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# **Conveyance System Improvement Program Update**

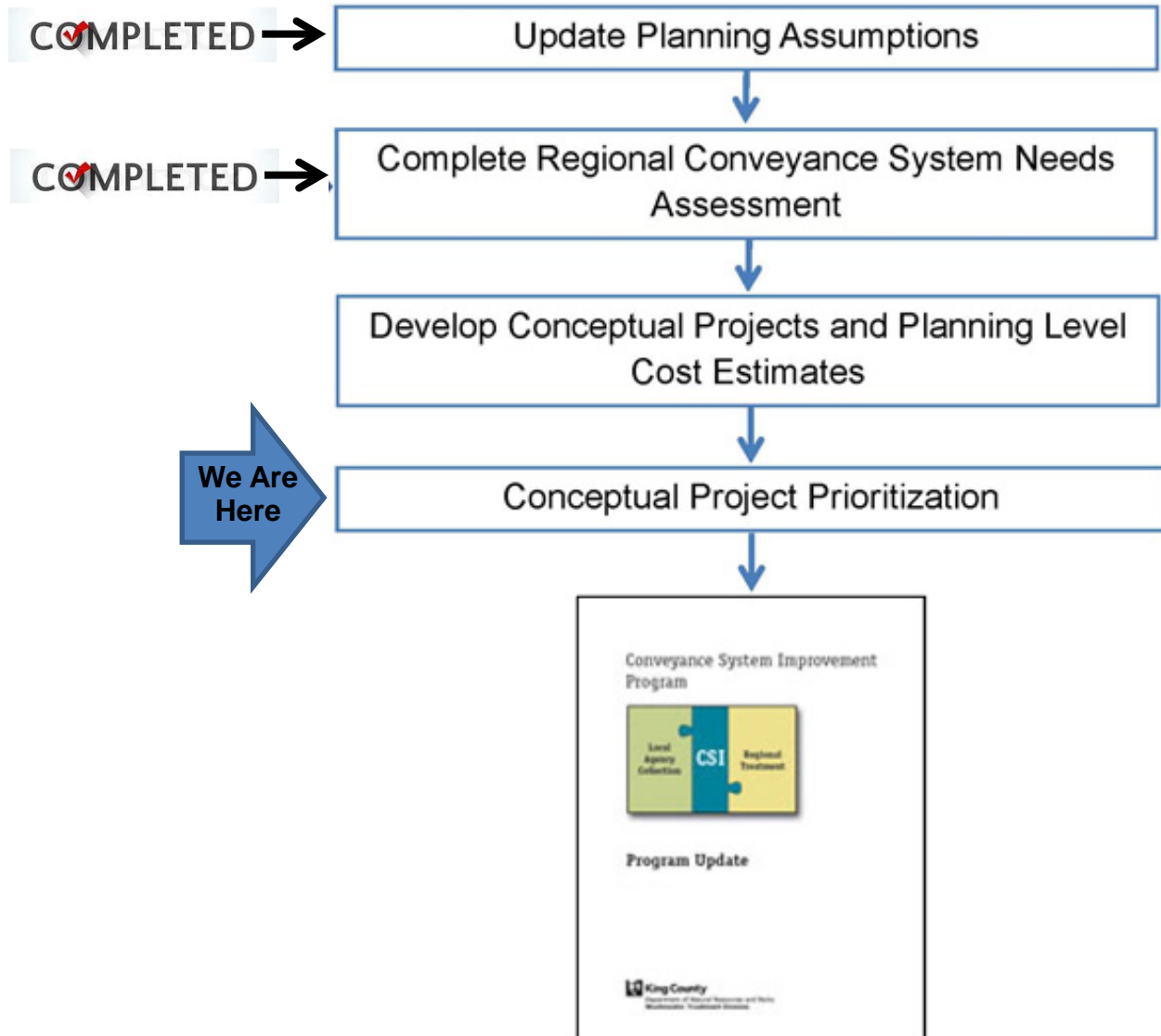
## **Status Report**

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**January 2017**



# CSI Program Update Process



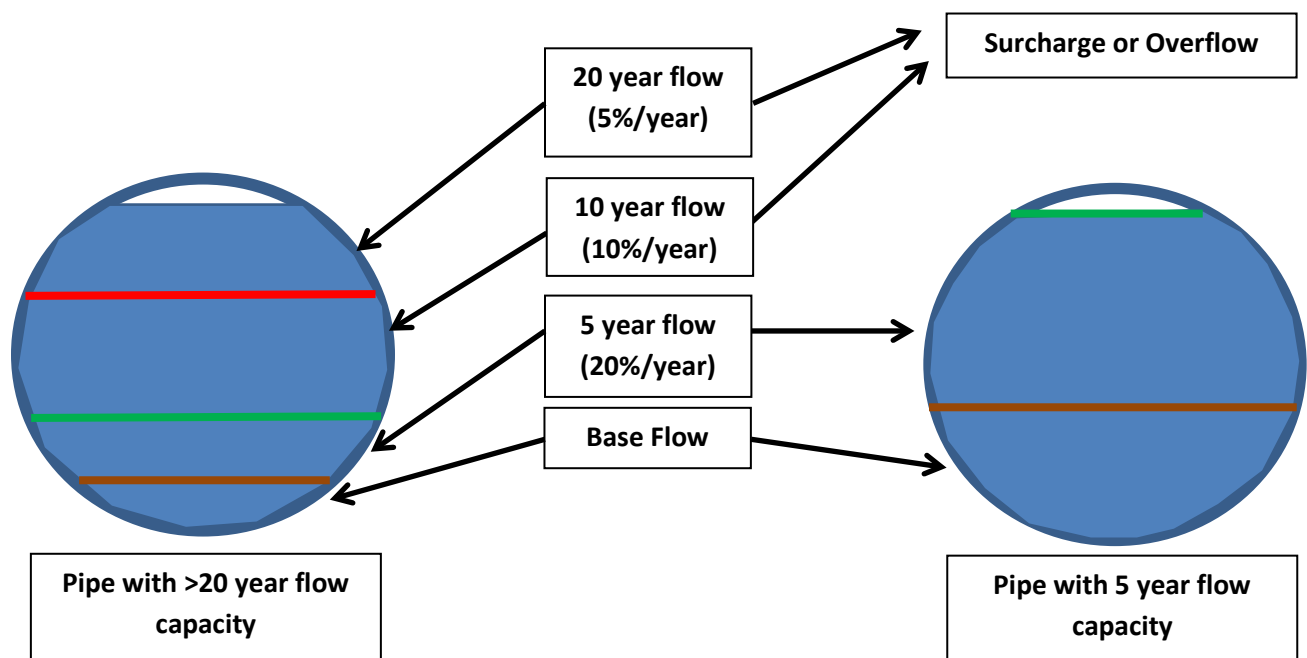
## **Briefing Topics**

1. 2017 CSI Project Prioritization Criteria
2. Initial Recommended Prioritization
3. Prioritization Considerations
4. Recommendation

## 2017 CSI Project Prioritization Criteria

- Level of Service
