

Forecasting Water Demands and Conservation Savings Considering Land Use and Local Governments

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San Francisco Public Utilities Commission

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Presentation Overview

- **SFPUC Regional Water System and Service Area**
- **Demand Forecast and Conservation Potential Study Purpose and Methodology**
- **Establishing Baseline Water Demand Projections**
- **Evaluating Conservation Potential**
- **Results, Conclusions and Potential Role of Local Governments**



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Overview of SFPUC

Provides water, sewer and municipal power to
City and County of San Francisco

Provides water to 28 wholesale customers in
Alameda, San Mateo and Santa Clara
Counties

Provides water to 2.4 million people



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Overview of BAWSCA

Bay Area Water Supply and Conservation Agency (BAWSCA) represents the interests of SFPUC's 28 wholesale customers:

- 26 cities
- 10 water districts
- 2 private utilities

Collectively serve 1.7 million people, businesses and community organizations

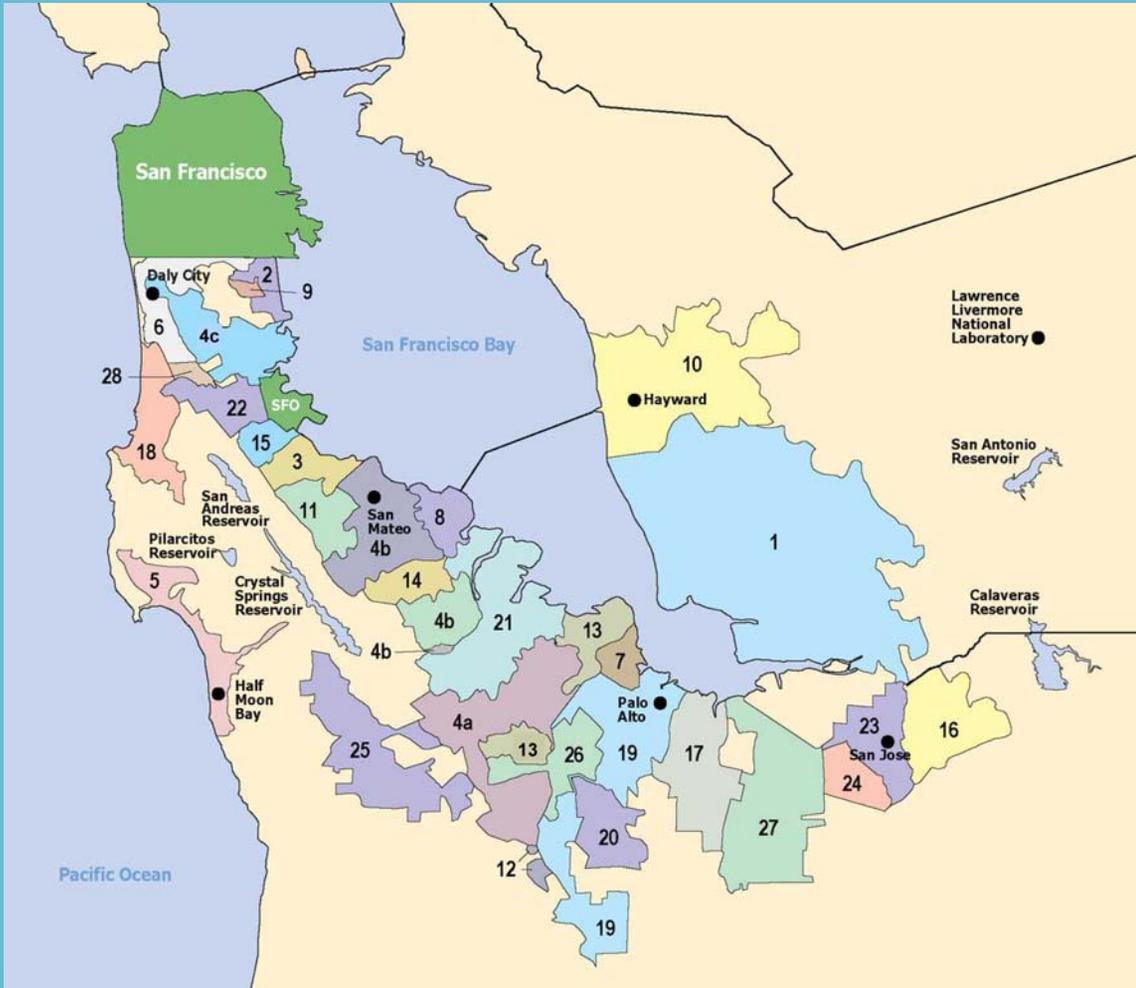


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SFPUC Customer Service Area and BAWSCA Membership



