

Regional Wastewater Services Plan and Conveyance System Improvement Program Planning Assumptions



PRESENTED TO:
ENGINEERING AND PLANNING SUBCOMMITTEE OF
THE METROPOLITAN WATER POLLUTION
ABATEMENT ADVISORY COMMITTEE
JUNE 6, 2013



King County

Department of Natural Resources and Parks
Wastewater Treatment Division

Schedule for Briefings with E&P



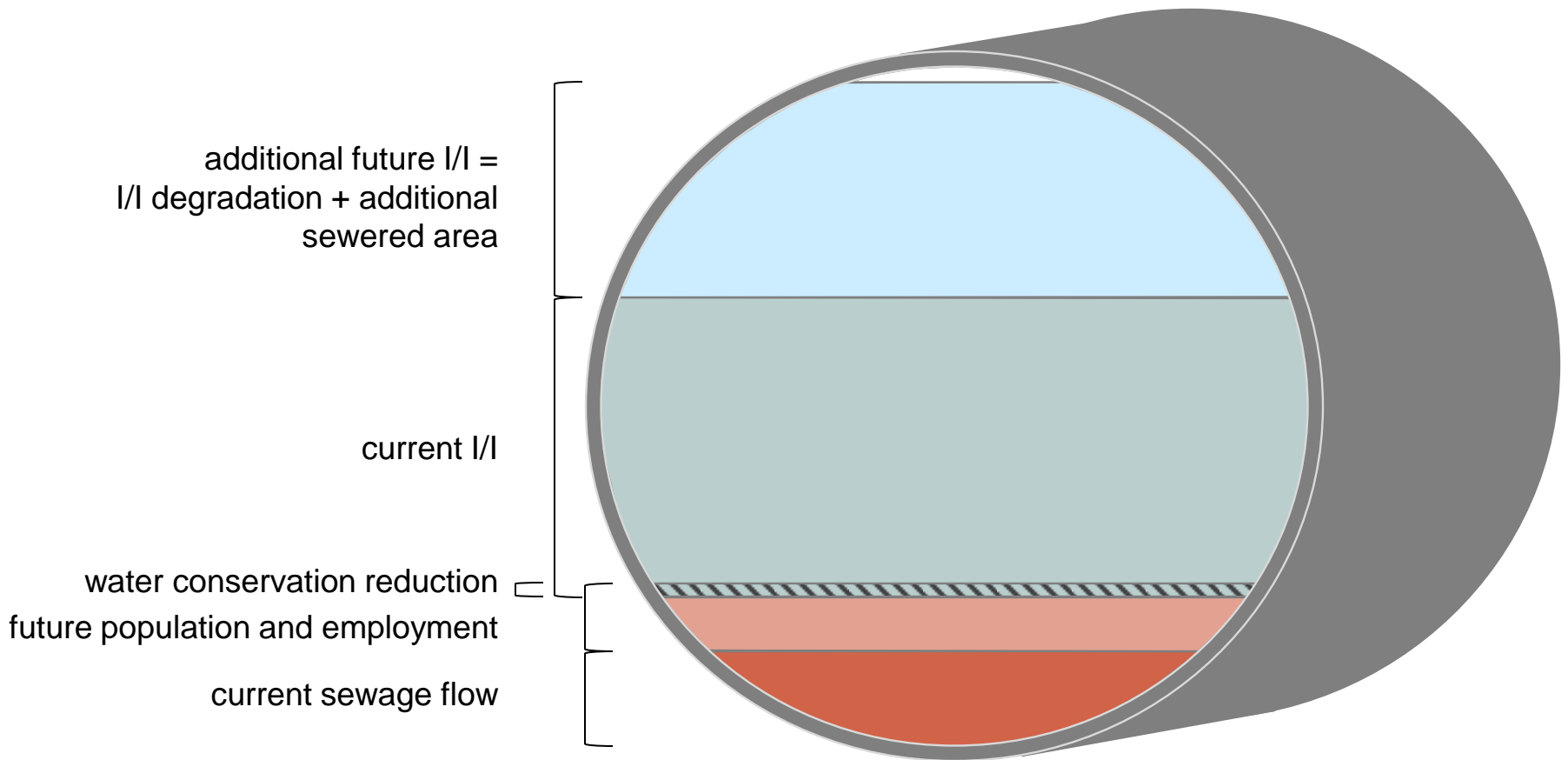
Date	Planned Topic
May 2, 2013	Overview of process to update planning assumptions
June 6, 2013	Future population, planning horizon, and water conservation assumptions
August 1, 2013	Sewered area growth rate and average wet-weather I/I degradation rate
September 5, 2013	Follow-up from August 1 discussion
October 3, 2013	Peak I/I and new system I/I degradation rate
November 7, 2013	Follow-up from October 3 and other meetings as needed

Today's Presentation



- Discussion of WTD recommended updates to planning assumptions including:
 - Overview of estimating future flows
 - Future population
 - Planning horizon
 - Water use
 - Water conservation
- Next steps

Components of Future Flows



Assumption: Future Population



Previous Assumption: Based on PSRC 2003 population and employment forecast to 2030.