  - High Priority = 2010 LOS < 5 or 2030 LOS < 2
  - Medium Priority = LOS between 5 and 10 in 2010 or between 2 and 5 in 2030
  - Low Priority = LOS >10 in 2010 or >5 in 2030
- O&M Issues
- Community and Local Agency Input (such as development activity that affects capacity demand)
- Coincident Benefits (such as partnering with transportation or other capital projects)

## Pipe Flow Recurrence Intervals in Years and Level of Service



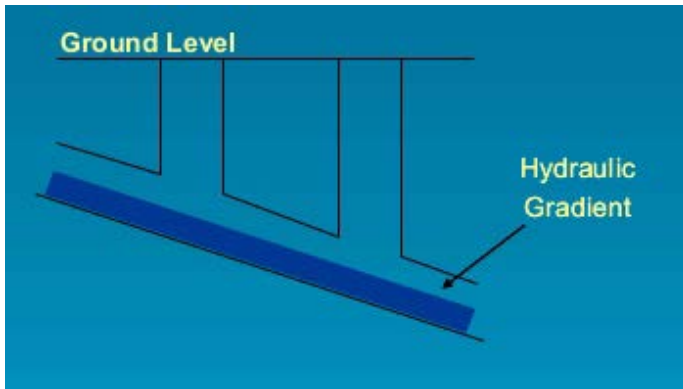
### Initial 2017 CSI Project Prioritization Recommendation

