

# This presentation premiered at WaterSmart Innovations

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**Presentation by  
West Basin Municipal Water District and  
A & N Technical Services, Inc.**



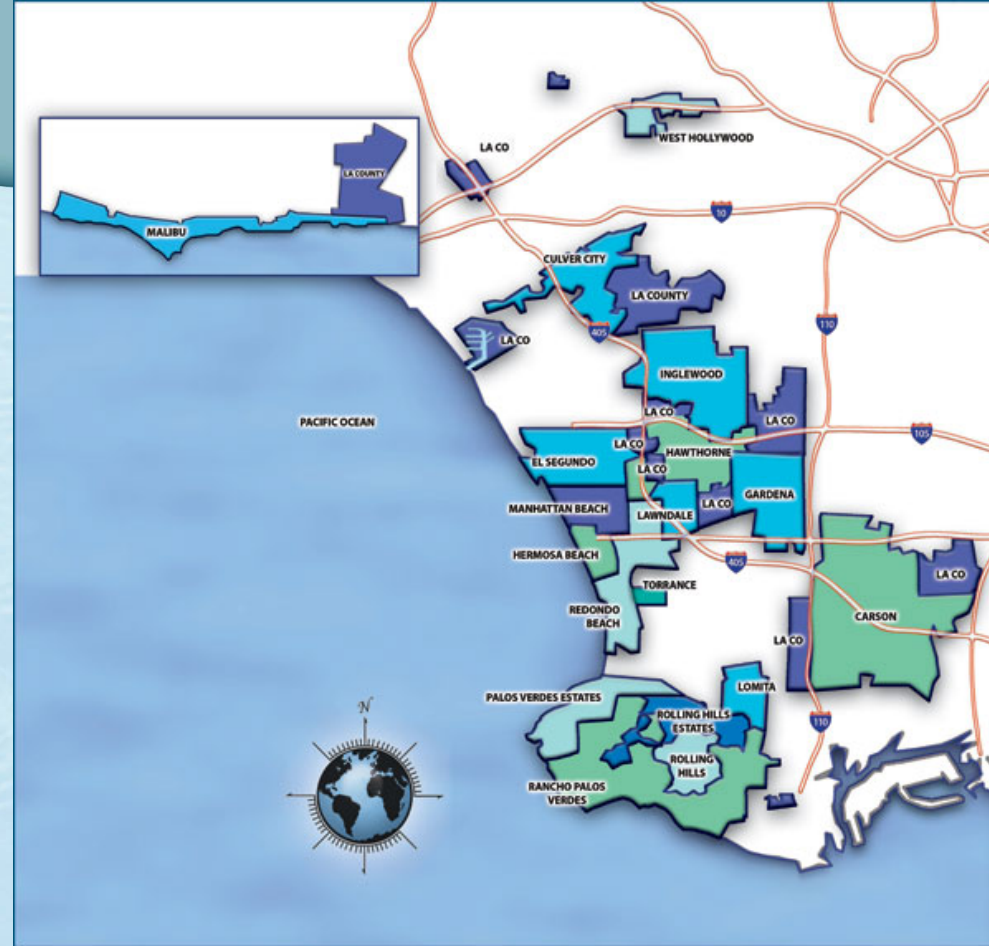
# **How to Develop a Conservation Master Plan in 6 Steps**

**October 10, 2008**

**Presenters:  
Gus Meza, West Basin  
Dr. Tom Chesnutt, A&N  
Maureen Erbeznik**

# Who is West Basin MWD?

- Water Wholesaler in Los Angeles County
- Provides Imported Water to 1 Million People
- Provides Recycled Water
- Provides Education & Conservation Programs



# West Basin's Commitments to Customers



- **Water Reliability** – West Basin is committed to innovative planning and investments to provide water supply reliability and drought protection.
- **Water Quality** – West Basin is committed to providing safe, high quality water by meeting current and anticipated water quality requirements.
- **Sound Financial and Resource Management** – West Basin is committed to efficient business operations, financial planning and asset management.
- **Customer Service** – West Basin is committed to providing value by understanding and meeting the needs of our customers and the communities we serve.
- **Environmental Stewardship**– West Basin is committed to sustainable and environmentally-friendly business practices.

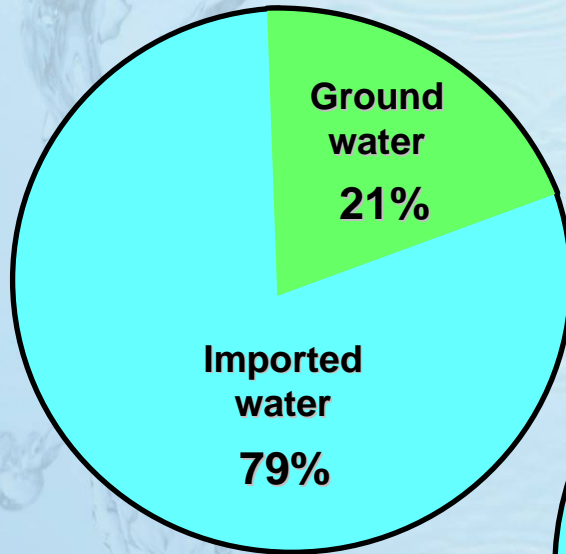
# Why a Master Plan?



- Accountability for IRP Conservation Target
- District takes conservation as a serious resource option
- Cost-effectiveness supporting program decisions
- Technical survey of water end users

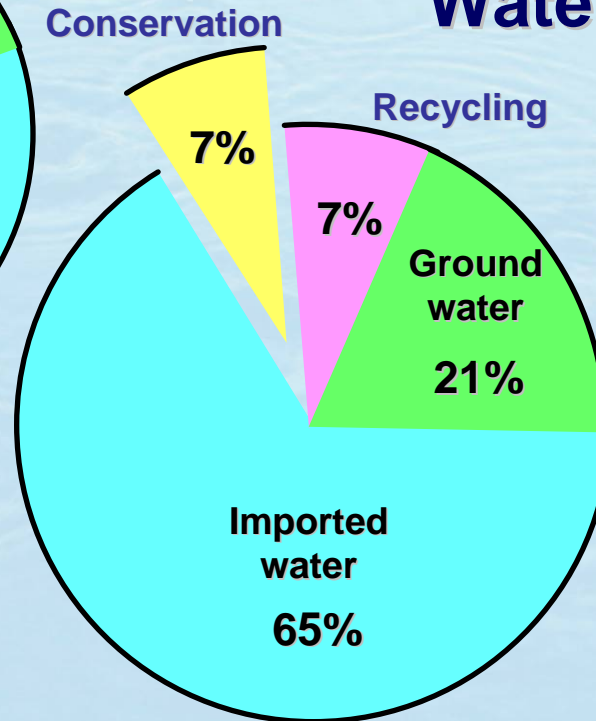
# Why a Master Plan?