Used for: future projections of the base sewage flow.

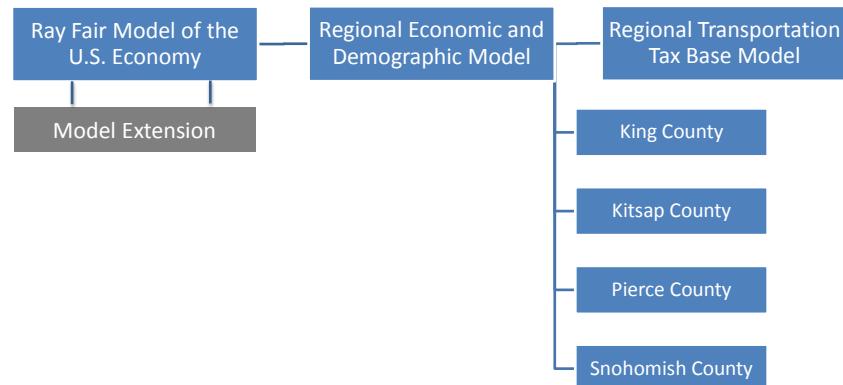
Process to update: Allocate PSRC 2013 forecast for 2020, 2030, and 2040 to sewer model basins. Apply straight line extrapolation of the growth rate out to 2060.



PSRC Regional Forecasting

- **Economic Forecast model**
 - Determines regional population and employment
 - Based on Ray Fair National Economic model
 - ✦ The Ray Fair model includes assumptions about the US economy
 - ✦ Contraction of US Federal spending after 2020