**Yellow** = High Priority   **Green** = Medium Priority   **White** = Low Priority

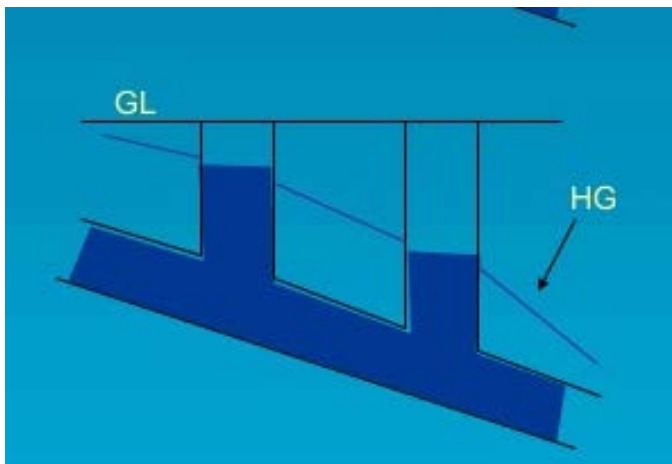
Project Name	In 2007 CSI Program Update	Estimated Total Project Cost (M 2016\$)	Sewered Area Growth (2010 to 2030)	Sewered Population Growth (2010 to 2030)	Pk 20-yr Flow 2010 <i>mgd</i>	Pk 20-yr Flow 2030 <i>mgd</i>	Pk 20-yr Flow Increase (2010 to 2030)	Level of Service 2010	Level of Service 2030	O& M Issue s
North Lake Washington Planning Area										
North Creek Trunk Storage and Replacement (2 Phases)	Yes	P1=25.6/P2=51.7 <sup>1</sup>	30.8%	24.0%	23.6	29.4	24.9%	6-10 years	2-5 years	Y
Swamp Creek Trunk Extension Replacement	Yes	15.3	38.5%	39.6%	15.3	20.3	32.8%	11-20 years	2-5 years	N
Lake Ballinger Storage	No	74.9	1.4%	35.5%	16.9	19.4	14.7%	11-20 years	2-5 years	N/A <sup>2</sup>
McAler Creek Trunk Replacement	No	3.85	2.4%	35.0%	18.0	21.8	21.3%	11-20 years	6-10 years	N
Hidden Lake Planning Area										
Richmond Beach Pump Station Upgrade	Yes	29.8	2.7%	32.6%	15.9	18.2	14.1%	<2 years	< 2 years	Y
Richmond Beach Force Main Parallel	Yes	11.1	2.7%	32.6%	15.9	18.2	14.1%	6-10 years	2-5 years	UNK <sup>3</sup>
Richmond Beach – Edmonds Interceptor Parallel	Yes	12.4	4.5%	33.0%	16.9	19.4	14.8%	<2 years	< 2 years	N
Boeing Creek Trunk Replacement and Parallel	Yes	8.35	2.7%	32.6%	8.0	9.3	15.3%	2-5 years	< 2 years	N
Hidden Lake Pump Station Upgrade	No	8.96	1.5%	42.6%	8.4	9.5	13.8%	6-10 years	2-5 years	N
Hidden Lake Force Main Replacement	No	5.61	1.5%	42.6%	8.4	9.5	13.8%	6-10 years	2-5 years	UNK <sup>3</sup>
Northwest Lake Washington Planning Area										
Thornton Creek Trunk Replacement and Diversion	Yes	33.9	0.5%	17.2%	60.1	68.2	13.4%	<2 years	< 2 years	N
North Lake City Trunk Replacement, Realignment, and Rehabilitation	No	44.1	0.3%	18.6%	42.1	47.8	13.5%	11-20 years	6-10 years	Y
Northeast Lake Washington Planning Area										
Medina Trunk Replacement	Yes	12.2	1.9%	16.6%	6.4	7.3	14.1%	6-10 years	2-5 years	N
Medina Siphon Replacement	Yes	11.8	1.9%	16.6%	6.7	8.0	19.2%	6-10 years	2-5 years	UNK <sup>3</sup>
Factoria Trunk Diversion	Yes	15.4	10.9%	10.8%	5.7	6.6	15.6%	6-10 years	2-5 years	N
Lake Hills Interceptor Replacement	No	62.1	23.7%	31.9%	39.3	50.2	27.7%	11-20 years	2-5 years	Y
North Mercer Pump Station Upgrade	Yes	7.68	0.8%	17.8%	7.8	8.9	13.4%	11-20 years	6-10 years	N
Kirkland Pump Station Upgrade	No	10.8	0.4%	27.5%	8.8	10.0	13.7%	>20	11-20 years	N
Medina Pump Station Upgrade	No	10.6	1.9%	16.6%	9.2	10.4	14.1%	>20	>20	Y
Yarrow Bay Pump Station Replacement	No	16.3	0.9%	32.8%	5.9	6.7	14.2%	2-5 years	2-5 years	Y
Sweyolocken Pump Station Upgrade	No	9.37	1.4%	43.6%	17.9	20.7	15.8%	>20	>20	N
Eastside Interceptor Section 8 Storage	No	101	13.0%	34.0%	147.0	176.0	19.8%	>20	>20	N
South Lake Sammamish Planning Area										
Sammamish Plateau Diversion	Yes	194	71.8%	49.6%	21.1	29.6	40.1%	>20	11-20 years	N/A <sup>4</sup>
Eastgate Trunk Replacement	Yes	7.06	31.8%	36.3%	22.4	31.7	41.5%	>20	6-10 years	Y
Issaquah Interceptor Section 2 Replacement	Yes	3.42	34.7%	47.3%	4.1	5.5	32.7%	>20	>20	N
Issaquah Highlands Storage	Yes	6.22	21.3%	41.7%	4.3	5.2	21.2%	>20	>20	N
South Lake Washington Planning Area										
Eastside Interceptor Section 1 Replacement	No	195	13.9%	31.8%	196.1	234.2	19.4%	11-20 years	6-10 years <sup>5</sup>	N
Bryn Mawr Trunk Storage	Yes	20.5	2.6%	17.8%	13.3	15.2	13.8%	11-20 years	11-20 years	N
Cedar River Interceptor Section 2 Replacement	No	7.74	29.8%	31.7%	26.0	31.7	21.5%	>20	11-20 years	N