## West Basin MWD's Water Supply Portfolio



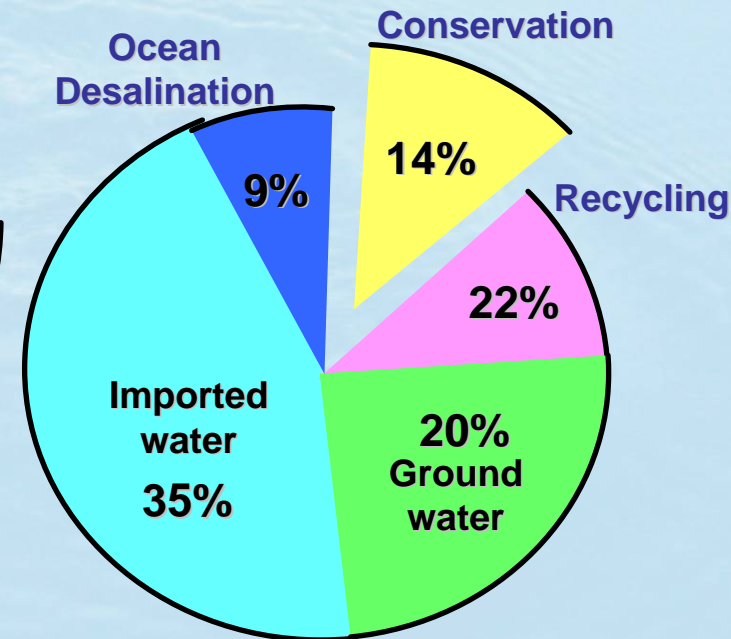
**1990**

Heavy Dependence on  
Imported Supply



**2005**

Today's  
Water Supply mix



**2020**

District's Vision

# Master Plan Objectives



- Policy document to guide investments in conservation
- Flexible five-year action plan
- Detailed database to develop future programs

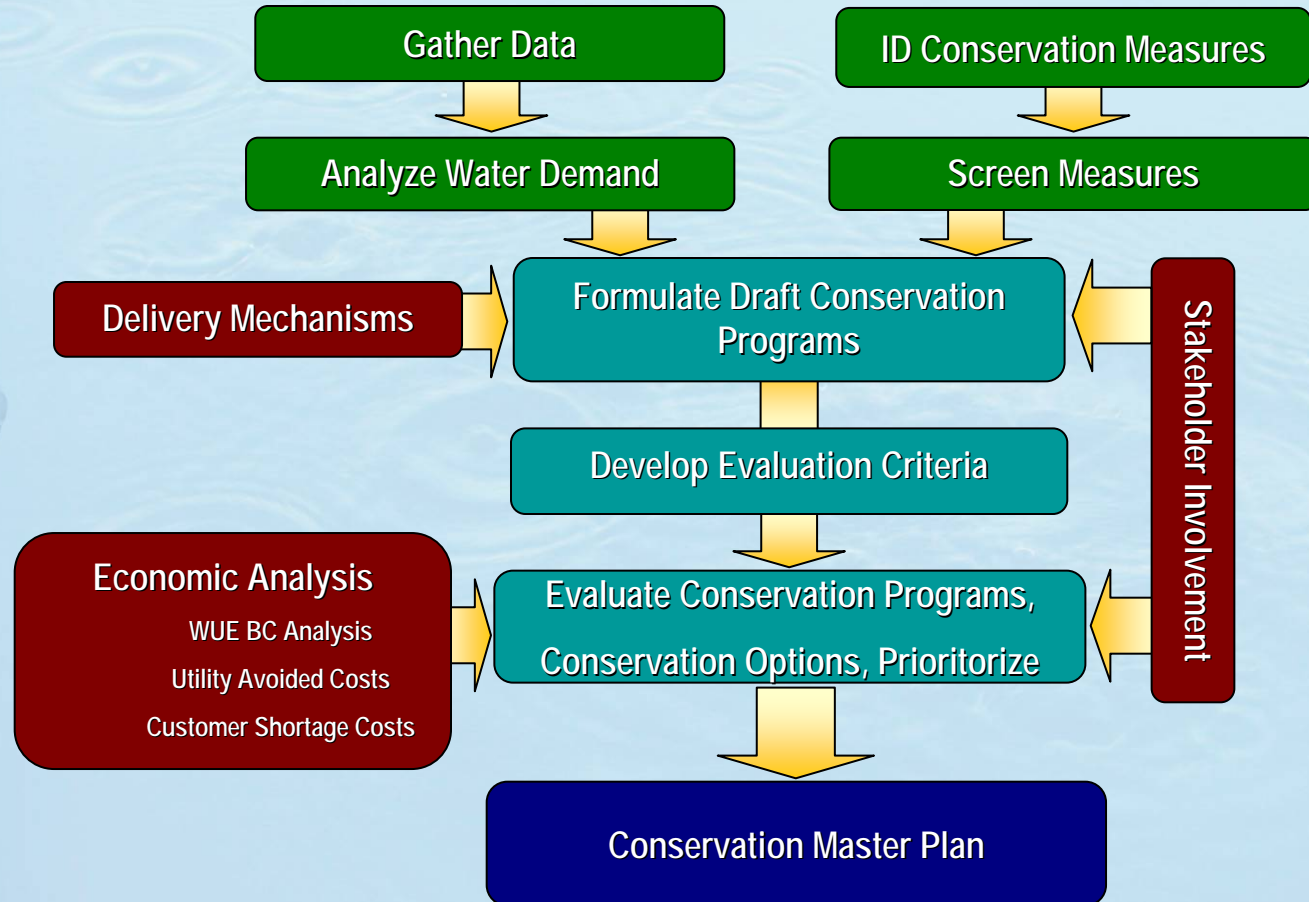
# Master Plan – 6 Steps



1. Develop Approach
2. Perform Analysis
3. Identify Opportunities
4. Evaluate Options
5. Receive Stakeholder Input
6. Recommend Program Portfolio & Implementation Plan



