CONVEYANCE SYSTEM IMPROVEMENT PLAN UPDATE

UPDATED PLANNING ASSUMPTIONS FOR WASTEWATER FLOW FORECASTING

MWPAAC General Meeting December 11, 2024



Department of Natural Resources and Parks Wastewater Treatment Division

Purpose

- Provide an overview of the Conveyance System Improvement (CSI) Plan Update process
- Discuss the updated planning assumption recommendations
- Gather input and feedback from MWPAAC by March 2025 on the updated planning assumption recommendations

Background

Purpose of the CSI Program:

- Ensuring the King County wastewater conveyance system has sufficient capacity to protect public health and the environment
- Ensuring that the system has sufficient capacity to serve regional growth

Purpose of the CSI Plan Update:

 Verifies, adjusts, and identifies new CSI projects needed for increasing capacity in the conveyance system to accommodate future flow from both the growth in population and infiltration and inflow



CSI Plan Overview

- CSI Plan last updated in 2017
- King County policy calls for periodic updates
- Updates to include:
 - Flow Projections
 - Rate of Growth
 - Growth Patterns
- The next CSI Plan update is currently underway and will be incorporated into the RWSP Update





Planning Assumptions – Background

Eight key planning assumptions:

- Design Flow
- Planning Horizon
- Future Service Area
- Water Conservation

Today's meeting

- Sewered Area Growth Rate
- Future Population
- I/I Degradation
- New Construction I/I

Oct 3 E&P meeting

Feb 6 E&P meeting

Used to:

- Identify future conveyance capacity and treatment needs to inform conveyance, treatment, and RWSP Update planning
- Guide decision on timing and sizing of facilities
- Prevent under or over building of facilities

Components of Future Flows

Planning Assumptions

I/I Degradation

New Construction I/I

Sewered Area Growth Rate

Future Service Area

Water Conservation

Future Population



Planning Assumptions

- Design Flow (follow up)
- Planning Horizon
- Future Service Area
- Water Conservation

- Sewered Area Growth Rate
- Future Population
- I/I Degradation
- New Construction I/I

Assumption: Design Flow – Follow Up

- Updated Assumption: The 20-year peak flow standard per King County Code 28.86.060
- **E&P Discussion:** What are the implications of WTD's design standard not matching the component agencies?
- **E&P Discussion:** Has the 20-year storm become more intense over time?

Planning Assumptions

- Design Flow
- Planning Horizon
- Future Service Area
- Water Conservation (*follow up*)

- Sewered Area Growth Rate
- Future Population
- I/I Degradation
- New Construction I/I

Assumption: Water Conservation – Follow Up

Updated Assumption: 5% reduction per decade between 2020 and 2040. No additional reduction beyond 2040

E&P Discussion: Has WTD compared predicted wintertime water use with actual summer-time dry weather flow?

	2020 Residential (gallons per capita per day)	2020 Commercial (gallons per employee per day)	2020 Industrial (gallons per employee per day)
West Point	39	25	53
South Plant	52	19	48
Brightwater	45	16	27

Assumption: Water Conservation – Follow Up (Cont.)

	2020 Average Dry Weather Flow (MGD)	2020 Base Wastewater Flow (MGD)		2010 Average Dry Weather Flow (MGD)	2010 Base Wastewater Flow (MGD)
West Point	63	44	West Point	65	47
South Plant	69	54	South Plant	57	47
Brightwater	19	17	Brightwater	14	13

Planning Assumptions

- Design Flow
- Planning Horizon
- Future Service Area
- Water Conservation

- Sewered Area Growth Rate
- Future Population
- I/I Degradation
- New Construction I/I

Assumption: Sewered Area Growth Rate

Description: The rate of increase in areas served by sewers, either through new development or conversion of septic systems to sewers

Applied to: Wastewater flow projections (used to estimate residential population served and to model current and future base wastewater flows and I/I into the system)

Previous Assumptions:

2007 CSI Program	2017 CSI Program
Update Assumption	Update Assumption
90% of potentially sewerable areas in 2000 would be sewered by 2030 and 100% by 2050	20% of the 2010 potentially sewerable area will be sewered each decade until 100% is sewered by 2060



Model Basin Delineation

- Delineated to quantify flow contributed by local sewer systems to various portions of King County's conveyance system
- Determined by placement of flow meters installed during the 2020 Decennial Flow Monitoring
- Basins consist of an average of 1000 sewered acres and 100,000 linear feet of pipe

Sewerland

- Classification of service area between three categories:
 - Sewered currently sewered
 - Sewerable can be sewered in the future
 - Unsewerable cannot be sewered in the future
- Model inputs:
 - Comprehensive plans
 - Local sewer data
 - Parcel data
 - Building footprint data
 - Aerial photography



Sewerland Analysis

- Compared the 2020 dataset to the 2010 dataset
- Systemwide rate of increase in sewered area:
 - ~8% increase from 2010 to 2020
 - 2010 118,000 acres
 - 2020 127,000 acres



Sewerland Analysis (Cont.)

- Rate of conversion from sewerable to sewered:
 - 11% decrease in sewerable area between 2010-2020
- Rate of conversion was lower than previous decade and 2017 CSI Plan Update assumption



Recommendation: Sewered Area Growth Rate

Updated Assumption: 12.5% of the 2020 potentially sewerable area will be sewered each decade.



Planning Assumptions

- Design Flow
- Planning Horizon
- Future Service Area
- Water Conservation

- Sewered Area Growth Rate
- Future Population
- I/I Degradation
- New Construction I/I

Assumption: Future Population

Description: The projected future sewered population and employment within WTD's service area

Applies to: Wastewater flow projections (future projections of base sewage flow)

Previous Assumptions:

2007 CSI Program Update	2017 CSI Program Update
Assumption	Assumption
2003 Puget Sound Regional Council	2013 PSRC population and
(PSRC) population and employment	employment forecasts allocated to
forecasts allocated to sewer basins	sewer basins

Puget Sound Regional Council (PSRC) Population and Employment Projections

- Land Use Vision-Implemented Targets (LUV-it) Land Use Forecast Product developed in May 2023
- Based on Vision 2050 and adopted 2044 countywide growth targets
- Baselined in 2020 using Census estimates
- PSRC aggregated parcel results to King County's sewer basins



PSRC Forecast Comparison



*Based on total population for King, Pierce, and Snohomish Counties

Sewered Residential Population Forecast



Sewered population based on regional treatment plants (West Point, South Plant, and Brightwater)

Sewered Residential Population Forecasts by Treatment Plant



Recommendation: Future Population

Updated Assumption: 2023 PSRC population and employment forecasts allocated to sewer basins. Assume straight line extrapolation from PSRC forecast data to produce forecasts for 2060 and 2070



Planning Assumption Briefing Schedule

Additional briefings to discuss remaining updated planning assumptions

Date	Topics
February 6, 2025	I/I Degradation, New Construction I/I
TBD	Follow-up discussion

Questions?

For additional information or questions, please contact:

Ryan Bylsma, Separated Conveyance Program Manager <u>rbylsma@kingcounty.gov</u> 206-263-8293