#	SFPUC Wholesale Customer
1	Alameda County Water District
2	Brisbane, City of
3	Burlingame, City of
4a	CWS – Bear Gulch District
4b	CWS – Mid Peninsula District
4c	CWS – South San Francisco District
5	Coastside County Water District
6	Daly City, City of
7	East Palo Alto, City of
8	Estero MID/Foster City
9	Guadalupe Valley MID
10	Hayward, City of
11	Hillsborough, Town of
12	Los Trancos County Water District
13	Menlo Park, City of
14	Mid-Peninsula Water District
15	Millbrae, City of
16	Milpitas, City of
17	Mountain View, City of
18	North Coast County Water District
19	Palo Alto, City of
20	Purissima Hills Water District
21	Redwood City, City of
22	San Bruno, City of
23	San Jose, City of (portion of north San Jose)
24	Santa Clara, City of
25	Skyline County Water District
26	Stanford University
27	Sunnyvale, City of
28	Westborough Water District
CWS	California Water Service (Company)
MID	Municipal Improvement District

Map courtesy of BAWSCA website

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SFPUC Regional Water System and Service Area

Current SFPUC system delivers approximately 270 mgd

- 32% delivered to Retail Customers
- 68% delivered to 28 Wholesale Customers

Wholesale Customer Service Area

- 2004 Total water demands = 266 mgd
- Multiple sources of supply
 - 182 mgd from SFPUC
 - Recycled water, groundwater, local surface water, State and Federal Water Projects