# Step 1 - Approach Flow Chart



# 1. Approach: Terminology



- Conservation Measures
  - Technologies, Plumbing Fixtures, Management Practices,
- Delivery Mechanism
  - Education, Rebates, Incentives, Direct Install, Ordinances
- A Conservation Program =
  - Conservation measure(s) + delivery mechanism

# 1. Conservation Measures



Residential	Landscape	CII
<b>Aerators</b>	Audits	Analyst Survey I
Flappers w/Survey	Central Controllers	Analyst Survey II
<b>High-Efficiency Washers</b>	Education – Mem Agy	Cooling Tower Cond Meter
Irrig Eval with Timers	ET Controllers	Engineer Survey
Irrig Eval without Timers	Irrigation Controllers	Flush Valve Kit
Multi-Family Surveys	Moisture Sensors	<b>High-Efficiency Washers</b>
Weather-Based Controller	Protector del Agua Class	Industrial Process Improve
<b>Showerheads</b>		<b>Pre-Rinse Spray Head</b>
Showerheads – Distributed		HET Toilets - Dual Flush
Surveys, Single Family		<b>ULF Toilets - Flush Valve</b>
Surveys, Single Family-Old		<b>ULF Toilets - Tank Type</b>
Toilet Displacement		<b>ULF Urinals</b>
<b>HET Toilets – Distribution</b>		Water Broom
<b>HET Toilets – Rebate</b>		Water Management Study
HET Toilets - Dual Flush		X-Ray Processor

# 1. Delivery Mechanisms

- How can Conservation Measures be delivered?
- Delivery Mechanisms include a range

**Education,  
Public  
Awareness**

**Program Marketing,  
Rebates & Incentives**

**Legislation  
Ordinances  
Regulation**

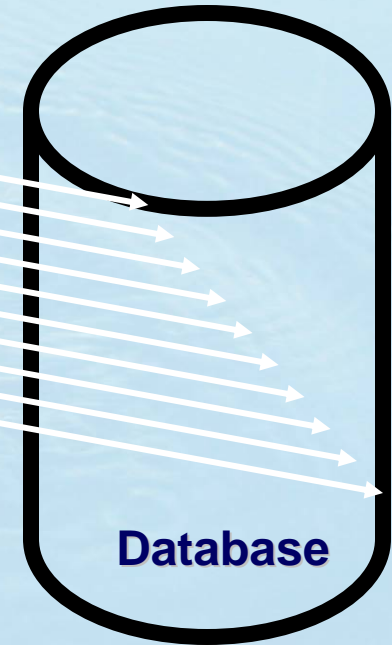
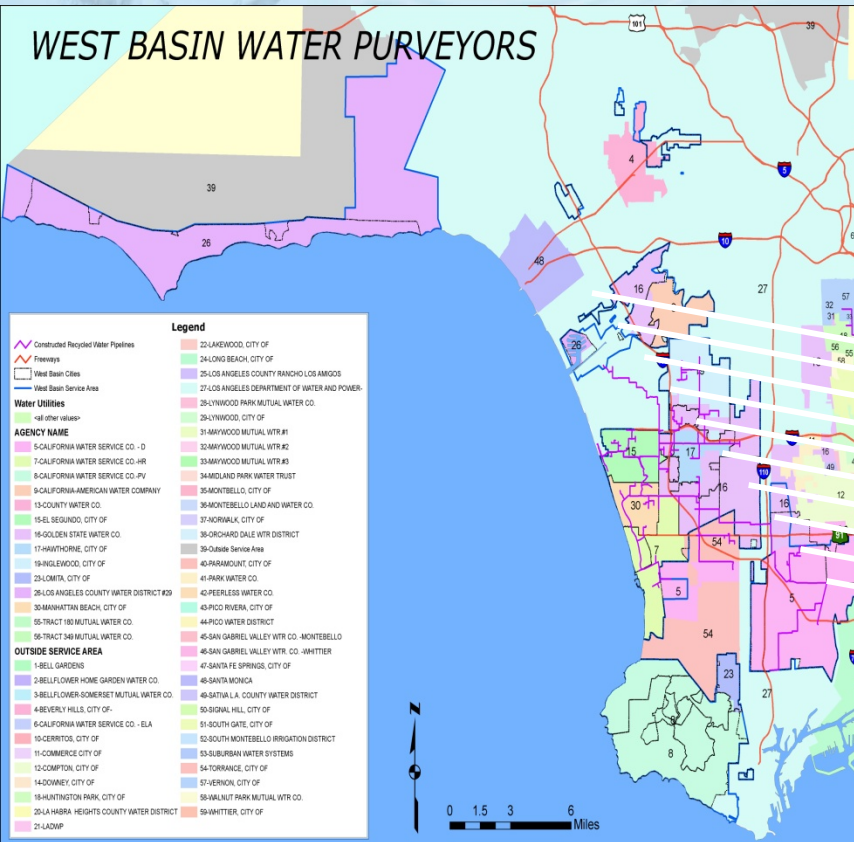