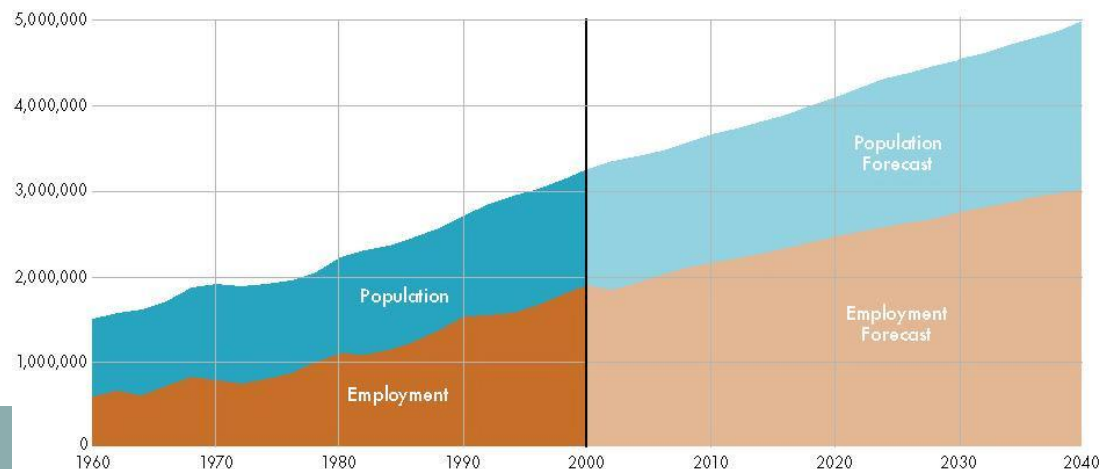
Regional Economic Model Data Flow



UrbanSim: Parcel Based Land Use Model

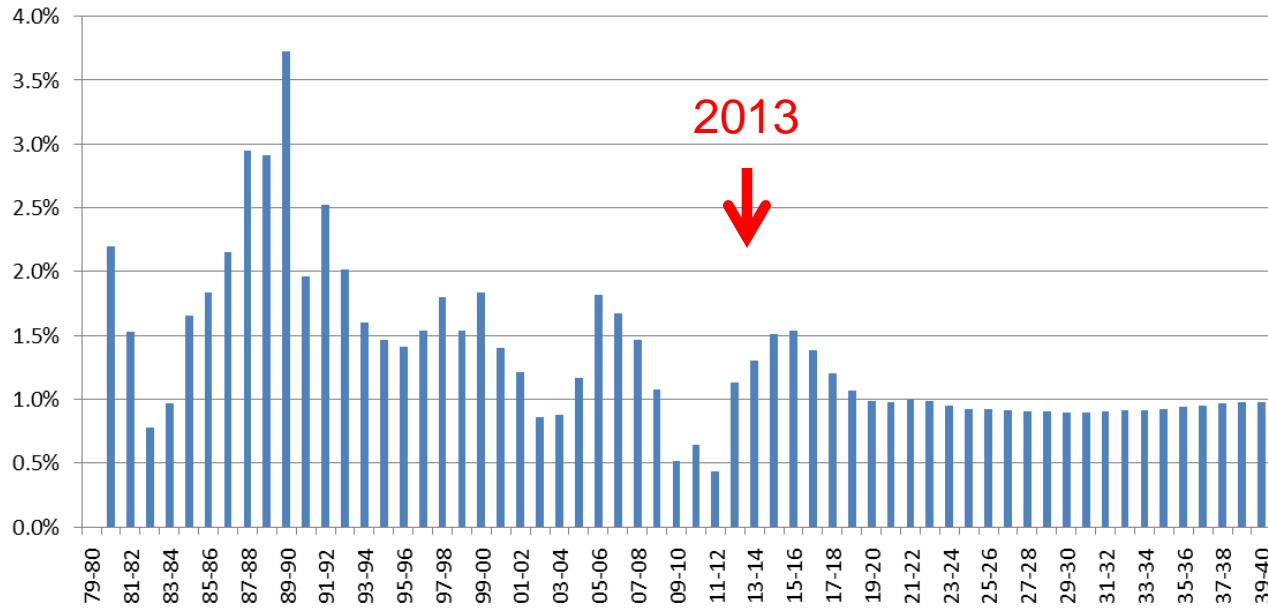


- Simulates the location decisions for each household and job in the region
- interacts with PSRC's travel models to simulate the impacts of land use on transportation, and vice-versa
- Relies on existing/future zoning (maximum density) from local comprehensive plans
- PSRC aggregated parcel results to King County's sewer basins

