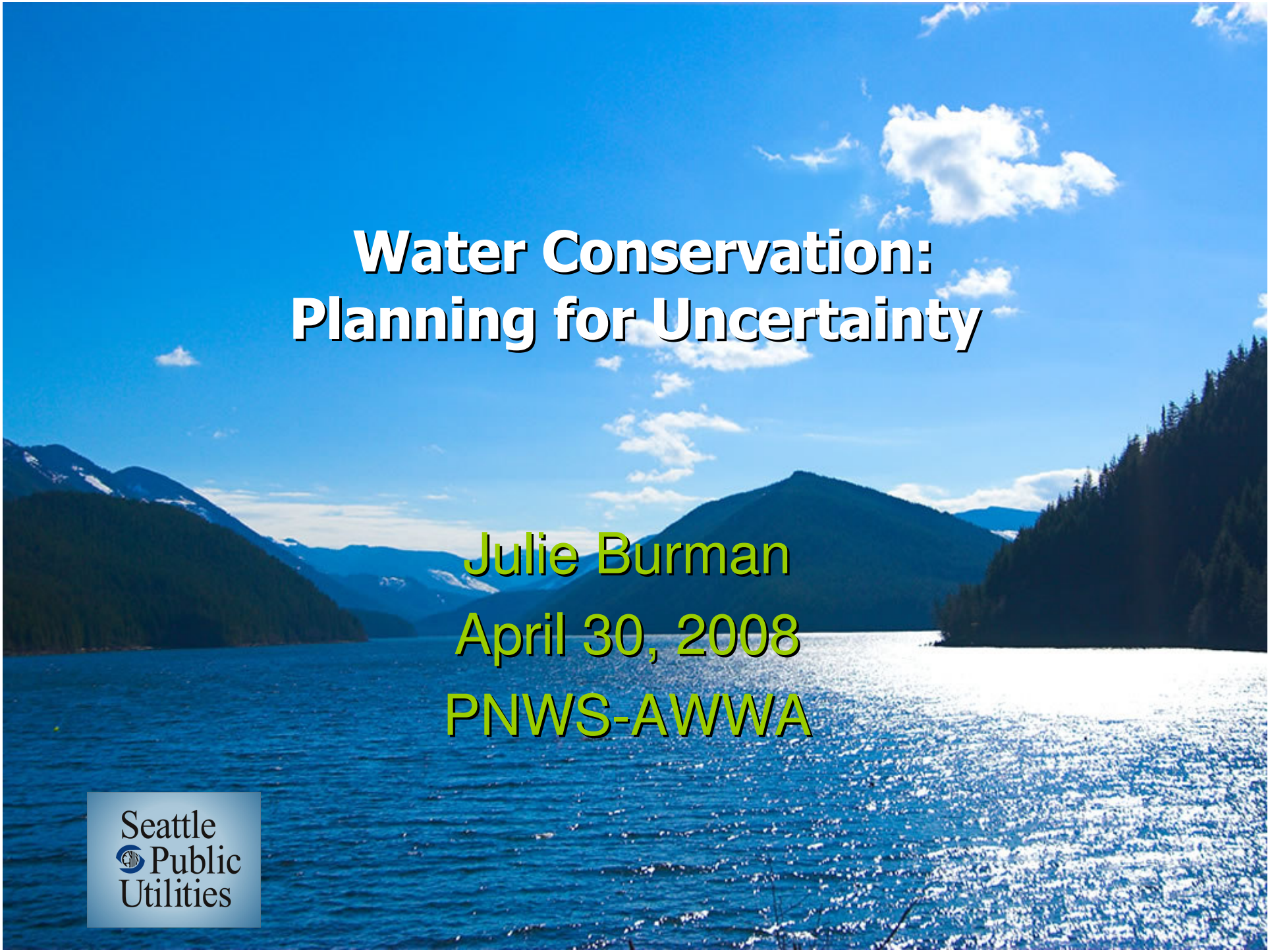


Water Conservation: Planning for Uncertainty

Julie Burman

April 30, 2008

PNWS-AWWA

Seattle Public Utilities

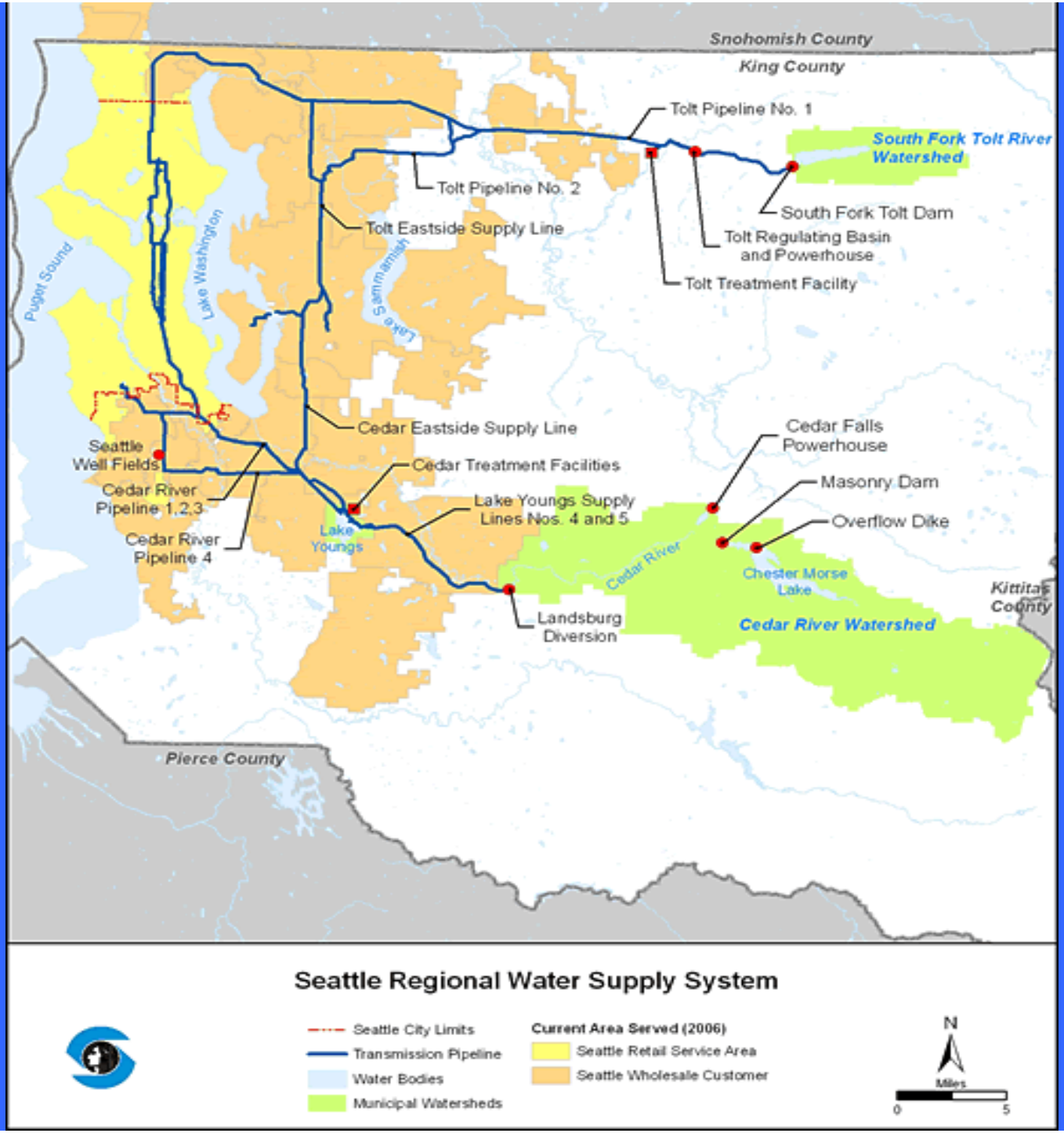
Seattle Public Utilities

Water for People and Fish