# Step 2 - Perform Analysis

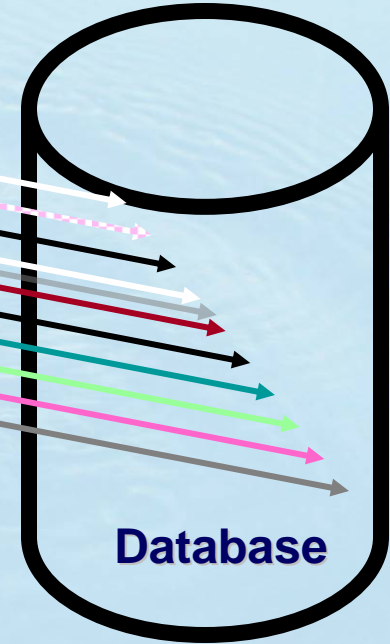
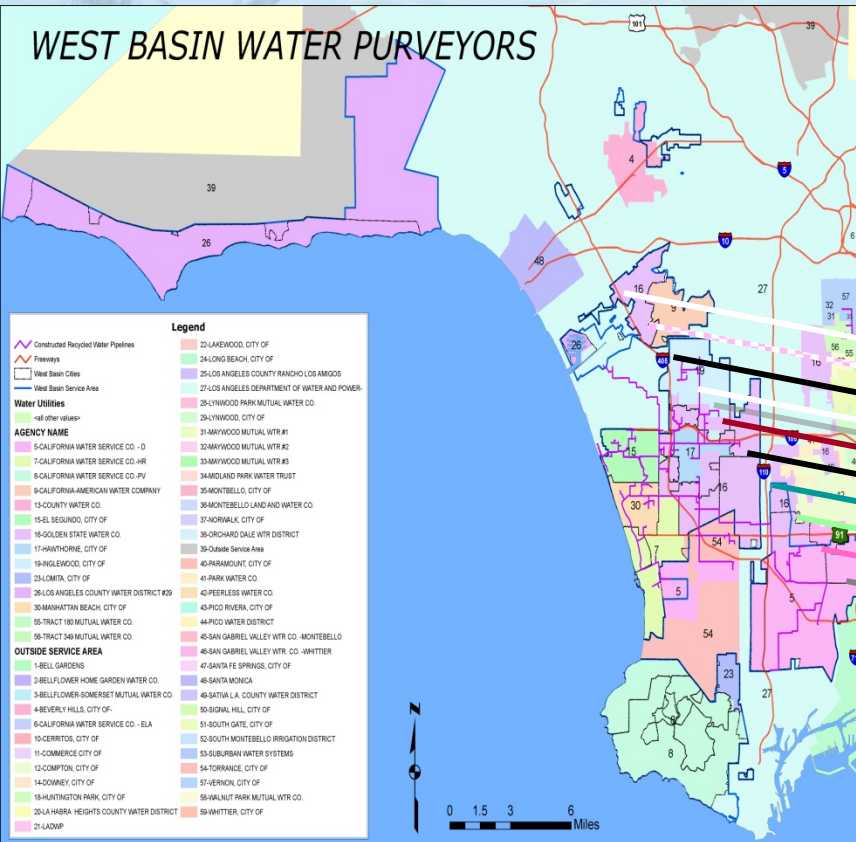


1. Retailer Data - Export Customer Data From Billing System
2. Develop a Master Database
3. Number and Type of Accounts (i.e. residential, CII, agriculture, etc.)
4. Code Data (SIC or NAICS)
5. GIS Demographic Data
6. Geocode Data

# 2. Consumption Data



# 2. Consumption Data



# 2. Account-Level Data



- Collected nearly 16 thousand CII accounts

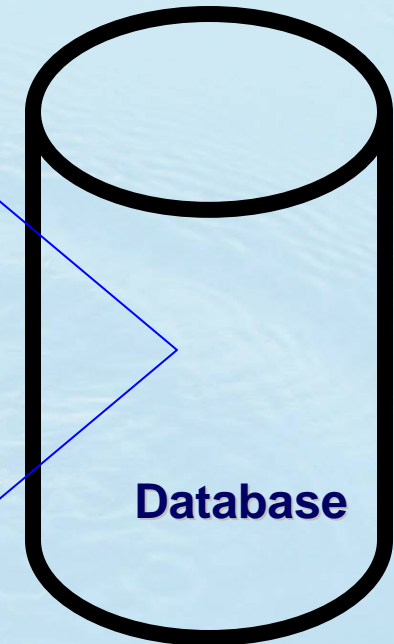
Account	Service Address	Service City	State	ZIP	Account Type	Meter Size	Feb	Mar	Apr
	6334 Chalet Dr	Hermosa Beach	CA	900403706	Business Metered	2" meter	3	6	3
	5999 Bandini Blvd	Redondo Beach	CA	900402902	Industrial Metered	2" meter	26	91	48
	4710 S Eastern Ave	Palos Verdes	CA	900402913	Industrial Metered	1" meter	8	20	6
	3328 Boxford Ave	Redondo Beach	CA	900403002	Business Metered	2" meter	14	28	14
	7001 Lanto St 107	Hawthorne	CA	900403713	Business Metered	5/8" meter	3	3	1
	6201 Randolph St	Hermosa Beach	CA	900403514	Industrial Metered	4" meter	520	1,246	750
	6819 Watcher St	Redondo Beach	CA	900403715	Business Metered	1" meter	8	14	11
	6817 Watcher St	Torrance	CA	900403715	Business Metered	1" meter	2	40	2
	6730 Lanto St	Rancho Dominguez	CA	900403729	Business Metered	5/8" meter	51	94	47
	7200 Dominion Cir	Torrance	CA	900403647	Business Metered	1-1/2" meter	69	62	64
	6651 E 26th St	Commerce	CA	900403215	Business Metered	1-1/2" meter	1	2	1
	6560 Bandini Blvd	Compton	CA	900403120	Industrial Metered	1-1/2" meter	0	0	0
	5959 Randolph St	Redondo Beach	CA	900403416	Industrial Metered	3" meter	94	161	81

- Residential consumption from UWMPs



# 2. Matching to External Data

- Demographics
- Urban Water Management Plans
- NAICS Codes
- Assessor Parcel Data
- Geocodes



# 2. Demographics



- Census data in SCAG RTP Files
  - Cal. State Fullerton GIS extraction
  - Summarize by District, Division, Retailer

