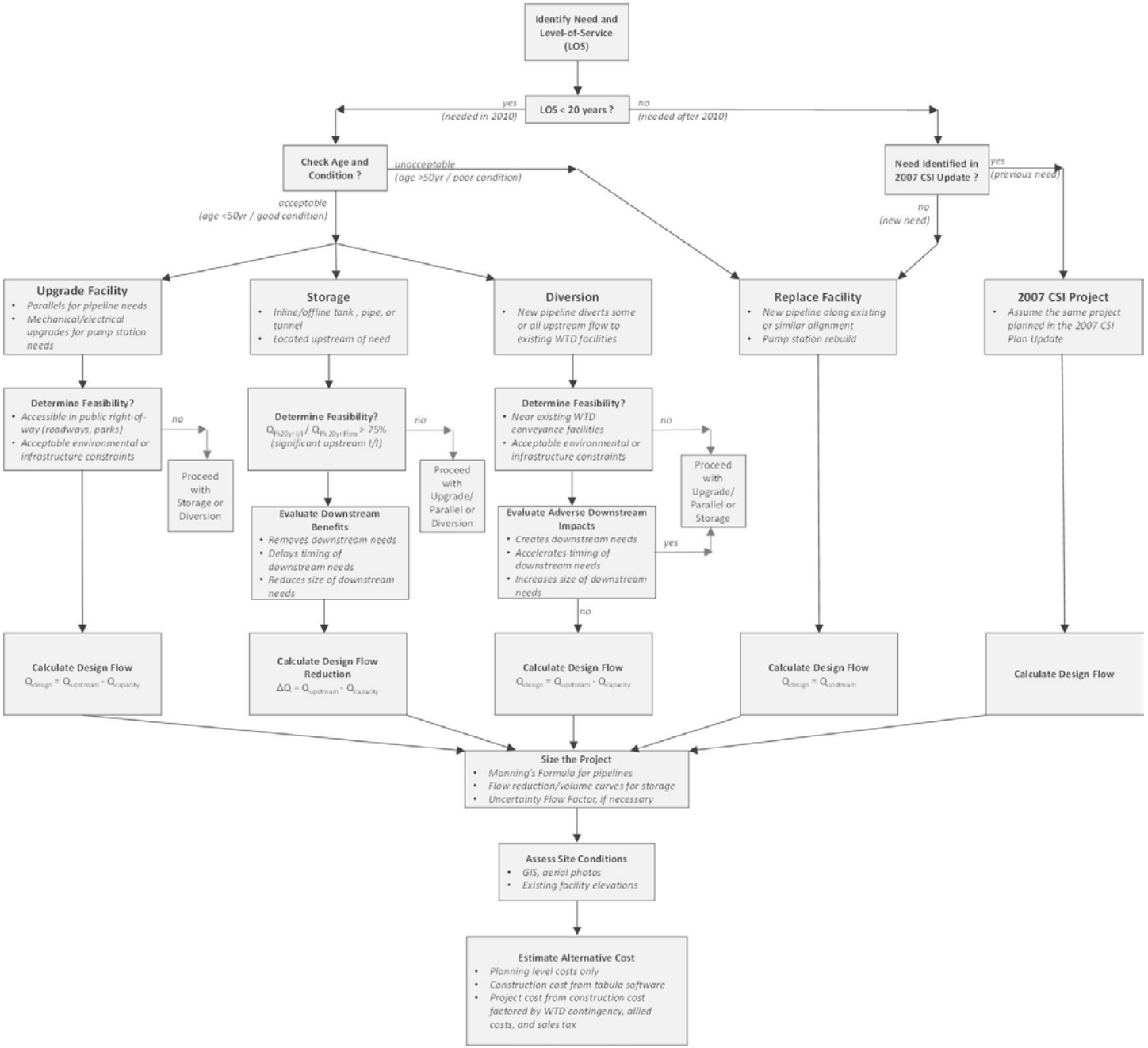


Some Context on Conceptual Projects

- Projects are developed for near and long-term programmatic planning
- It is expected that 5-10 of the projects will be implemented in the next 10 years
- Many projects will not be implemented for decades
- All projects undergo full alternatives analysis during implementation
- Project prioritization, and input on, will be done later this year
- Type of input sought on projects
  - Does the concept make sense from a local agency perspective
  - Any local utility or other plans that overlap with the project