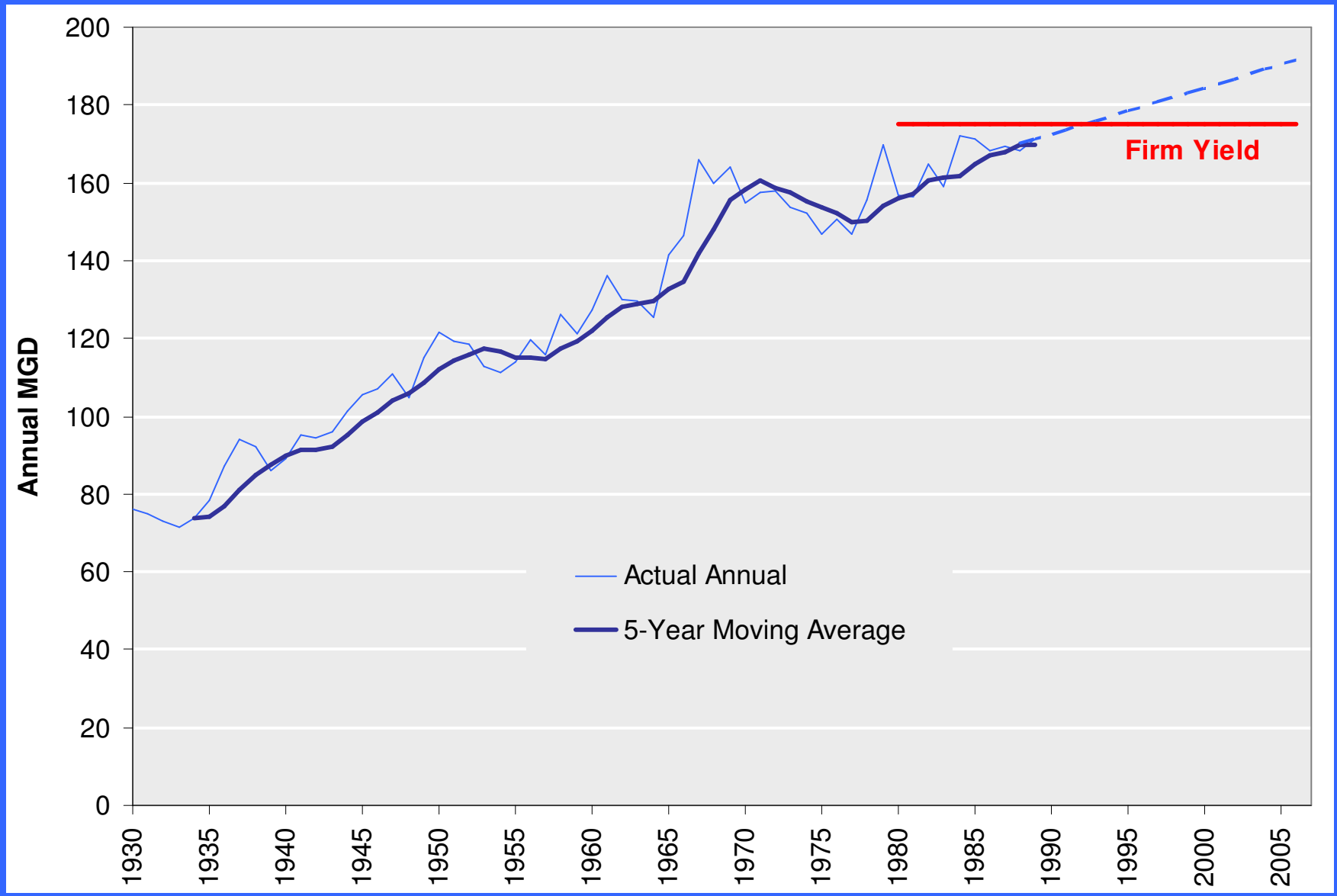
Provide our customers with reliable, cost-effective drinking water services that protect public health and balance our social and environmental responsibilities to the citizens and community.