City of Inglewood						
Statistic/Year	2005	2010	2015	2020	2025	2030
Persons per Occupied Dwelling Unit (Household)	2.93	2.88	2.85	2.82	2.79	2.76
Total Population	94,212	96,699	98,892	101,053	103,121	105,105
Non-Institutionalized Population	670	682	640	651	663	699
Resident Population	92,820	95,295	97,774	99,915	101,961	104,095
Retail Employment	6,166	6,580	6,728	6,895	7,038	7,170
Service Employment	24,871	28,956	30,493	31,215	31,866	32,576
Other Employment	13,782	13,951	13,551	13,863	14,144	14,273
Occupied Single Family Dwelling Units	10,261	10,523	10,249	10,602	10,947	10,765
Occupied Multiple Family Dwelling Units	21,400	22,652	24,066	24,881	25,676	27,007
Number of Workers	35,501	37,960	39,143	40,265	41,277	42,409
Land Area (Acres)	4,905					

# 2. NAICS Codes



- 6-digit business type indicator
- Submitted ~11k accounts to D&B
  - 70% matched
  - 4k NAICS from retail agency

NAICS Name (Look up)	Average of NAICS	Sum of Number Accounts	Sum of Consumption (ccf/yr)	Average of Consumption (ccf/yr) <sup>2</sup>
Sugar and Confectionery Product Manufacturing	3113	8	1,373	1,373
Other Nonmetallic Mineral Product Manufacturing	3279	8	1,480	740
Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing	3334	10	1,630	815
Semiconductor and Other Electronic Component Manufacturing	3344	12	1,799	1,799
Basic Chemical Manufacturing	3251	6	1,836	918
Apparel Accessories and Other Apparel Manufacturing	3159	4	2,056	2,056
Rubber Product Manufacturing	3262	7	2,205	1,103
Engine, Turbine, and Power Transmission Equipment Manufacturing	3336	7	2,344	1,172
Agriculture, Construction, and Mining Machinery Manufacturing	3331	15	2,612	1,306

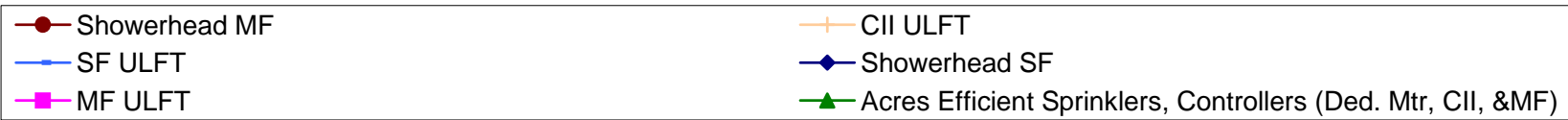
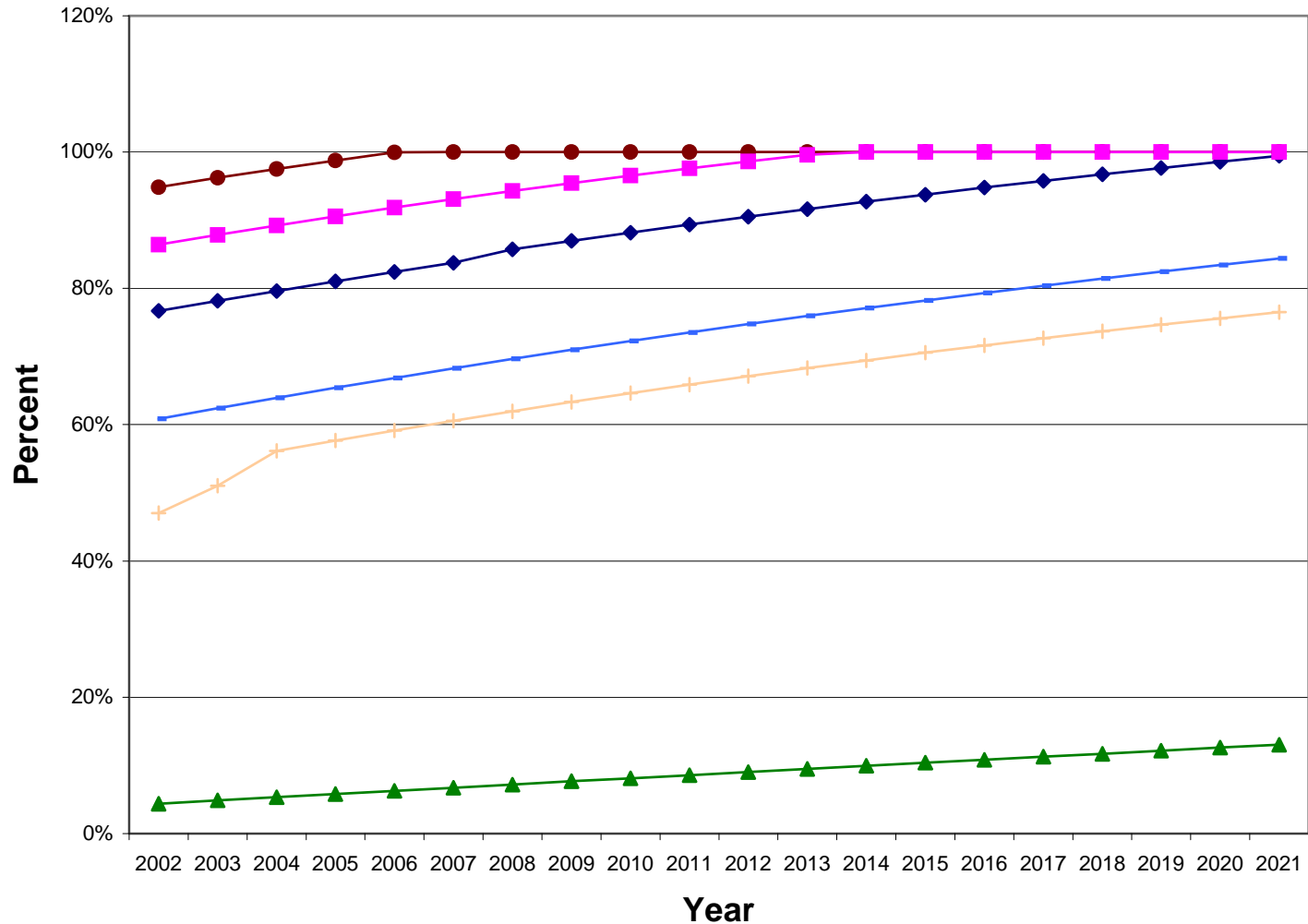
# 2. Parcel Assessor Data