Process to Evaluate Alternatives for CSI Needs



Example Conceptual Project Description

Conceptual Project: Medina Trunk Replacement

Capacity Needs Addressed

Medina Trunk

Location

Sewer Agency: Bellevue Utility Services
Jurisdiction: City of Medina
Planning Area: Northeast Lake Washington

Existing Facilities and Capacity Needs

Conveyance Facility	Upstream Manhole	Downstream Manhole	Length (ft)	Diameter (in)	Year Built	Capacity (mgd)	2060 20-yr Peak Flow (mgd)	2060 20-yr Peak Flow Exceeded (mgd)	Year Exceeded	2010 Level of Service (yr)
RE*MEDINA.T-18(8)	T-18	T-11	3,427	21	1963	3.52	5.60	2.08	2010	8.5
RE*MEDINA.T-11(11)	T-11	T-02C	2,073	24	1963	5.21	8.69	3.49	2010	6.7
RE*MEDINA.T-02C(1)	T-02C	T-02B	34	12 (x 2)	1963	8.28	8.69	0.41	2051	>20
RE*MEDINA.T-02B(3)	T-02B	Medina	169	24	1963	5.85	12.48	6.64	2010	>20

Project Description

Components and Construction Methods

The Medina Trunk Replacement Project replaces all 5,703 feet of the Medina Trunk with 24-inch to 36-inch-diameter pipeline. Construction is assumed to be trench-cut. The conceptual alignment follows the existing WTD conveyance route from manhole T-18 to the Medina Pump Station.

Upstream and Downstream Considerations

Upstream Projects: None

Downstream Projects: Medina Pump Station Upgrade; Medina Siphon Replacement; Eastside Interceptor Section 8 Storage; Eastside Interceptor Section 1 Replacement

Concepts Evaluated

- **Storage.** Storage was evaluated by the volume required to address downstream pipe reach needs in the Medina Trunk, Medina Pump Station, and Medina Siphon. Peak flow reduction-to-volume relationships were developed at upstream manholes T-18 and T-09 and the Medina Pump Station in series. It was determined that these volumes of storage would be 0.4 MG, 0.71 MG, and 0.36 MG, respectively. However, the estimated total construction cost of $11.9M ($2016) exceeds the cost for the replacement alternative. Storage was not considered further for a conceptual project.
- **Paralleling.** Paralleling was evaluated by the age and condition of the pipe reach needs. The Medina Trunk was constructed in 1963. In a 2011 assessment, WTD Facility Inspections found moderate signs of corrosion, sedimentation, root intrusion, or infiltration. Paralleling was not considered further for a conceptual project because of age (more than 50 years old in 2016) and condition.

- **Diversion.** Diversion was evaluated by upstream flow and route. Sufficient flow could be diverted from upstream manhole T-18 to address downstream pipe reach needs in the Medina Trunk, Medina Pump Station, and Medina Siphon. However, no feasible diversion route to the Eastside Interceptor Section 13 could be proposed. Diversion was not considered further for a conceptual project.

Estimated Project Costs

Construction Costs

Conveyance Facility	Segment (manholes)	Project Element	Construction Methodology	Diameter (in)	Length (ft)	Design Capacity	Construction Estimate ($2016 x 1M)
RE*MEDINA.T-18(8)	T-18 to T-11	Pipe replacement	Trench-cut	30	3,427	7.00 mgd	$2.1
RE*MEDINA.T-11(11)	T-11 to T-02C	Pipe replacement	Trench-cut	36	2,073	10.9 mgd	$1.7
RE*MEDINA.T-02C(1)	T-02C to T02B	Pipe replacement	Trench-cut	27	34	9.31 mgd	$0.03
RE*MEDINA.T-02B(3)	T-02B to MEDINA	Pipe replacement	Trench-cut	36	169	15.6 mgd	$0.1

Total Project Cost

The construction cost estimate is $3.95M ($2016) for the Medina Trunk Replacement Project. The project cost estimate is $12.2M ($2016) after applying allied costs, project contingency, and construction cost and change order allowances. Cost estimating methodologies are as follows:

- The construction cost was estimated with Tabula conveyance system cost estimating software. Tabula is a parametric construction cost estimation tool used for conceptual or feasibility studies for projects at the 0 to 2 percent design level. Additional information on Tabula can be found at http://www.kingcounty.gov/services/environment/wastewater/csi/tabula.aspx.
- Allied costs (including design allowance, change order allowance, engineering, permitting, WTD staffing) were estimated based on a percentage of project construction costs in WTD's project management database, PRISM. These allied cost percentages are based on a statistical analysis of different types and sizes of WTD's historical project costs over time.
- Overall project contingency (30 percent), construction cost allowances for indeterminate items (25 percent), and construction change order allowances (10 percent) are added in accordance with WTD estimating guidelines appropriate to this class of estimate.
- The estimate is an early AACE International Class 5 cost estimate based on 0–2 percent project design. Class 5 estimates are considered to have an accuracy range of -50% to +100 percent. (AACE RP No. 18R-97, Cost Estimate Classification System – As Applied in Engineering, Procurement, and Construction for the Process Industries: http://www.aacei.org/toc/toc_18R-97.pdf).

Example Conceptual Project Description

CSI Prioritization Criteria

- Year of exceedance
- Determine risk of overflow vs. peak capacity
- Estimated risk of public health and water quality impacts
- Determine risks of regulatory non-compliance
- Identify O&M issues
- Identify community and local agency concerns
- Evaluate coincident benefits
- Identify financing benefits

Table 5-3. Results of Application of Prioritization Criteria to Planned Conveyance Projects

I/I Project [1]	Project Name	Exceedance Year/Level of Service (LOS)/Sewered Growth				Prioritization Criteria						Coincident Benefit Comments	Table Key and Notes
		Year Exceeded	Estimated LOS in 2000	Sewered Area Growth [2] (2000 to 2010)	Population Growth [2] (2000 to 2010)	Risk of Overflow vs. Surcharge	Public Health and Water Quality Impacts	Risk of Non-Compliance Relative to Overflow Risk	O&M Issues	Community and Local Agency Concerns	Coincident Benefits		
Hidden Lake Planning Basin													
	Boeing Creek Storage Expansion	Before 2000	2–5 years [3]	2%	4%	Medium	Medium	Medium	No	None identified	No	None identified	
	Richmond Beach Storage	Before 2000	5–10 years [3]	3%	5%	Medium	Medium	Medium	No	None identified	No	None identified	
Northeast Lake Washington Planning Basin													
	North Mercer and Enatai Interceptor Parallels	Before 2000	2–5 years [4]	1%	8%	High	High	High	No	Increased zoning density in Mercer Island Central Business District	No	None identified	
	Bellevue Influent Trunk Parallel	Before 2000	2–5 years [5]	2%	27%	High	High	High	No	Increased zoning density in Bellevue Central Business District	Yes	Needed to convey peak flows to upgraded pump station	
	Factoria Pump Station and Trunk Diversion	Before 2000	5–10 years	10%	7%	Medium	Medium	Medium	No	None identified	No	None identified	
	Medina Storage	2009	>20 years			Low	Low	Low	No	None identified	No	None identified	
	Juanita Bay Pump Station Force Main Upgrade	2020	>20 years			Low	Low	Low	Yes	None identified	No	None identified	
North Green River Planning Basin													
Yes	South Renton Interceptor Parallel	2011	>20 years			Medium	Medium	Medium	No	None identified	No	None identified	
North Lake Sammamish Planning Basin													
	Lake Hills Trunk Replacement	Before 2000	2–5 years	2%	13%	High	High	High	No	None identified	No	None identified	
	Northwest Lake Sammamish Interceptor Parallel	Before 2000	2–5 years	2%	17%	High	High	High	No	Increased zoning density in Redmond Central Business District	Yes	Multiple transportation projects along alignment	

Key

Planning Basin

High Priority Projects (7 total)

Medium Priority Projects (6 total)

Lower Priority Projects (20 total)

Notes

(1) Implementation of the Regional I/I Control Program includes development of two or three initial I/I reduction projects from four possible project sites identified by the county and component agencies. Implementation will occur between 2007 and 2011. The I/I reduction projects are intended to eliminate the need for planned conveyance system improvements. Therefore, the conveyance system improvement projects associated with the identified I/I reduction projects have been given lower priority to allow adequate time to develop the initial I/I reduction projects and determine if I/I reduction successfully eliminated the need for the identified conveyance projects.

(2) Population and sewered area growth calculated for high and medium priority

Review Period

- Current schedule is for comments by September 16, 2016
- Comment by contacting Steve Tolzman at 206.477.5459 or steve.tolzman@kingcounty.gov to request a meeting with WTD staff to discuss conceptual projects or directly submit written comments