Project Name	In 2007 CSI Program Update	Estimated Total Project Cost (M 2016\$)	Sewered Area Growth (2010 to 2030)	Sewered Population Growth (2010 to 2030)	Pk 20-yr Flow 2010 <i>mgd</i>	Pk 20-yr Flow 2030 <i>mgd</i>	Pk 20-yr Flow Increase (2010 to 2030)	Level of Service 2010	Level of Service 2030	O& M Issue s
Cedar River Interceptor Section 1 Replacement	No	15.9	29.4%	31.8%	27.3	33.2	21.6%	>20	>20	N
North Green River Planning Area										
Tukwila Freeway Crossing Replacement	No	22.8	10.1%	33.1%	9.4	10.8	14.4%	2-5 years	<2 years	N
Tukwila Interceptor Replacement	No	27.2	15.6%	62.1%	11.7	14.3	21.6%	>20	11-20 years	N
South Renton Trunk Replacement	Yes	8.63	12.5%	19.0%	5.6	6.6	17.9%	>20	>20	N
Rainier Vista Interceptor South Replacement	No	3.73	8.8%	32.2%	7.7	9.1	17.4%	>20	>20	N
North Soos Creek Trunk Replacement	No	5.95	35.9%	54.9%	2.7	3.5	30.8%	>20	>20	N
South Green River – Kent										
Garrison Creek Interceptor Replacement, Realignment, and Diversion	Yes	49.2	18.7%	40.0%	8.2	10.0	21.6%	2-5 years	2-5 years	Y
Auburn Interceptor Sections 1, 2, and 3 Replacement	Yes	255	44.8%	36.1%	50.7	71.4	41.0%	>20	>20	Y
South 277 <sup>th</sup> Interceptor Replacement	No	7.43	#N/A	#N/A	20.9	30.3	45.2%	>20	>20	N
West Hill Trunk Diversion	No	6.63	16.4%	19.2%	9.7	11.4	17.4%	11-20 years	6-10 years	N
South Green River – Soos Creek										
Black Diamond Pump Station Upgrade	Yes	1.37	<10%	<10%	0.4	0.9	108.0%	>20	>20	Y
Black Diamond Trunk Storage and Replacement (2 Phases)	Yes	P1=22.2/P2=60.3 <sup>1</sup>	214.6%	156.0%	1.9	3.9	108.0%	11-20 years	<2 years	N
Notes: 1. P1 = Total Cost Estimate for Phase 1, P2 = Total Cost Estimate for Phase 2. 2. Storage Project would not result in opportunity to coordinate with O&M needs therefor not applicable. 3. No facility condition available due to lack of access to inspect facility. 4. Proposed project to address need would install pipe in area where not WTD asset currently exists therefore O&M needs are not applicable. 5. After ESI Section 8 Storage is on-line 2030 capacity increases to 11-20 years.										