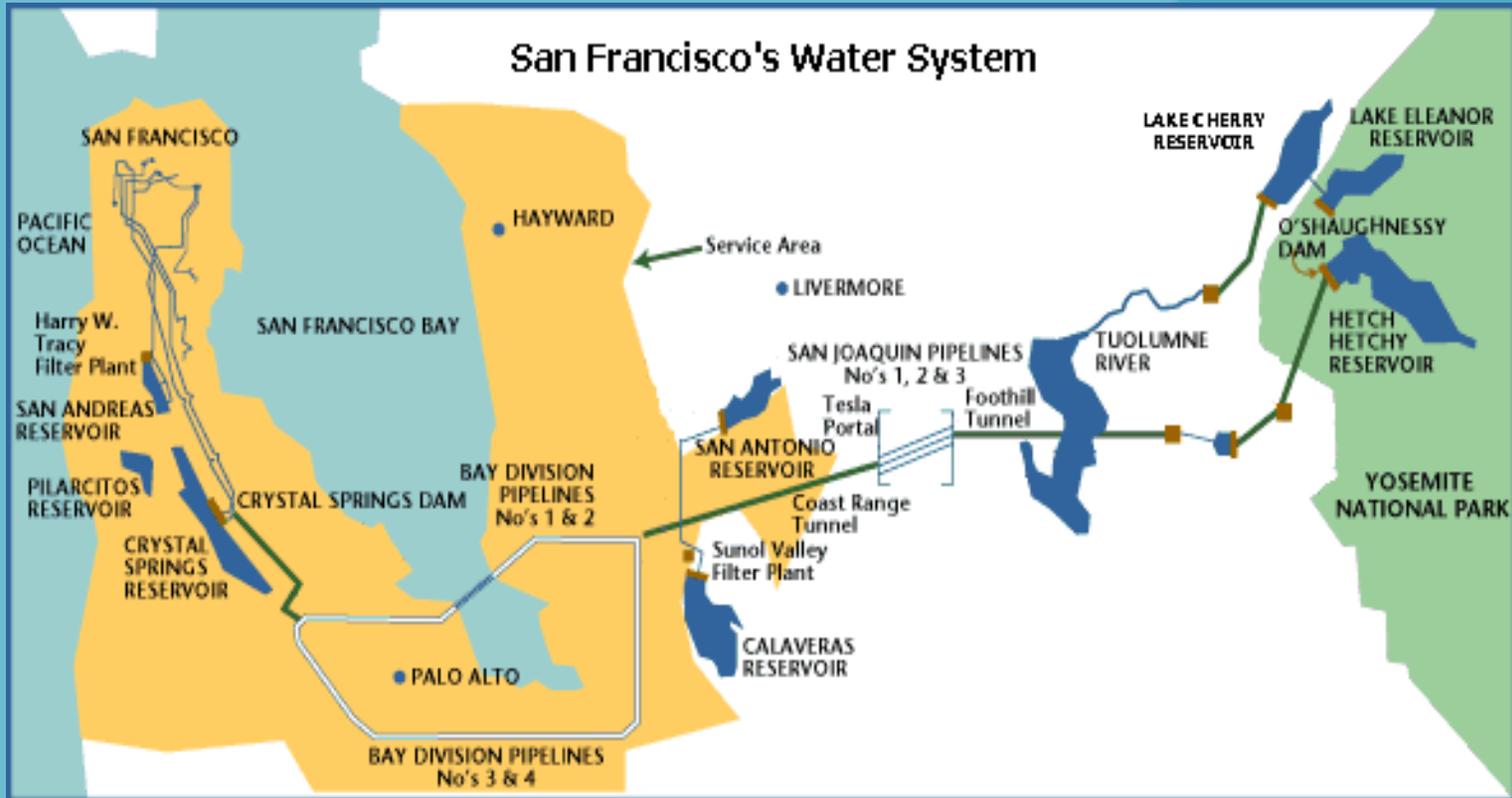


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SFPUC Regional Water System



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Study Purpose

Water Supply Improvement Program (WSIP)

- Underway to improve SFPUC Regional Water System reliability and reduce risk of failure

Assess Future Regional Water Demand

- Each wholesale customer makes its own water management planning decisions
- SFPUC relies on wholesale customers for determining their needs from the SFPUC regional system
- Planning estimates enable SFPUC to appropriately design WSIP Projects
- Planning estimates inform growth-inducing impacts section of the Program EIR



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Study Methodology

Applied End-Use Model for Demand Forecasts and Conservation Potential

- End-use model can provide a transparent connection between water use and land use
- End-use model incorporates the effect of plumbing codes on current and future demand
- Allows for a cost-effectiveness analysis conservation measures and their potential impact on future demand



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Establishing Water Demand Projections

■ Analyze Water Consumption Data

- Establish base-year water demand by user account type

■ Develop Account-Type Growth Rates

- Using service area population and employment growth
- Incorporating land use changes consistent with General Plans and/or Specific Area Plans



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Establishing Water Demand Projections

- **Determine Impact of Plumbing and Appliance Codes**
- **Develop Service Area Specific End-Use Models**
 - More accurately assess plumbing code impacts
 - Set up framework for evaluating water conservation measures
- **Forecast Future Water Demand**