The Conservation Story

- Seattle's Water System
- Growth & New Supply Options
- 18 Years of Conservation
- Accomplishments
- Planning for Uncertainty & Future Conservation


Snohomish County
King County
Tolt Pipeline No. 1
South Fork Tolt River Watershed
Tolt Pipeline No. 2
South Fork Tolt Dam
Tolt Eastside Supply Line
Tolt Regulating Basin and Powerhouse
Tolt Treatment Facility
Puget Sound
Lake Washington
Lake Sammamish
Cedar Eastside Supply Line
Cedar Falls Powerhouse
Seattle Well Fields
Cedar Treatment Facilities
Masonry Dam
Cedar River Pipeline 1,2,3
Lake Youngs Supply Lines Nos. 4 and 5
Overflow Dike
Lake Youngs
Cedar River
Cedar River Pipeline 4
Chester Morse Lake
Kittitas County
Landsburg Diversion
Cedar River Watershed
Pierce County
Seattle Regional Water Supply System
Seattle City Limits
Transmission Pipeline
Water Bodies
Municipal Watersheds
Current Area Served (2006)
Seattle Retail Service Area
Seattle Wholesale Customer
N
Miles
0
5

Annual Seattle Water Demand 1930-1990



Conservation as an Alternative: Considerations in the 1990s

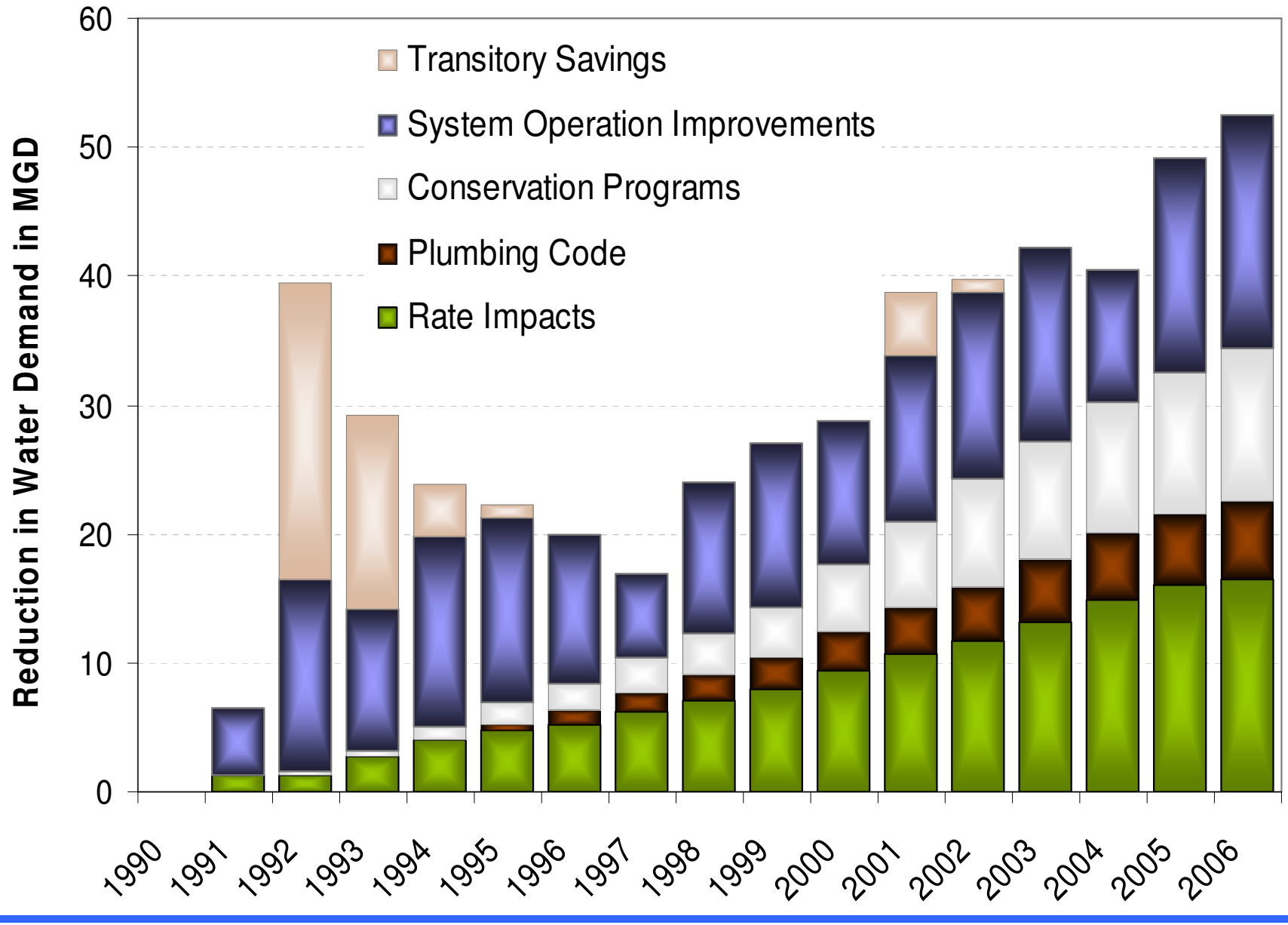
- 1987 Drought
- Developing new supply involved:
  - High Capital Costs
  - Negative Environmental Impacts
  - Regulatory Uncertainty
  - Long Lead Time
- Energy experience of the early 1980s

Question: Is it possible to delay the need for new supply through conservation?