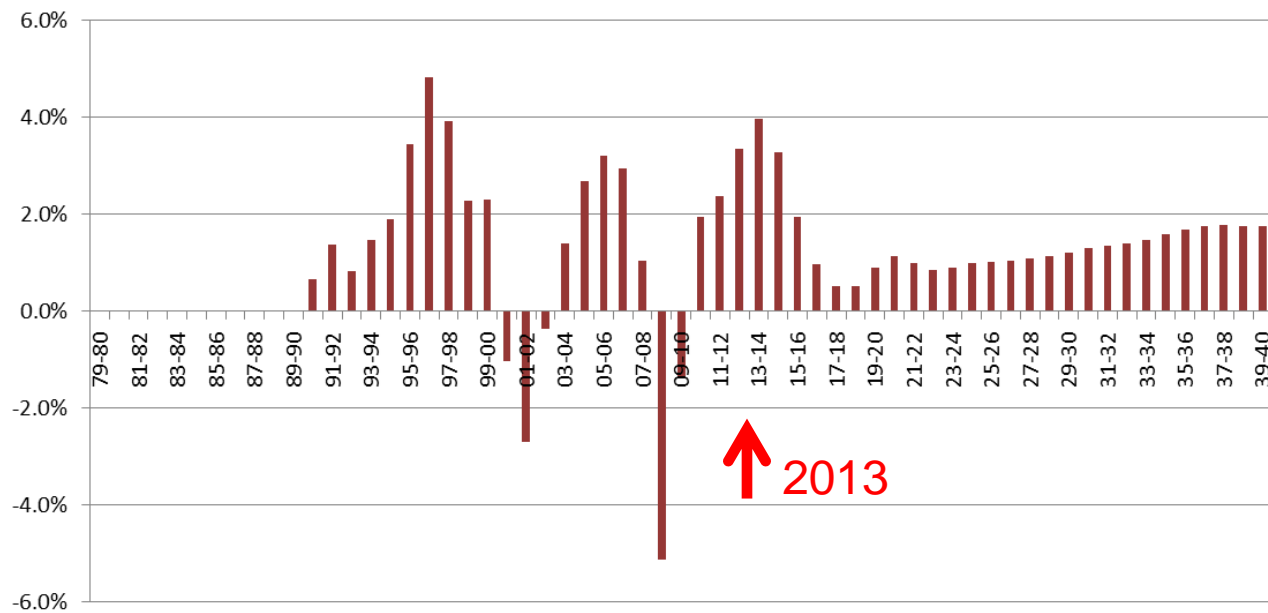


PSRC Projections - Four County Region

Total Population Growth Rate



Wage and Salary Employment Growth Rate

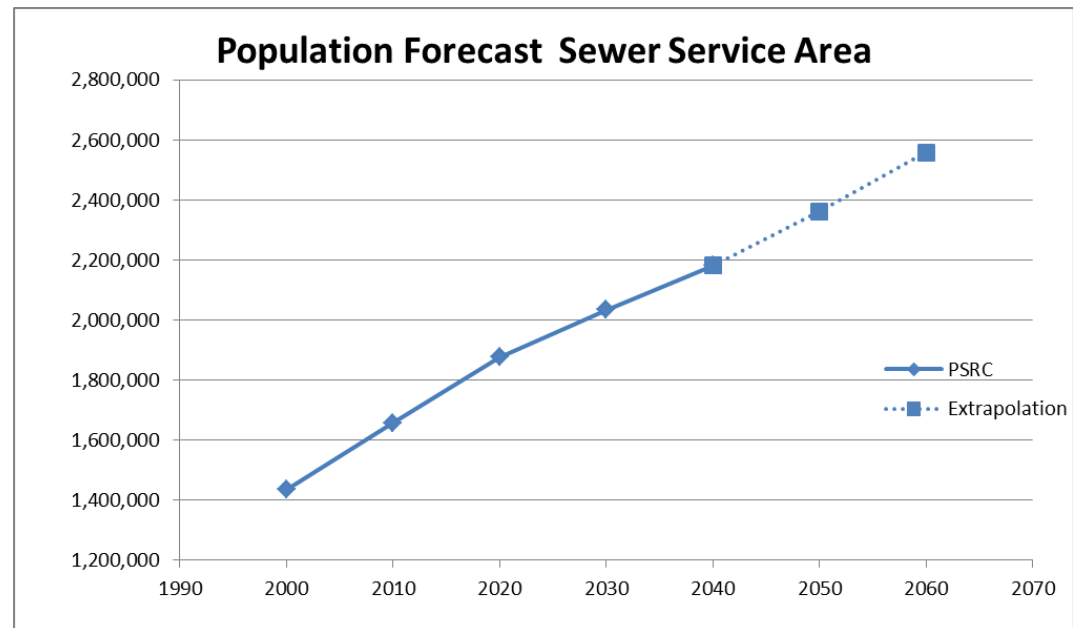


Assumption: Future Population

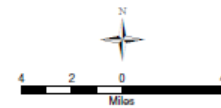
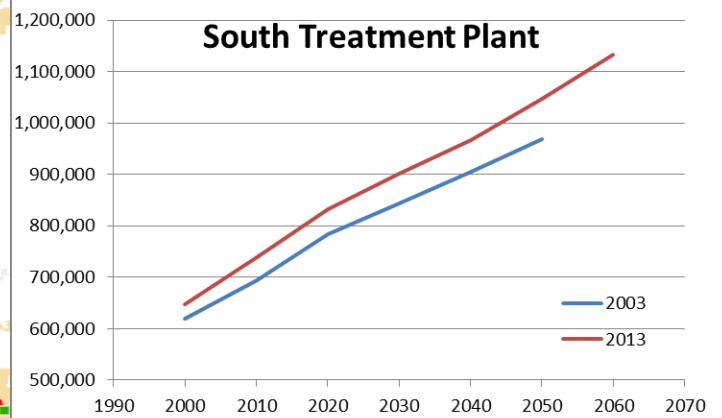
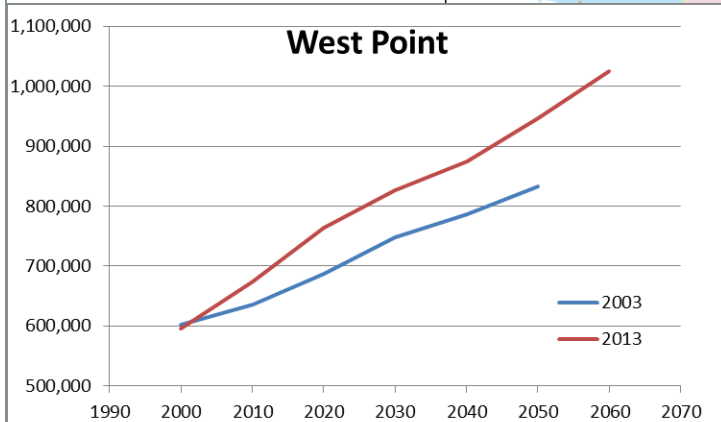
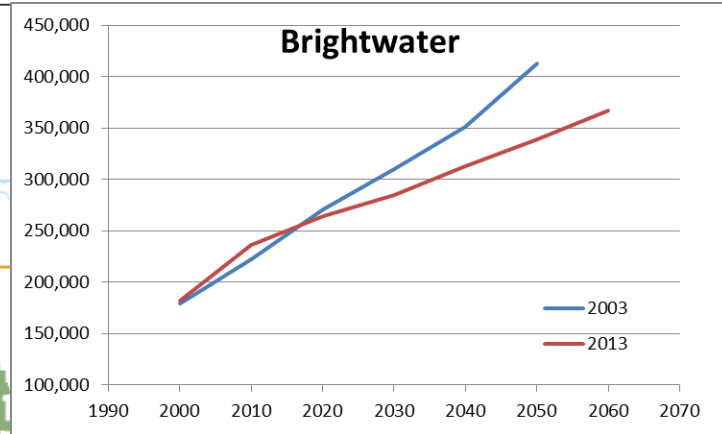
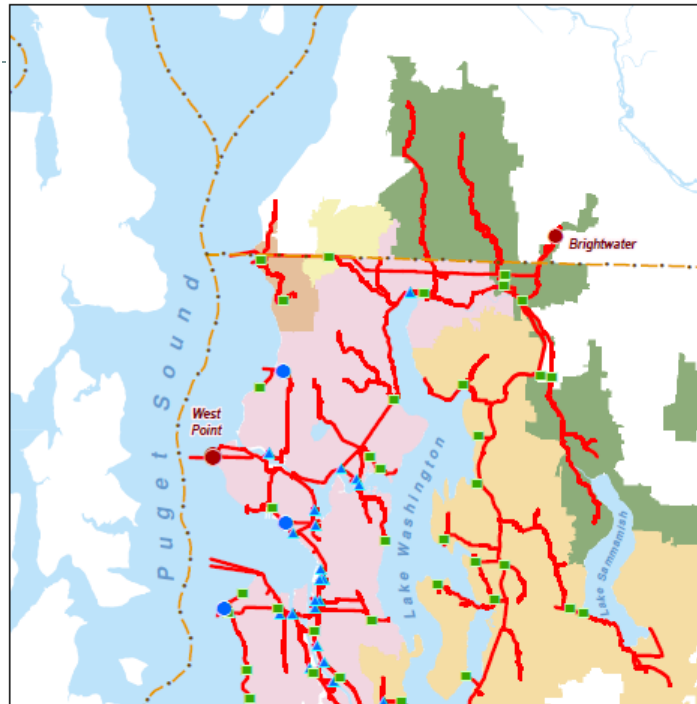