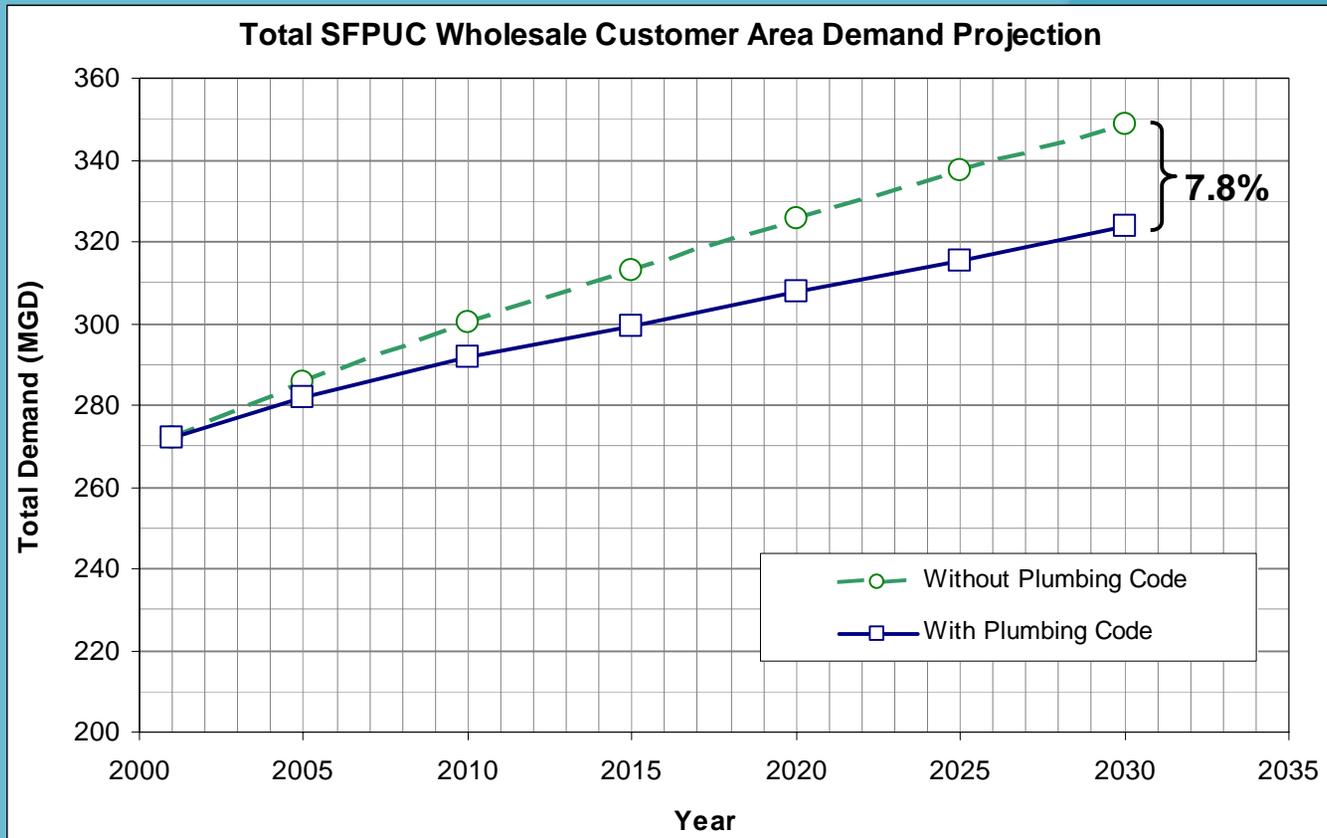


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Projected Water Demands SFPUC Wholesale Customer Service Area with No Additional Conservation



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Evaluating Conservation Potential

- Summarize Current Conservation Efforts
- Identify and Screen Potential Conservation Measures
- Evaluate Cost-Effectiveness and Water Savings Potential for Each Measure
- Select Best Measures for Each Service Area and Form 3 Conservation Programs
- Summarize Program Range of Total Wholesale Customer Service Area Conservation Potential for Planning Horizon



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Current Wholesale Conservation Efforts

- All wholesale customers implement conservation measures to some degree
- 13 of the 28 wholesale customers, representing 70% of water use in wholesale service area, are signatories to Best Management Practices MOU for Conservation.
- Other measures being implemented include:
 - Rebates for dual-flush
 - ET controller rebates
 - RMF washing machine rebates
 - Incentives for water efficient landscaping and irrigation



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Measures Selected for Evaluation

- Started with a list of 75 measures
 - Rebates and incentive programs
 - Ordinances
 - Educational outreach and award programs
- Screened list to 32 Measures
 - Qualitative Screening Criteria
 - Technology/Market Maturity
 - Service Area Match
 - Customer Acceptance/Equity
 - Relative Effectiveness of Measures Available



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Measures Selected for Evaluation

- Types of measures that were eliminated
 - Ordinances
- Types of measures that survived screening
 - Rebates
 - Surveys
 - Education/Outreach



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Measure Selection Process

- Cost-effectiveness of each measure
 - Future cost of water \$1100/AF in 2015
- Potential water savings
- Service area characteristics
- Behavioral patterns
- Budgetary consideration
- Ease of Implementation