Four Sources of Conservation

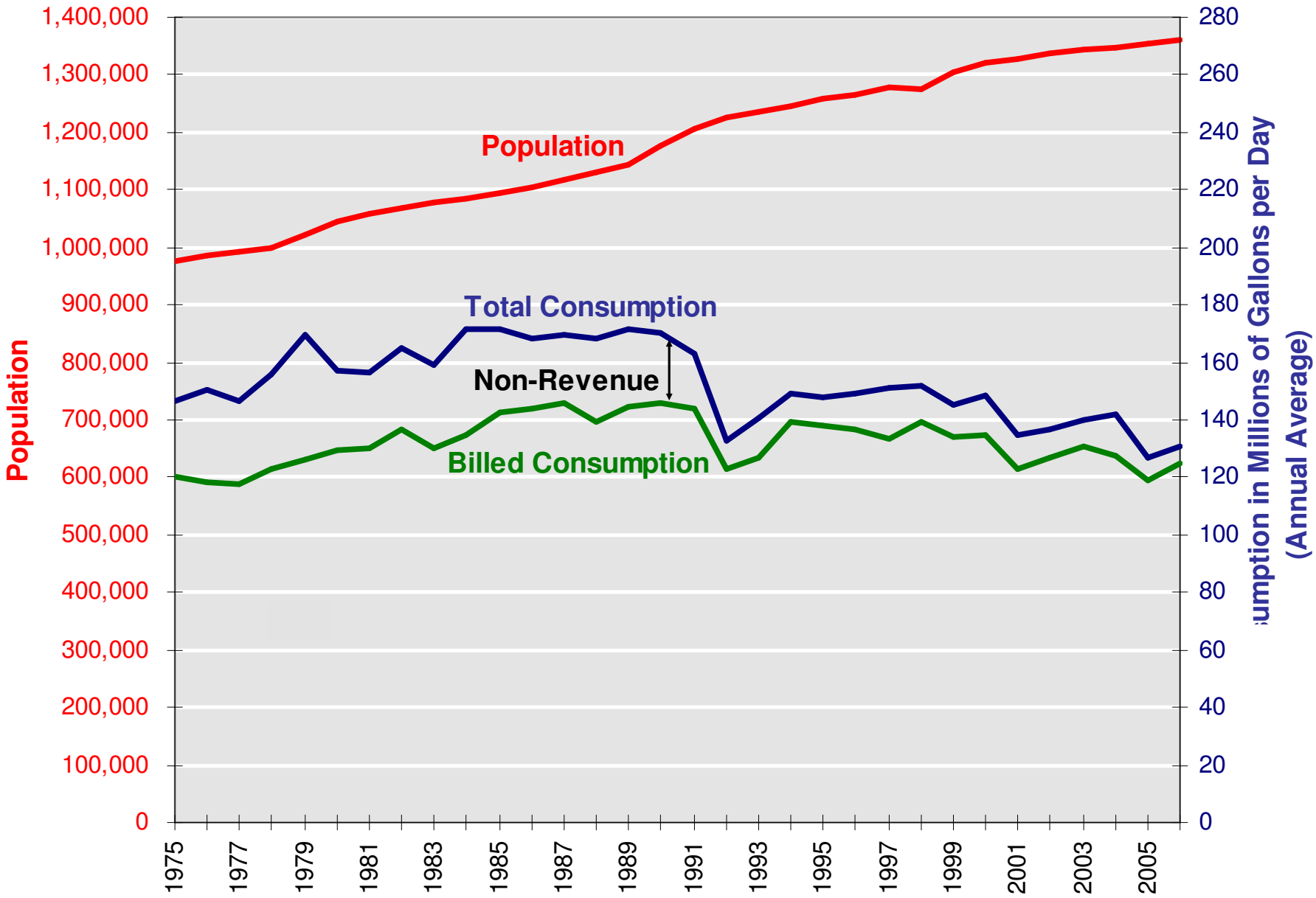
- Federal and State Plumbing Code
- Conservation Programs
- New rate structure to provide price signals
- Reductions in “Non-Revenue” Water

Cumulative Water Savings Since 1990



Growth in Population and Water Consumption

Seattle Regional Water System: 1975-2006



Hardware Measures

Program pays 50% or more – clothes washers, pre-rinse spray heads, process controllers, and irrigation systems

Water savings are relatively easy to attribute to SPU investment

Hardware – funded by CIP

Behavior Measures

Disseminate information to customers to change practices
Challenge to attribute savings to SPU investment
Messaging – Funded by O&M

Regional 1% Program

Progress 2000-2007

2007 Cumulative mgd savings = 7.5 mgd

Annual Targets 2007-2010

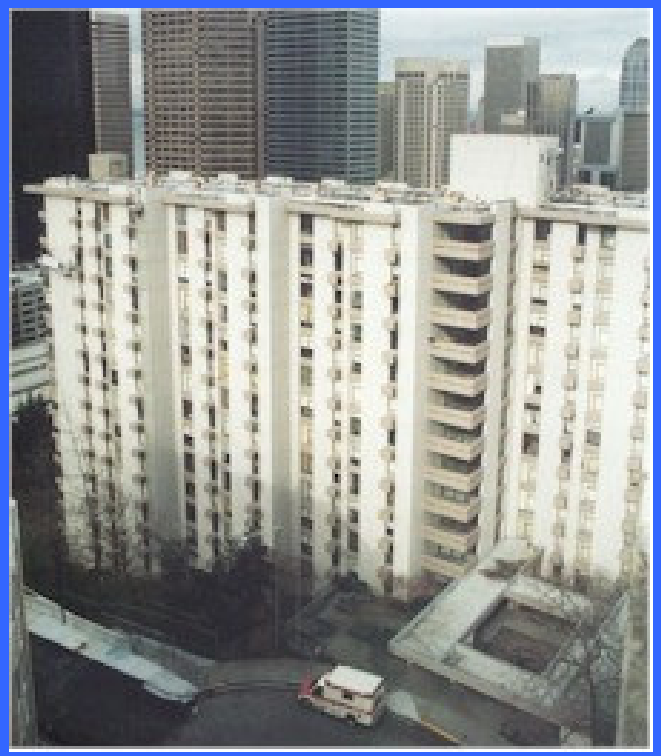
1.12 mgd each year

Regulatory Requirement

6-year conservation goal key part of
2007 Water System Plan

Everyone Can Conserve = Seattle only

- Reach substantially all with offer to retrofit with water saving measures. Voluntary program
- Retrofit 21,650 units – 42% market penetration by 2010
- 2008-2010 goals – 1650 units per year + clothes washers for limited number of units



