

Status Briefing: CSI Program Update and I/I Program

August 4, 2016



King County

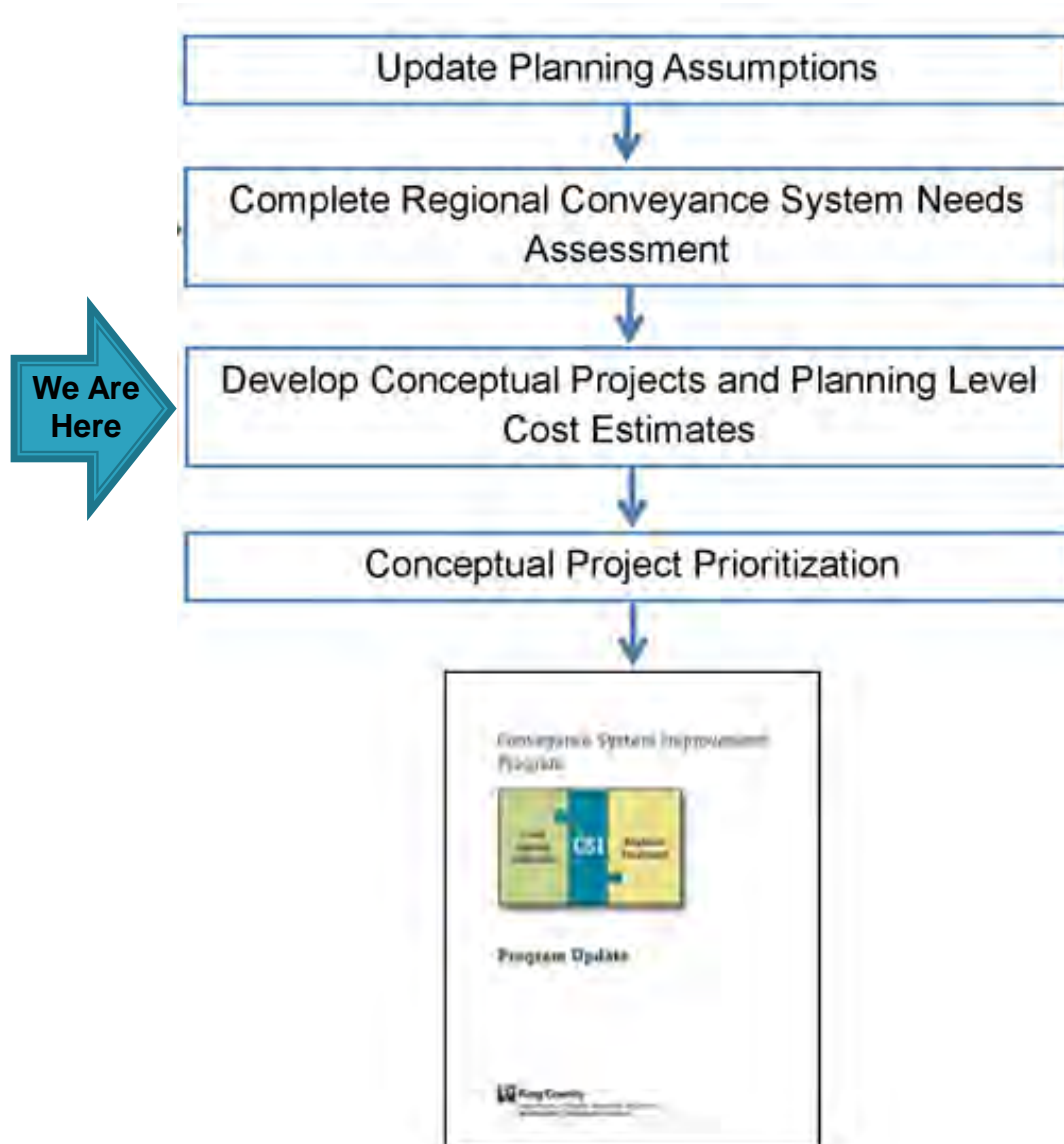
Department of Natural Resources and Parks
Wastewater Treatment Division



Presentation Topics

- ▶ CSI Program Update: conceptual projects to address identified conveyance system needs
- ▶ I/I Program: request for proposals for evaluation of I/I reduction concepts

Steps to Complete CSI Program Update



CSI Conceptual Project Document Ready for MWPAAC Review

- ▶ Review draft report contents:
 - Summary of process to develop conceptual projects.
 - 39 conceptual project descriptions
- ▶ Ongoing work:
 - Detailed documentation of cost estimates.