Analysis: PSRC provided (draft) population and employment forecast to 2040. WTD staff discussed options for extrapolating forecast data beyond 2040 with PSRC.

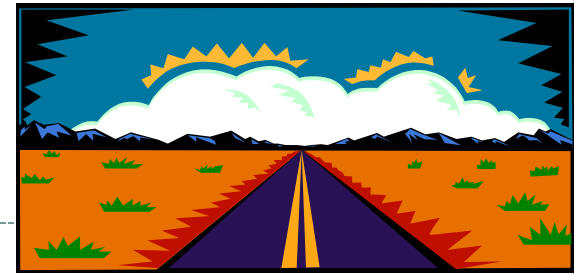
Proposed Assumption: Allocate PSRC 2013 forecast for 2020, 2030, and 2040 to sewer model basins. Apply straight line extrapolation of the growth rate out to 2060.



Population Estimates



Assumption: Planning Horizon



Previous Assumption: The year 2050 is used to represent the projected date that the regional wastewater service area will be fully built out and all sewerable portions of the service area will be connected into the wastewater system.

Used for: Estimating future flow components in order to determine facility size.

Proposed Assumption: Use a 50-year planning horizon; estimate capacity needs in 2060, based on population, employment, and results of sewerage area growth rate analysis.



Assumption: Water Conservation



Previous Assumption: A 10 percent reduction in per capita water consumption between 2000 and 2010, with no additional reduction after 2010.

Applied to: Wastewater flow projections

Process to update: Collect and review indoor water consumption data for 2010. Review local agency water system plans.



Water Usage Data



Analyzed Data from:

- Alderwood Water and Wastewater District
- City of Auburn
- City of Bellevue
- Cascade Water Alliance
- City of Kent
- King County Industrial Waste
- City of Renton
- Seattle Public Utilities
- Soos Creek Water & Sewer District

Reviewed water/sewer comprehensive plans:

- City of Bellevue
- Cascade Water Alliance
- Cedar River Water & Sewer District
- City of Kent
- City of Kirkland
- Northshore Utility District
- City of Redmond
- City of Renton
- Soos Creek Water & Sewer District