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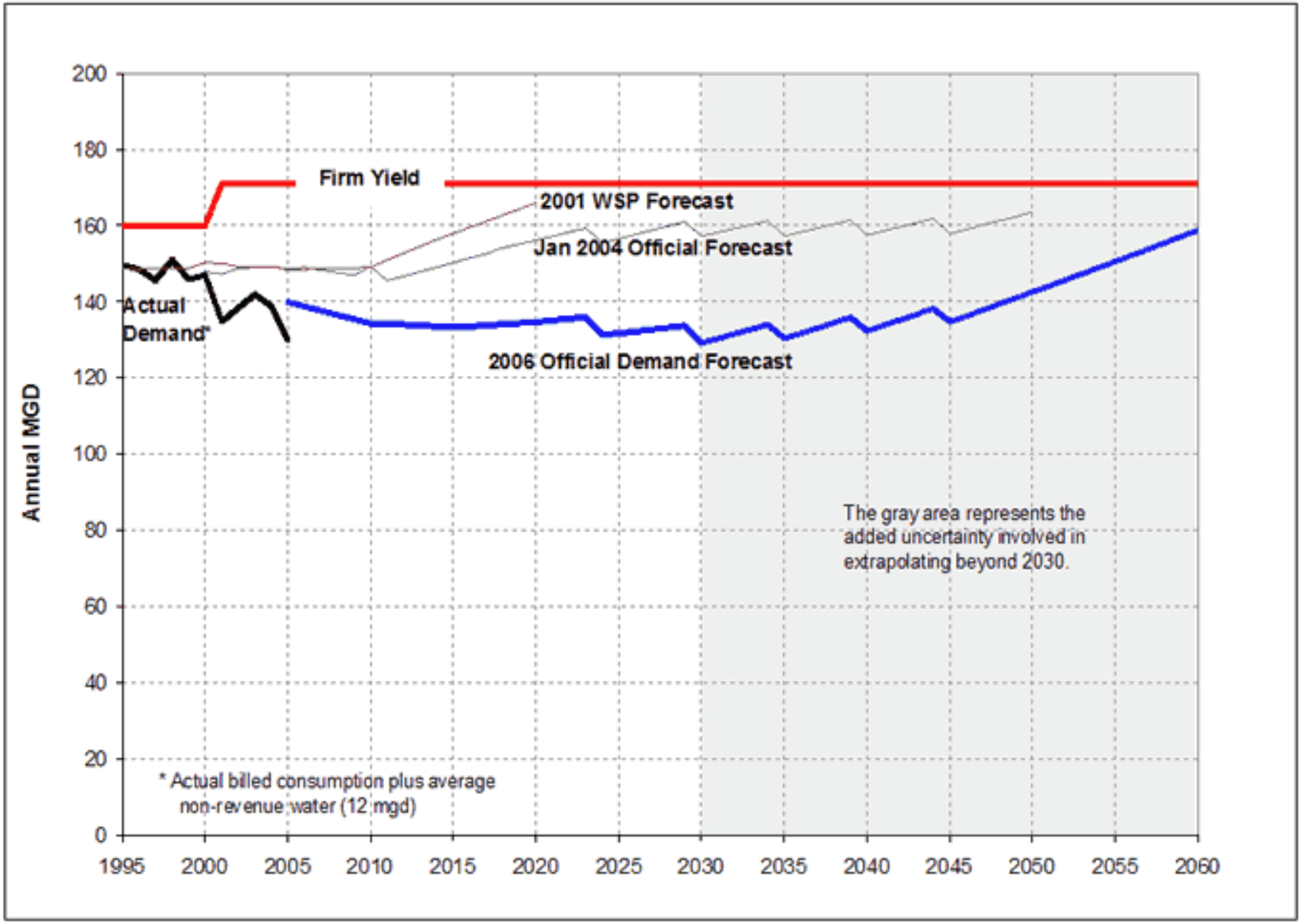
Planning for Uncertainty

Forecasts of Future Water Use

SPU's 2006 Official Water Demand Forecast



*Note: The increase in firm yield in 2000 is due to the start-up of the Tolt Treatment Facility.