- LA County GIS Boundary File
  - Extracted parcel IDs and area for WBMWD (225k parcels)
- Assessor Parcel Data (DS04 File)
  - Analyzed “Use Code”

usecode	mean(area)	Freq.	First	Second	Third	Fourth
1720	8,256	79	COMMERCIAL	OFFICE BUILDING	OFFICE AND RESIDENTIAL	ONE STORY
1722	2,451	2	COMMERCIAL	OFFICE BUILDING	OFFICE AND RESIDENTIAL	TWO STORIES
1724	18,155	1	COMMERCIAL	OFFICE BUILDING	OFFICE AND RESIDENTIAL	FOUR STORIES
1800	17,615	49	COMMERCIAL	HOTEL AND MOTEL	HOTEL UNDER 50 ROOMS	ONE STORY
1801	39,129	2	COMMERCIAL	HOTEL AND MOTEL	HOTEL UNDER 50 ROOMS	ONE STORY
180G	4,945	4	COMMERCIAL	HOTEL AND MOTEL	HOTEL UNDER 50 ROOMS	MILLS ACT PROPERTY
1810	70,296	21	COMMERCIAL	HOTEL AND MOTEL	HOTEL 50 ROOMS AND OVER	ONE STORY
1811	66,677	3	COMMERCIAL	HOTEL AND MOTEL	HOTEL 50 ROOMS AND OVER	ONE STORY
1812	194,386	1	COMMERCIAL	HOTEL AND MOTEL	HOTEL 50 ROOMS AND OVER	TWO STORIES
1813	60,143	2	COMMERCIAL	HOTEL AND MOTEL	HOTEL 50 ROOMS AND OVER	THREE STORIES
1814	186,166	1	COMMERCIAL	HOTEL AND MOTEL	HOTEL 50 ROOMS AND OVER	FOUR STORIES
1815	192,877	1	COMMERCIAL	HOTEL AND MOTEL	HOTEL 50 ROOMS AND OVER	FIVE STORIES

# Device Saturation



# Step 3 - Identify Local District Opportunities



Industrial Customers	1,600
Commercial Cooling Towers	250
Food Facilities	600
Outdoor Landscape	106,000 Acres
Residential Toilets (non ULFT)	264,000 Toilets

# 3. Local Opportunities

	<b>Carson</b>	<b>Inglewood</b>	<b>Manhattan Beach</b>	<b>Lawndale</b>	<b>El Segundo</b>
<b>Residential Toilets</b>					
<b>Industrial Customers</b>	<b>239</b>	<b>1</b>	<b>8</b>	<b>7</b>	<b>212</b>
<b>Laundromats</b>	<b>6</b>	<b>6</b>	<b>7</b>	<b>1</b>	<b>1</b>
<b>3 Story Buildings</b>					
<b>Medical Facilities</b>	<b>64</b>	<b>9</b>	<b>21</b>	<b>17</b>	<b>103</b>
<b>Markets</b>	<b>39</b>	<b>10</b>	<b>2</b>	<b>9</b>	<b>14</b>

# 3. Conservation Measures Identified



**MEASURE GUIDE**

	Ultra Low Flush Toilets (ULFTs)	
	RESIDENTIAL	COMMERCIAL
<b>Devices</b>		
<b>Types of Programs</b>	<ul style="list-style-type: none"> <li>Rebate or Voucher</li> <li>Distribution</li> <li>Direct Installation</li> <li>Vendor delivery (mf)</li> <li>Retrofit on resale ordinance</li> </ul>	<ul style="list-style-type: none"> <li>Rebate or Voucher</li> <li>Direct Installation</li> <li>Vendor delivery</li> <li>Valve replacement</li> </ul>
<b>Description</b>	<p>1.6 gallons per flush (gpf) Mandated since 1992; maximum 1.6-gpf sold in CA. Since 1994 only 1.6 sold in US.</p> <p>Residential toilets are typically tank-type models with round bowls. There are two types of tank models: gravity fed and pressure assisted. Gravity toilets are the most common type. They rely on the weight of the water and head pressure to remove the waste through the trap. Pressure assisted models supply line pressure to force the waste through the trap. Pressure assisted models typically costs \$100+ more. There is also a third type, vacuum gravity models, a hybrid of the these two.</p>	<p>1.6 gallons per flush (gpf) Mandated since 1994; maximum 1.6-gpf installed in US. (except for blowout toilets, for which maximum is 3.5-gpf)</p> <p>There are two types of toilets installed in commercial facilities: flushometer valve and tank-types. Flushometer valve toilets are activated through a handle or automatic sensor located above the toilet bowl. They tend to be installed in locations that receive high use. Tank-type toilets are similar to residential models except when used by the public are required to have an elongated bowl.</p> <p>Sloan has introduced a the Crown Flushometer Valve which can not be inadvertently retrofitted to use more than 1.6 gallons per flush as is the case with the Sloan crown valves as well as those from other manufacturers</p>
<b>Savings</b>	<ul style="list-style-type: none"> <li>Single Family 21 – 27 gpd</li> <li>Multi Family 36 – 63 gpd</li> <li>Depends on persons per household and toilets per household</li> </ul>	<ul style="list-style-type: none"> <li>16 – 57* gpd</li> <li>*Depends on type of facility and amount of use</li> </ul>



# 3. Program Design

- Identify promising measures  
(See *Measure Guide*)
- Sculpt a delivery mechanism
- Estimate program costs and benefits

# Step 4 - Evaluate Options



- Pre-rinse Spray Valve Installations
- Restroom Retrofit
- ULFT or HET Rebate
- HET Distribution
- Clothes Washer Rebates
- Conductivity Controllers for Cooling Towers
- Save A Buck Commercial Incentives
- Smart Controller Distribution
- Residential HEW Washer Rebates
- Irrigation Equipment Incentives
- Laundromat Retrofit
- Large Landscape Water Budgets
- Supermarket Retrofit
- Industrial Process Audits and Incentives
- Medical Facilities Retrofit

# 4. Program Evaluation

	Evaluation Criteria				
	1	2	3	4	5 ...
<b>Existing Program 1</b>					
<b>Existing Program 2</b>					
<b>New Program 1</b>					
<b>New Program 2</b>					

?