Current Water Consumption

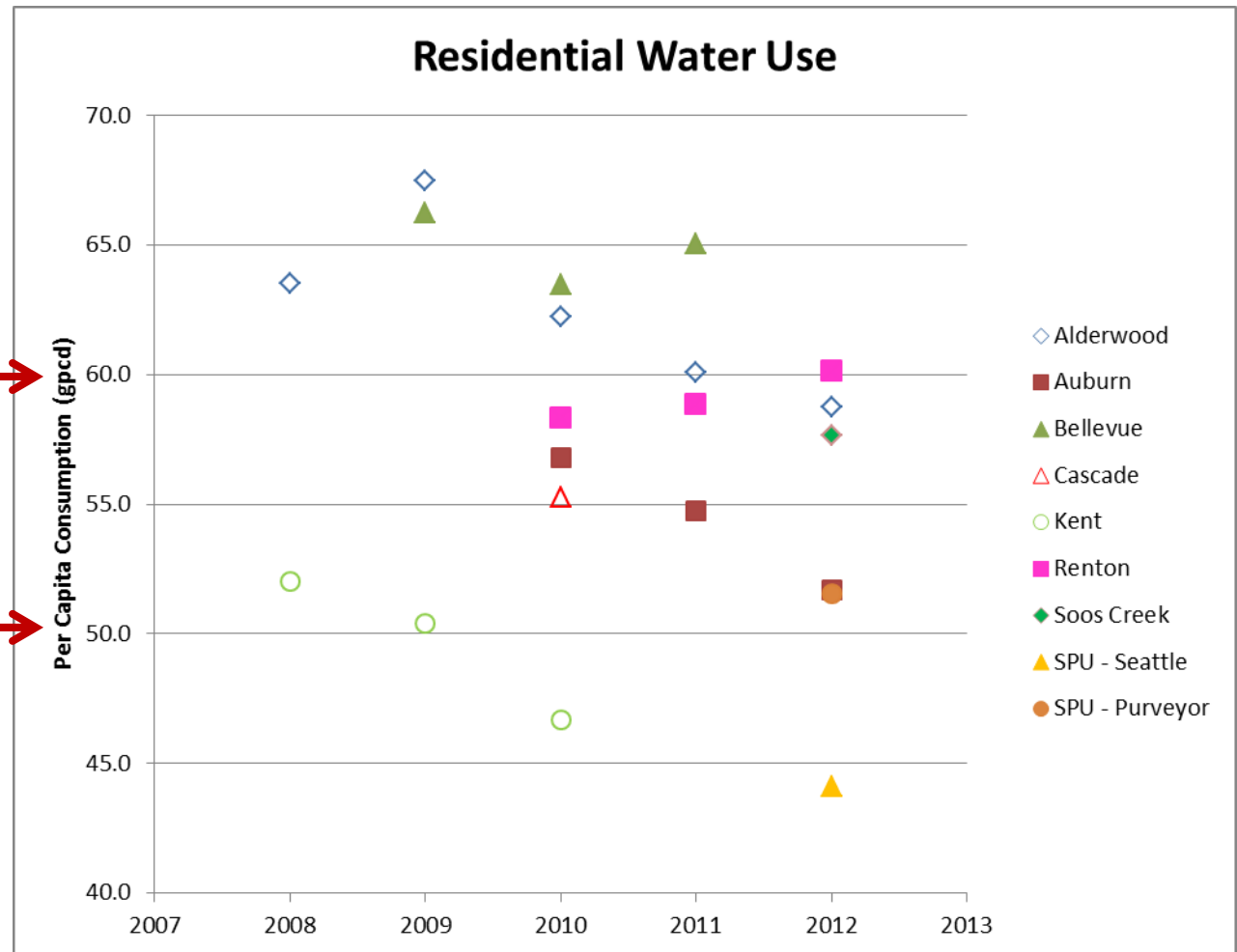


Analysis: Reviewed water and sewer comprehensive plans for existing data and future projections.

Data requirements:

- Usage separated by month or winter/summer
- Usage separated by account type
residential / commercial / industrial
- Conservation projections for winter period

Residential Water Usage



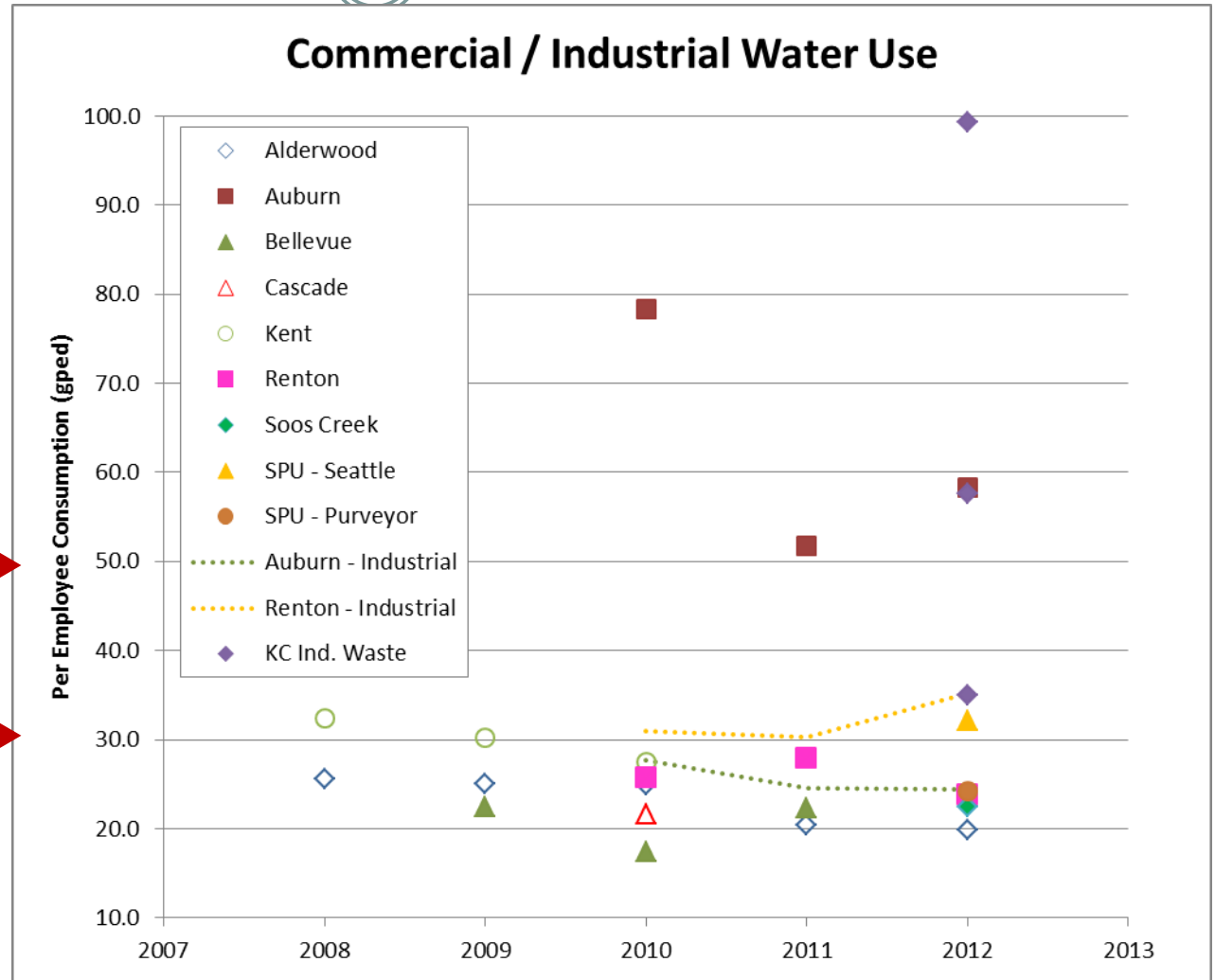
Previous 2010
Residential
(non-Seattle)