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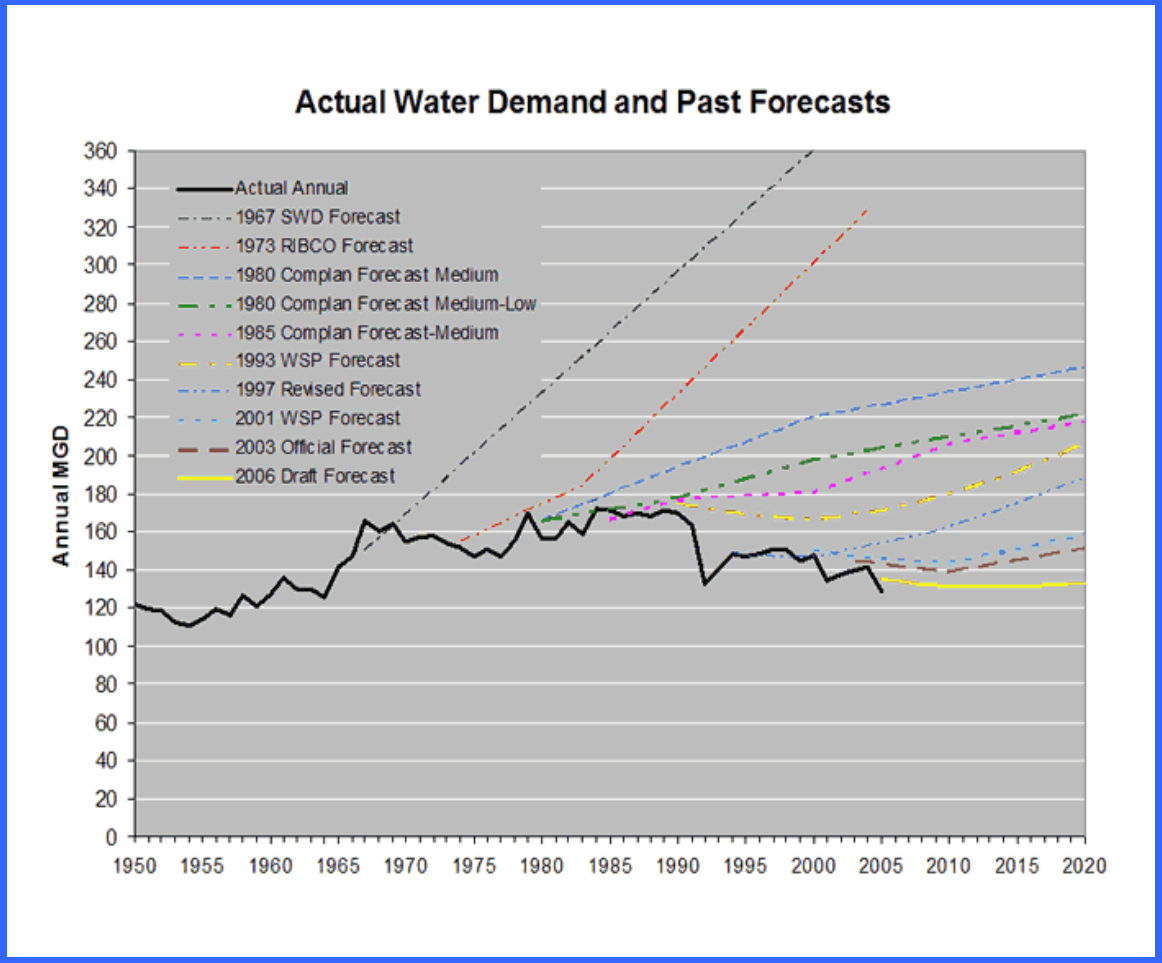
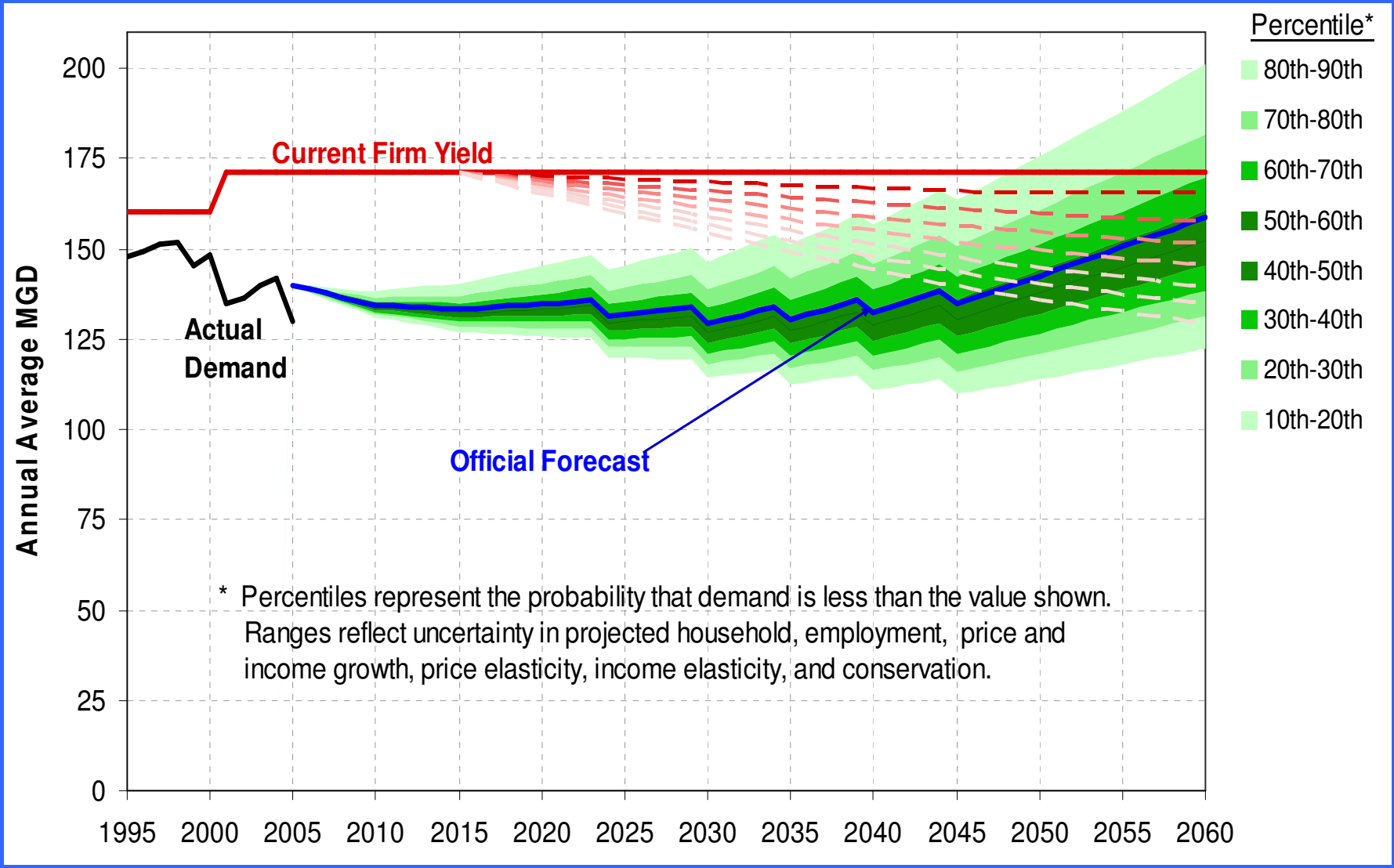
Planning for Uncertainty

Water Supply and Demand



Uncertainty Around Supply



Conservation Goal Setting: Considerations in the 2000s

- What are the reasons to conserve water if not needed as a new source of supply?
- Given those reasons, how much should be conserved and at what cost?

"Why conserve water if we have enough for 50 years?"