# 4. Develop Evaluation Criteria



- Cost Effectiveness
- Water Savings Potential
- Implementation
- Certainty of Water Savings
- Additional Benefits
- Public Relations Value
- Outside Funding Potential
- Quickly Scalable

# 4. Screening Conservation Measures



<b>High Cost-Effectiveness</b>		<b>“No Brainer”</b>
<b>Low Cost-Effectiveness</b>	<b>“Loser”</b>	
	<b>Low</b>	<b>High</b>
	<b>Implementation Feasibility</b>	

# 4. Recommended Program Ranking



Laundromat Retrofit	102
Smart Controller Distribution	95
Conductivity Controller Incentives	83
Irrigation Equipment Incentives	80
Industrial Process Audits & Incentives	80
Supermarket Retrofit	80
Large Landscape Water Budgets	69
Medical Facility Retrofit	50

# 10 Min. BREAK

# Step 5 - Stakeholder Input

- To receive input on recommended programs
- Over 100 participants in two workshops
- Cities, retail agencies, environmental groups, vendors
- Verbal, written feedback on programs and outreach



# 5. Stakeholder Input

- Received Feedback on Each Program
- Stakeholder Interest:
  - HET program
  - Laundromat program
  - General landscape & irrigation
  - Weather based irrigation controllers
  - Car wash recirculation systems
  - Industrial process

## Metropolitan Service Area Supplies

Yesterday Today Tomorrow



Early 1990's

Heavy dependence on imported supplies

Less than half of the supplies



# 5. Final Ranking of Recommended Programs



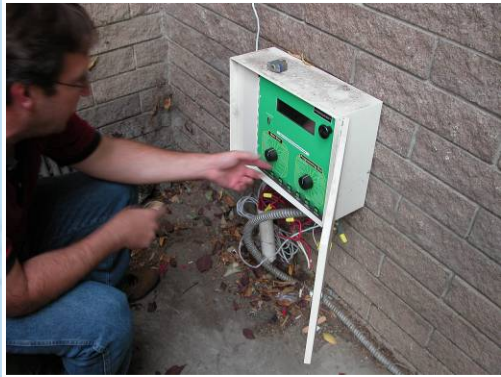
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Medical Facility Retrofit	50

# 5. Laundromat Retrofit



Status:	New Program
Technology:	Commercial, coin-operated
Offer:	Substantial incentive from multiple utilities
Rationale:	Cash-limited Laundromats need substantial incentives to replace early models.
Target Market:	Laundromats
Partners:	Gas Co., Edison, MWD
Annual Budget:	\$37,500
Required Staff:	.10 FTE

# 5. Smart Controller Distributions



Status:	New Program
Technology:	Irrigation Controllers
Offer:	Free product distributions at events similar to toilet distributions
Rationale:	Product is not readily available, distribute to promote market transformation
Target Market:	- Single family, Multi family - Commercial, Industrial
Partners:	MWD and DWR
Annual Budget:	\$68,000
Required Staff:	.25 FTE

# 5. Cooling Tower Conductivity Controller Incentive Program



<b>Status:</b>	<b>New Program</b>
<b>Technology:</b>	<b>-Conductivity controllers - pH controllers</b>
<b>Offer:</b>	<b>Prescriptive incentives for installation of conductivity and pH controllers</b>
<b>Rationale:</b>	<b>- Most cost effective product - Engage water treatment trades to help transform market</b>
<b>Target Market:</b>	<b>Buildings over 3 stories</b>
<b>Partners:</b>	<b>MWD and LADWP</b>
<b>Annual Budget:</b>	<b>\$60,000</b>
<b>Required Staff:</b>	<b>.5 FTE</b>

# 5. Irrigation Equipment Rebate Program: Pilot



<b>Status:</b>	<b>New Program</b>
<b>Technology:</b>	<ul style="list-style-type: none"><li>- Matching heads</li><li>- Pressure regulators</li><li>- Weather-based controllers</li></ul>
<b>Offer:</b>	<b>Customized Incentives</b>
<b>Rationale:</b>	<b>Incentives are needed to spur irrigation equipment upgrades to improve water efficiency.</b>
<b>Target Market:</b>	<b>Large landscape customers</b> <ul style="list-style-type: none"><li>- Multi family, Commercial, Institutional</li></ul>
<b>Partners:</b>	<b>MWD</b>
<b>Annual Budget:</b>	<b>\$80,000</b>
<b>Required Staff:</b>	<b>.5 FTE</b>

# 5. Industrial Process Audits & Incentives



<b>Status:</b>	<b>New Program</b>
<b>Technology:</b>	<b>Process water use reduction and reuse technologies</b>
<b>Offer:</b>	<b>Customized incentives based upon the amount of water saved</b>
<b>Rationale:</b>	<b>Most potential for savings on per site basis. Build on MWD's existing program</b>
<b>Target Market:</b>	<b>Industrial Processes such as:</b> <b>- Food processing, textiles, fabricated metals, electronics, and industrial laundries.</b>
<b>Partners:</b>	<b>MWD</b>
<b>Annual Budget:</b>	<b>\$225,250</b>
<b>Required Staff:</b>	<b>.5 FTE</b>

# 5. Supermarket Program



<b>Status:</b>	<b>New Program</b>
<b>Technology:</b>	<ul style="list-style-type: none"><li>- Pre-rinse spray valves, High Efficiency Toilets, Waterbrooms</li><li>- Conductivity controllers for evaporative condensers</li></ul>
<b>Offer:</b>	<ul style="list-style-type: none"><li>-Free product and installation of spray valves, HETs and waterbrooms</li><li>- Incentive for conductivity controllers</li></ul>
<b>Rationale:</b>	There are plenty of supermarkets but they are low margin businesses and need free products and installations
<b>Target Market:</b>	Supermarkets and food stores
<b>Partners:</b>	MWD
<b>Annual Budget:</b>	\$50,000
<b>Required Staff:</b>	.25 FTE