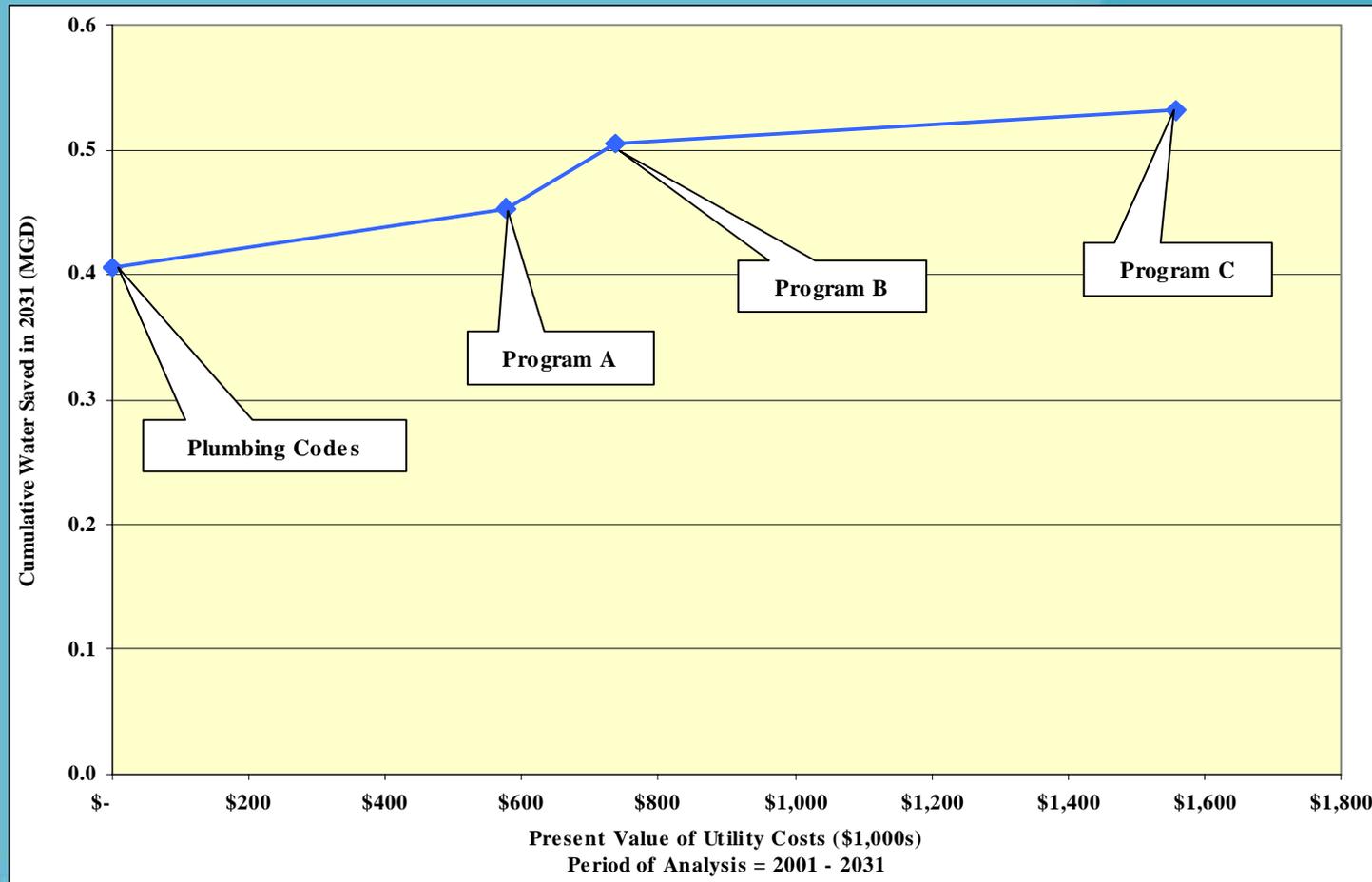


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Illustration of Conservation Program Cost-Effectiveness



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SFPUC Wholesale Customer Service Area Water Conservation Potential

SFPUC Customer Conservation Program	Water Utility Benefit-Cost Ratio (30-Year Period)	Present Value of Water Utility Costs (\$1,000) (30-Year Period)	2030 Water Savings due to Conservation Programs (mgd)	2030 Outdoor Only Water Savings due to Conservation Programs (mgd)	Cost of Water Saved (\$/AF) (30-Year Period)	Total Potential 2030 Water Savings (mgd)
(Plumbing Code)	NA	NA	-	NA	NA	25.4
Program A	1.95	\$62,601	7.7	3.5	\$280	33.1
Program B	2.35	\$93,385	14.5	7.8	\$235	40.0
Program C	2.50	\$117,866	19.6	10.6	\$226	45.0



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SFPUC Wholesale Customer Service Area Conservation Savings as Percentage of 2030 New Demand

2001 DSS Base Year Total Water Demand (MGD)	2030 DSS Projected Total Water Demand (MGD)	2030 Demand Increase (Total New Demand) from 2001 (MGD)	2030 Water Savings due to Conservation Programs (MGD)			Water Savings as a Percentage of 2030 Total New Demand		
			A	B	C	A	B	C
272	324	52	7.7	14.5	19.6	15%	28%	38%



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SFPUC Wholesale Customer Service Area 2030 Conservation Commitment

- Agencies Have Committed To Increased Conservation Savings In 2030
 - 25 mgd savings from Plumbing Code
 - 14 mgd from additional conservation programs
- 2030 demand reduced by 11% through increased conservation



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Conclusions Related to Local Government

- Using an end-use model allows for a transparent link between land use and water use
- There is a body of conservation measures that benefit from political will for implementation
- Elected officials can be the driver for these conservation measures



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