Background

Asset Management

- Cost effectiveness
- Total life-cycle costs and benefits
- Triple bottom line – financial, social and environmental costs and benefits
- Manage risks

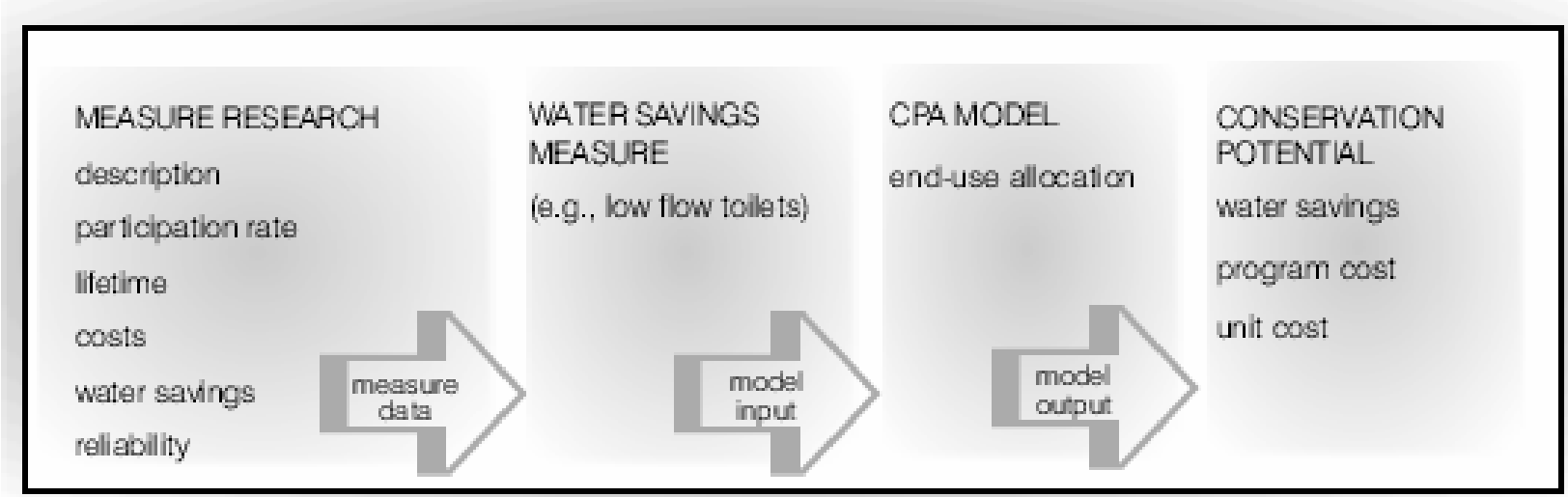
Conservation Analysis

Components

- Identify & analyze conservation drivers
  - Risk Framework
- Identify & analyze alternative levels of conservation
  - Conservation Potential Assessment (CPA)

Decision Model

SPU's Conservation Potential Assessment
Calculates water savings and costs for 140 water saving measures
Calculates savings from Indirect Benefits – energy, stormwater and wastewater
Does not calculate social costs



Results of Drivers Analysis

Alternative Conservation Baseline Strategies	Description and Performance Measure	Public Trust Risk	Regulatory Risk	Asset and Service Reliability Risk	Legal Risk	Environmental Risk	Workforce Risk
Do Nothing	No messaging or incentives. No performance measure.						
Awareness Campaign	Messaging; no incentives. Less intense than 1% program. Customer survey to assess effectiveness. Results estimated <.3 MGD annual savings.						
Program to Shave Peak Investment Variable	Less intense than 1% program. Set performance goal for peak season. Results could range from <.3-.5 MGD peak season savings.						
Low Intensity Program / Investment	Less intense than 1% program. Set performance goal on per capita demand. Results could be in range of .7 MGD annual savings.						
Medium Intensity Program / Investment	Similar intensity to 1% program. Set performance goal to keep demand flat. Results could range from 1-1.5 MGD annual savings.						
High Intensity Program / Investment	Intensity estimated to be greater than 1% program. Set performance goal to reduce total demand. Results could be above 1.5 MGD annual savings.						

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2030 Regional Conservation Goal

- **Save 7 million gallons a day from 2006 through 2010 = 1% Regional Program + Seattle Ordinance requirements**
- **Save an additional 15 million gallons per day from 2011 through 2030 = regional baseline conservation**
- **Build these savings into the new demand forecast**
- **If more water supply is needed in the future, additional (more costly) conservation will be considered.**