## Analysis of Surge vs Overflow in Conveyance System with High Priority Projects



No Surge



**Surcharge Analysis:**  
Assessed capacity of pipe  
with surcharge to local  
agency connection invert  
elevation or King County  
pipe crown.

## Results of Surge Analysis for High and Medium Priority Projects

Project Name	Pipe Full Level of Service 2010	Surcharge Level of Service 2010
Richmond Beach Pump Station Upgrade	<2 years	<2 years <sup>1</sup>
Richmond Beach - Edmonds Interceptor Parallel	<2 years	<2 years
Boeing Creek Trunk Replacement and Parallel	2-5 years	2-5 years <sup>1</sup>
Thornton Creek Trunk Replacement and Diversion	<2	2-5 years
Yarrow Bay Pump Station Replacement	2-5 years	2-5 years <sup>1</sup>
Tukwila Freeway Crossing Replacement	2-5 years	11-20 years
Garrison Creek Interceptor Replacement, Realignment, and Diversion	2-5 years	>20
Black Diamond Trunk Storage and Replacement	5-10 years	>20
North Creek Trunk Storage and Replacement	5-10 years	5-10 years
Swamp Creek Trunk Extension Replacement	11-20 years	>20
Lake Ballinger Storage	11-20 years	11-20 years <sup>1</sup>
Richmond Beach Force Main Parallel	6-10 years	6-10 years <sup>1</sup>
Hidden Lake Pump Station Upgrade	6-10 years	6-10 years <sup>1</sup>
Hidden Lake Force Main Replacement	6-10 years	6-10 years <sup>1</sup>
Medina Trunk Replacement	6-10 years	>20
Medina Siphon Replacement	6-10 years	6-10 years <sup>1</sup>
Factoria Trunk Diversion	6-10 years	6-10 years <sup>1</sup>
Lake Hills Interceptor Replacement	11-20 years	11-20 years
Notes:		
1. Surcharging not applicable in pump stations, force mains, and pressure sewers.		



## **Recommendations regarding surcharging and high priority projects**

- Initiate capital projects for high priority capacity needs where surcharge analysis shows the limited additional capacity gained by surcharging. Expected projects for implementation are:
  - 2019 - Thornton Creek Trunk Replacement and Diversion
  - 2020 - Yarrow Bay Pump Station Replacement
- Install flow level measurement monitors (see below for example) in addition to flow verification meters at high priority project areas in high priority capacity needs areas. Level sensors would allow measuring surcharging events and level of surcharge.
- Assess flow monitoring and level sensor data collected between 2017 and 2019 as part of the determination on which high priority projects to move forward in 2021+.
- Continue coordination with Operations and Asset Management on facilities with identified operations and maintenance issues to ensure any work done takes capacity needs into consideration.



**Flow Level Measurement Monitor Example Installation**

## **Next Steps**

- Further discussion of prioritization at February E&P meeting
- Final Draft of Conceptual Projects Report available by February E&P meeting
- Incorporate comments on prioritization
- Finalize CSI Program Update and prepare report