Previous 2010
Residential
(Seattle)



Commercial/Industrial Water Usage



Previous 2010
Industrial



Previous 2010
Commercial



Current Water Consumption



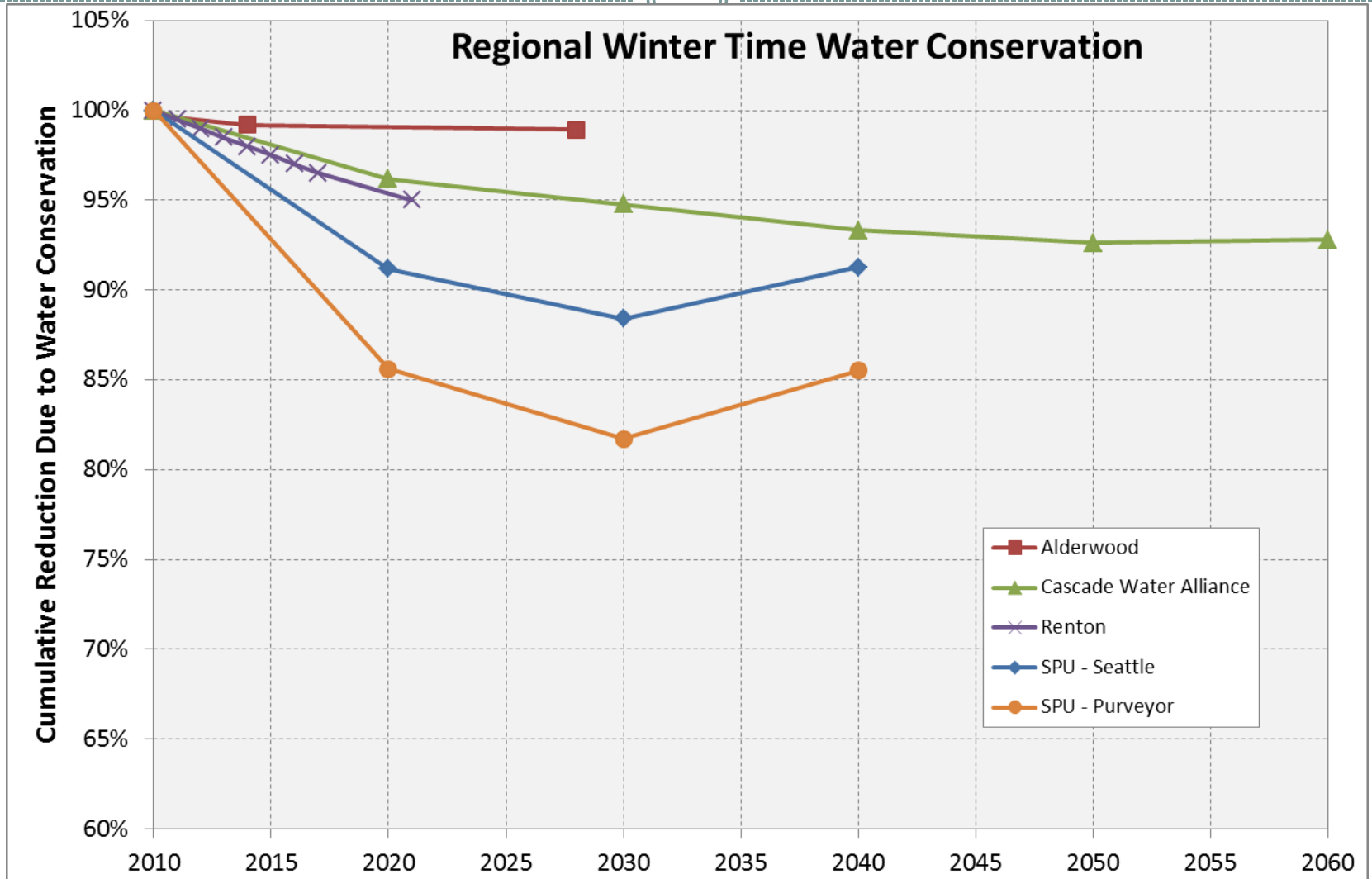
Findings:

- Seattle residential decreased more than predicted.
- SPU + Cascade Water Alliance commercial flow averaged 25 gped
- King County Industrial Waste process flows averaged 22 gped

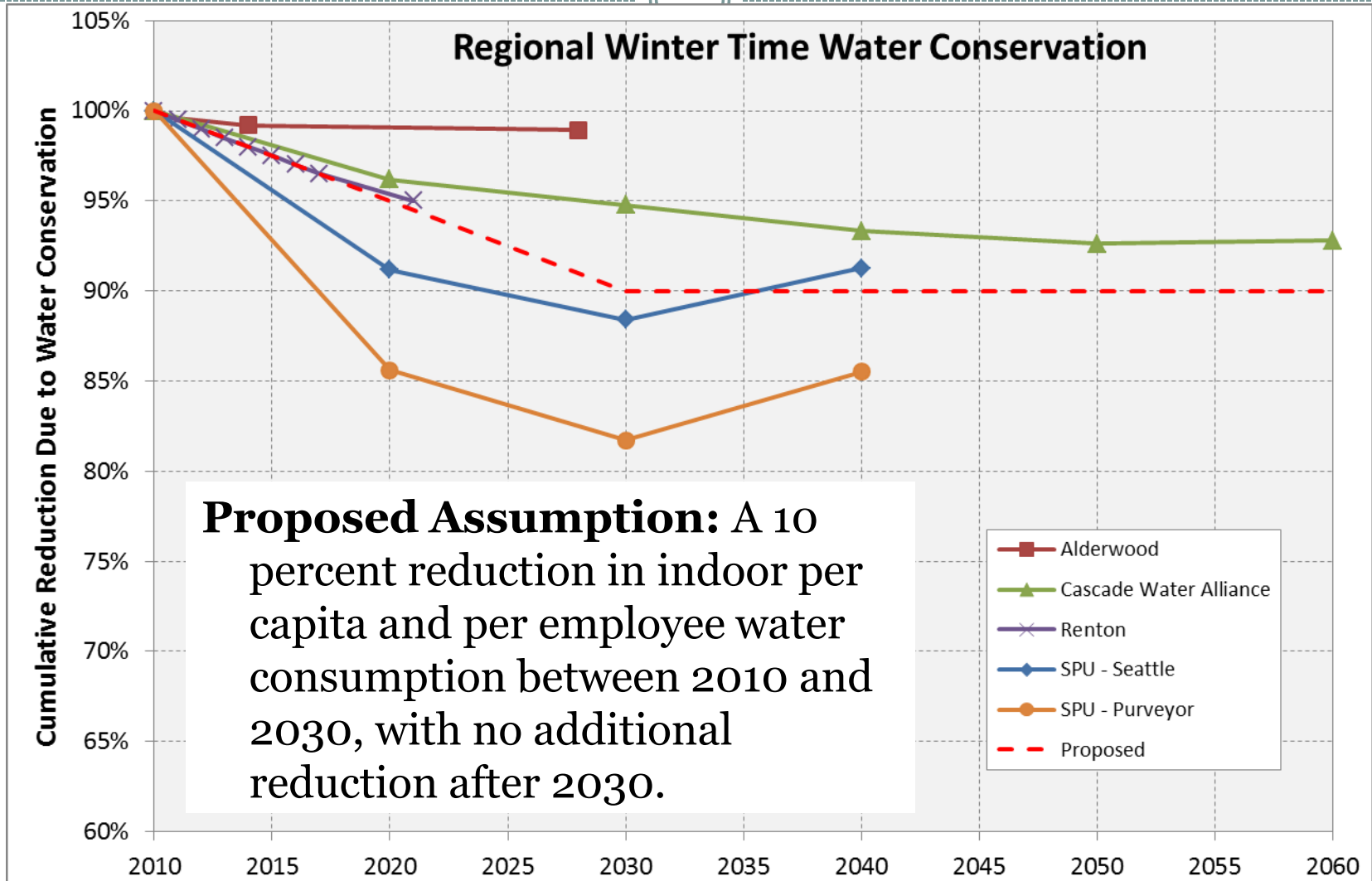
Proposed Assumptions (2010):

	Previous 2000	Previous 2010	Proposed 2010
Seattle residential (gpcd)	55	50	46
other residential (gpcd)	66	60	60
commercial (gped)	33	30	25
industrial (gped)	55	50	47

Assumption: Water Conservation



Assumption: Water Conservation



Future Water Consumption



Future water consumption

= (current water consumption) X (cumulative water conservation factor)

Proposed Water Consumption:

	Previous 2010 -	Proposed 2010	Proposed 2020	Proposed 2030	Proposed 2040
Seattle residential (gpcd)	50	46	43	41	41
other residential (gpcd)	60	60	57	54	54
commercial (gpcd)	30	25	24	23	23
industrial (gpcd)	50	47	45	42	42

Next Meeting/Contacts



- Discussion of sewerage area growth rate, and average wet-weather I/I degradation on 8/1.
- For questions on RWSP Comprehensive Review contact:

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- For questions on CSI Program Update contact:

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