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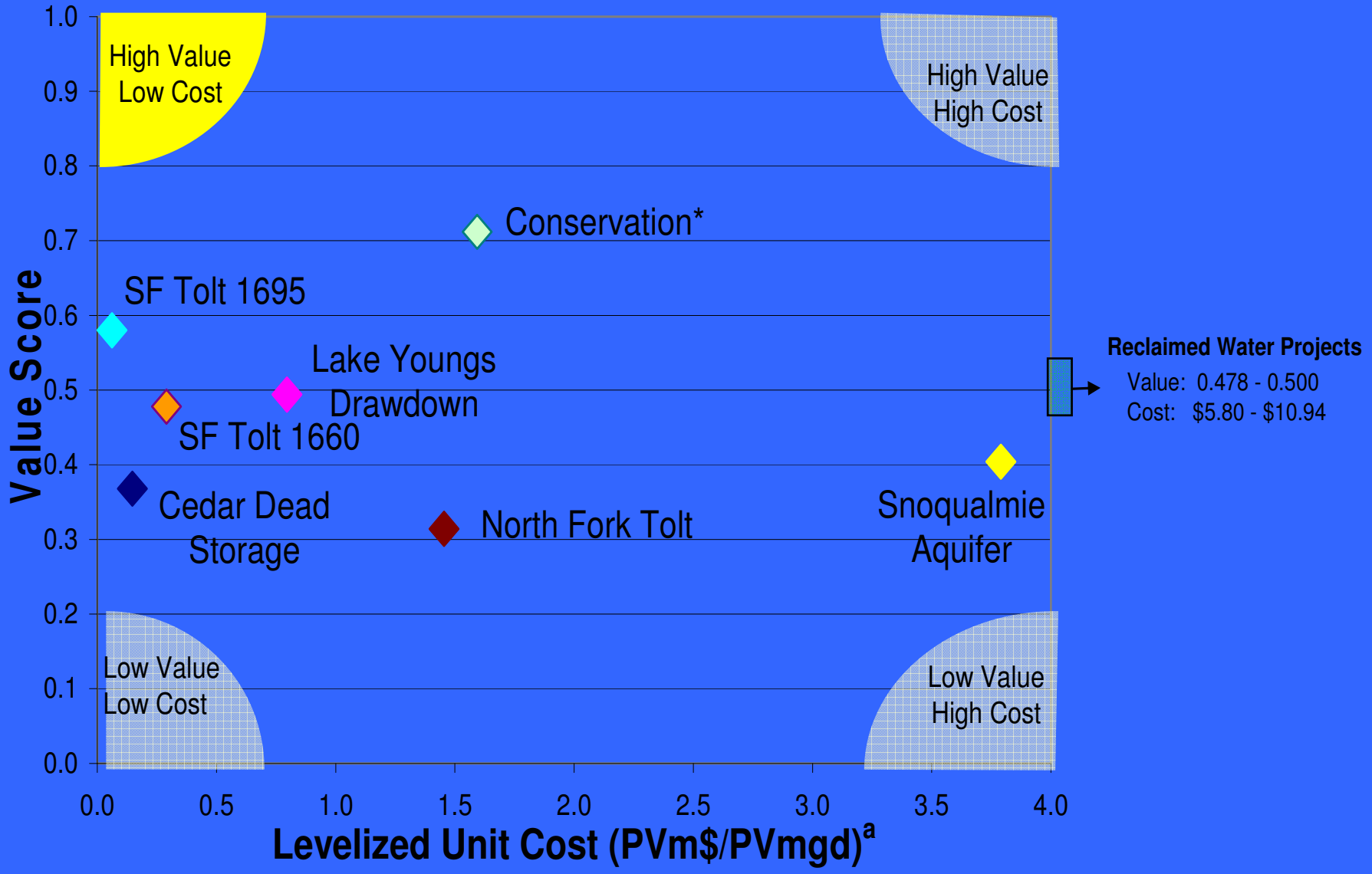
Conservation Goal

- Today – given the need for no new supply – conservation is viewed as:
  - Low-cost insurance for climate change
  - Low-cost way to manage the resource
  - Low-cost way for customers to manage their bills

Compare Value Score and Cost



[a]Calculated assuming all sources online in 2050.

*4 mgd conservation program begins in 2045 and phases in over a 10-year period.

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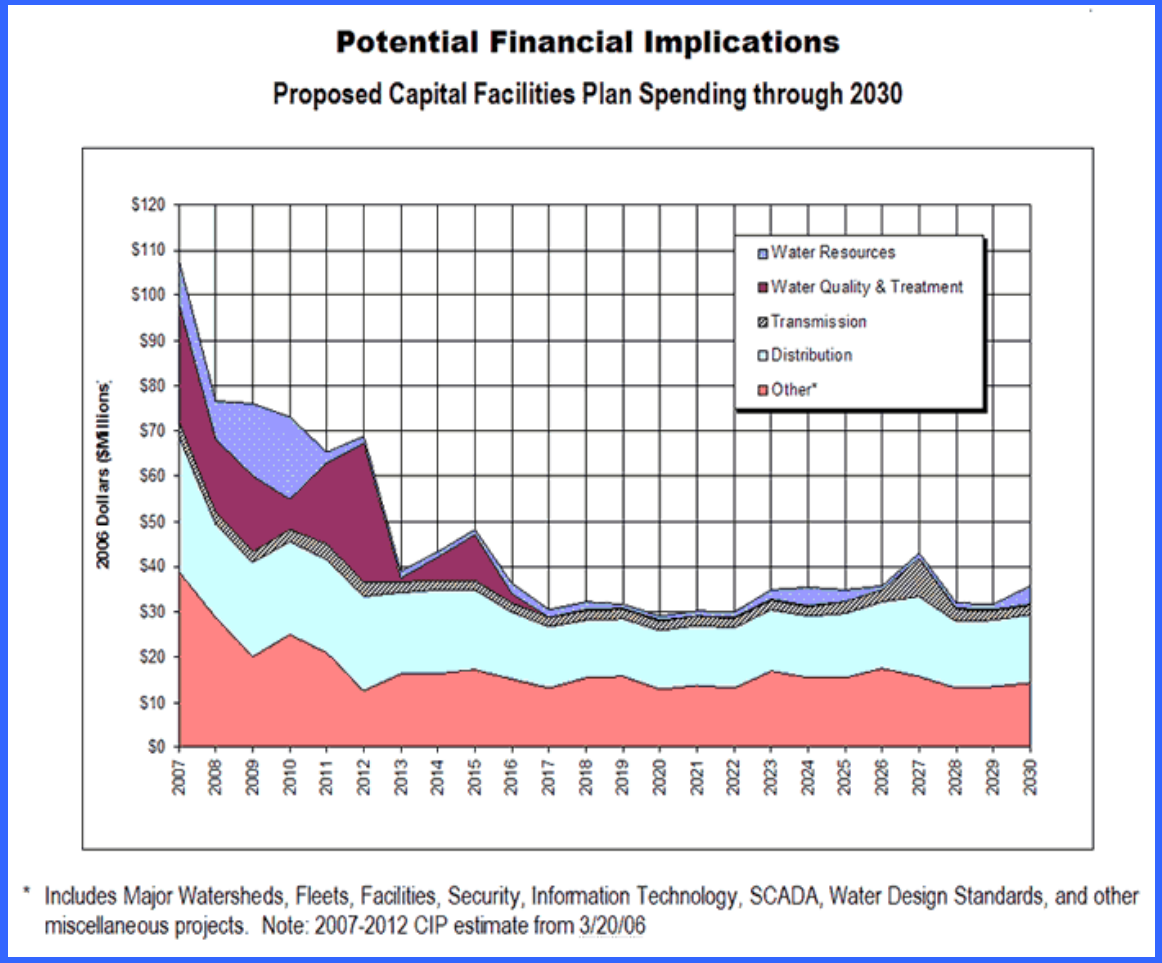
Potential Financial Implications



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