Example Conceptual Project Description

DRAFT Conceptual Projects to Meet Identified Capacity Needs
Northeast Lake Washington Planning Area

DRAFT Conceptual Projects to Meet Identified Capacity Needs
Northeast Lake Washington Planning Area

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)	2040 20-yr Peak Flow (mgd)	2040 20-yr Peak Flow Exceeded (mgd)	Year Exceeded	2010 Level of Service (v)
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	8.7
RE*MEDINA T-02C(1)	T-02C	T-02B	34	12 (x 2)	1963	8.29	8.69	0.41	2051	>20
RE*MEDINA T-02B(3)	T-02B	Medina	168	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 ± 1M)
RE*MEDINA T-18(8)	T-18 to T-11	Pipe replacement	Trench-cut	36	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 T-02B	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	168	15.8 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



Example of Detailed Cost Estimating Documentation

► Basis of Estimate

- Purpose
- Design Basis
- Planning Basis
- Cost Basis
- Allowances
- Assumptions
- Exclusions
- Risks

► Cost Estimate Detail

Conceptual Estimate - AACEI Class 5					
Project Name:	Lake Hills Interceptor Replacement Project: RO3-09(9)			Date:	5/2/2016
Location:	Northeast Lake Washington - City of Bellevue			Estimator:	Steve Toltzman
Description:	The Lake Hills Interceptor Replacement Project replaces 13,811 feet of the Lake Hills Interceptor with 60-in to 72-in pipeline. Construction is assumed to be trench-cut, with jack and bore creek and railroad crossings. Staged construction is recommended, as pipe reaches RE*LKHILLS.RO3-49(24) and RE*LKHILLS.RO3-09(9) are required by 2023 and 2049, respectively.			Version:	1
DIRECT: SUBTOTAL CONSTRUCTION COSTS					
Item No.	Item Description	Quantity	Units	Unit Cost	Item Cost
1	72-in Trench Cut Replacement (RO3-09 to RO2-49) - Pipe	1	LS	\$ 8,220,000.00	\$ 8,220,000.00
2	36-in Creek Crossing (RO3-03) - Culvert	1	LS	\$ 44,900.00	\$ 44,900.00
3	72-in Jack&Bore Railroad Crossing (RO3-01) - Jack and Bore	1	LS	\$ 621,000.00	\$ 621,000.00
4	60-in Trench Cut Replacement (RO3-49 to RO3-25) - Pipe	1	LS	\$ 11,900,000.00	\$ 11,900,000.00
5	60-in Jack&Bore Creek Crossing (RO3-31) - Jack and Bore	1	LS	\$ 565,000.00	\$ 565,000.00
6	60-in Jack&Bore Creek Crossing (RO3-40) - Jack and Bore	1	LS	\$ 565,000.00	\$ 565,000.00
7				\$	-
8				\$	-
9				\$	-
10				\$	-
11				\$	-
12				\$	-
13				\$	-
14				\$	-
15				\$	-
16				\$	-
17				\$	-
18				\$	-
19				\$	-
20				\$	-
21				\$	-
22				\$	-
23				\$	-
24				\$	-
25				\$	-
Subtotal Construction Costs					\$ 21,920,000.00
DIRECT: SUBTOTAL ADDITIONAL CONSTRUCTION COSTS					
Street Use Permit					\$ -
Mitigation Construction Contracts					\$ -
Allowance for Indeterminates (Design Allowance)					\$ 5,480,000.00
Subtotal Construction Bid Opening Amount					\$ 27,400,000.00
Owner Furnished Equipment					\$ -
Outside Agency Construction					\$ -
Construction Contract/OFE Change Order Allowance					\$ 2,740,000.00
Subtotal KC Contribution to Construction					\$ 30,140,000.00
Sales Tax					\$ 2,893,440.00
DIRECT: SUBTOTAL OTHER CAPITAL CHARGES					
KC/WTD Direct Implementation					\$ -
Misc. Capital Costs					\$ 84,392.00
TOTAL DIRECT CONSTRUCTION COSTS					\$ 33,120,000.00
INDIRECT: NON-CONSTRUCTION COSTS					
Engineering Services					\$ 6,630,800.00
Planning & Management Services					\$ 2,712,600.00
Permitting & Other Agency Support					\$ 376,750.00
Right-of-Way					\$ -
Misc. Service & Materials					\$ 994,620.00
Non-WTD Support					\$ 467,170.00
WTD Staff Labor					\$ 3,456,003.10
Subtotal Non-Construction Costs					\$ 14,637,943.10
Project Contingency					\$ 14,326,732.53
Initiatives					\$ 376,750.00
TOTAL INDIRECT NON-CONSTRUCTION COSTS					\$ 29,340,000.00
TOTAL PROJECT COST					\$ 62,460,000.00

Review Period

- ▶ Comments accepted through 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

I/I Program

- ▶ Status of RFP for Evaluation of I/I Reduction Concepts
 - Incorporated comments on scope of work
 - Developing proposal evaluation criteria
 - Expect to advertise in 3–6 weeks



For additional information or questions, please contact:

Steve Tolzman, Project Manager
Wastewater Treatment Division
206.477.5459
Steve.Tolzman@kingcounty.gov