# 5. Large Landscape Water Budgets: Pilot



<b>Technology:</b>	<b>Water Budget</b>
<b>Offer:</b>	<b>Water budget with regular communication regarding actual performance to budget</b>
<b>Rationale:</b>	<b>Currently bill payer is not in control of the amount of irrigation. Educate all parties including property owners/managers, home owners associations and landscape service providers and they will adjust their irrigation habits</b>
<b>Target Market:</b>	<b>Large landscape customers, specifically home owners associations</b>
<b>Annual Budget:</b>	<b>\$80,000</b>
<b>Required Staff:</b>	<b>.25 FTE</b>

# 5. Medical Facilities Rebate



<b>Status</b>	<b>New</b>
<b>Technology</b>	<ul style="list-style-type: none"><li>- High efficiency toilets, Pre-rinse spray valves-</li><li>- Waterbrooms, Conductivity controllers</li></ul>
<b>Offer</b>	<ul style="list-style-type: none"><li>- Free product and installation for film processors, spray valves and HETs</li><li>- Incentive for conductivity controllers</li></ul>
<b>Rationale</b>	<ul style="list-style-type: none"><li>-There are plenty of hospitals.</li><li>-Many have major participation barriers: main f - Focus customer care, tight budgets and stringent regulations are why program must be turn-key</li></ul>
<b>Target Market</b>	Hospitals and medical facilities with long hours of operation
<b>Partners</b>	MWD
<b>Annual Bgt</b>	\$45,085
<b>Required Staff</b>	.25 FTE

# 5. Pilots, Studies and Demos: Car Wash Study



Status	New Study
Technology	Car wash recirculation water systems
Offer	Determine offer based upon results of study
Rationale	Car wash recirculation systems save significant amounts of water, however many car washes have already implemented this technology. Research needs to be done on market saturation and barriers.
Target Market	Car washes

# 5. Pilots, Studies and Demos: Artificial Turf Demonstration



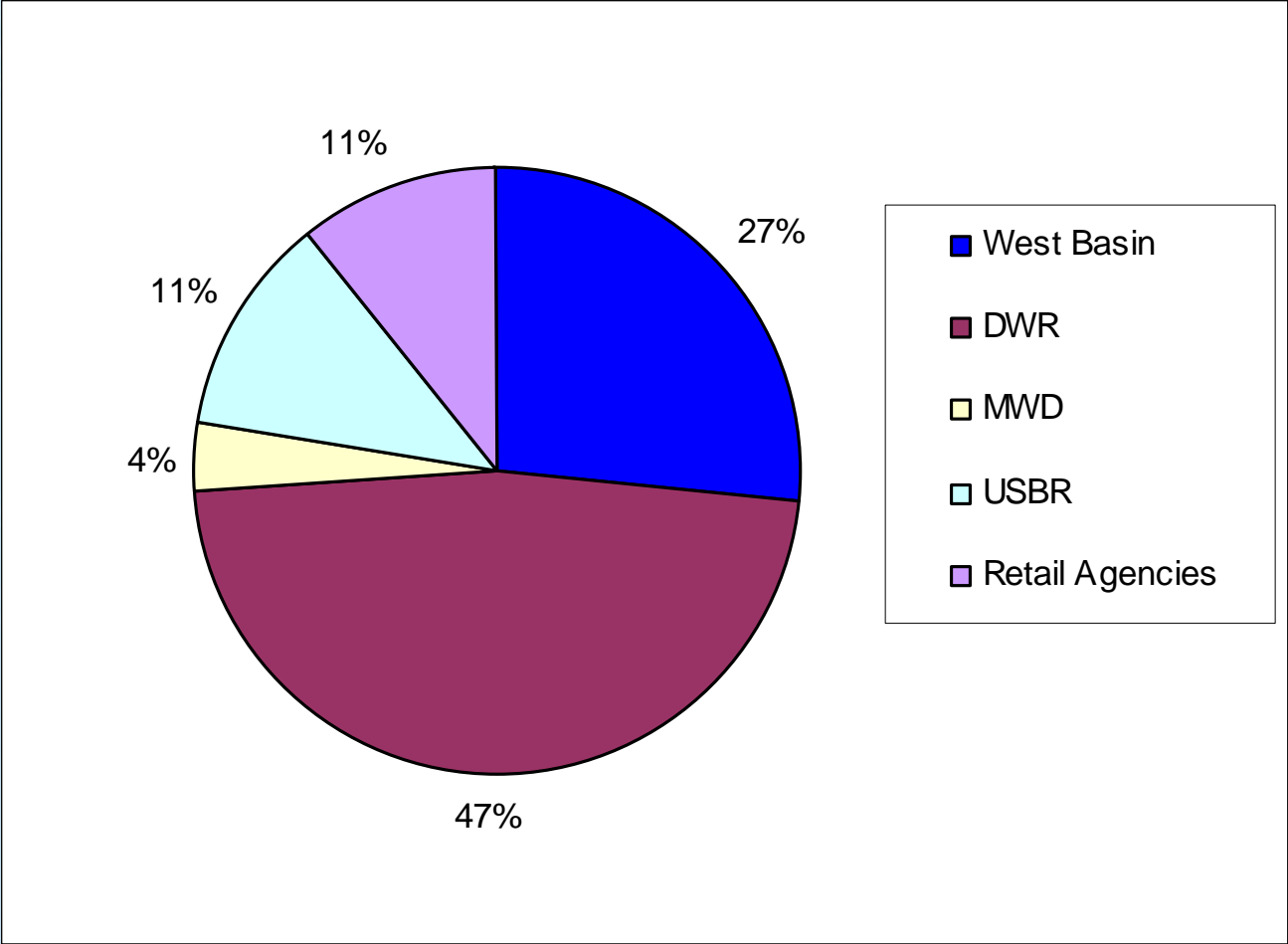
Status	New Demonstration Project
Technology	Artificial (synthetic) turf
Offer	Demonstration Project
Rationale	Demonstration could educate customers not only about artificial turf but water efficiency in general if located in a high traffic school or park.
Partnerships	Potential corporate sponsorships
Target Market	- School sports field, parks

# Step 6 - Implementation Plan

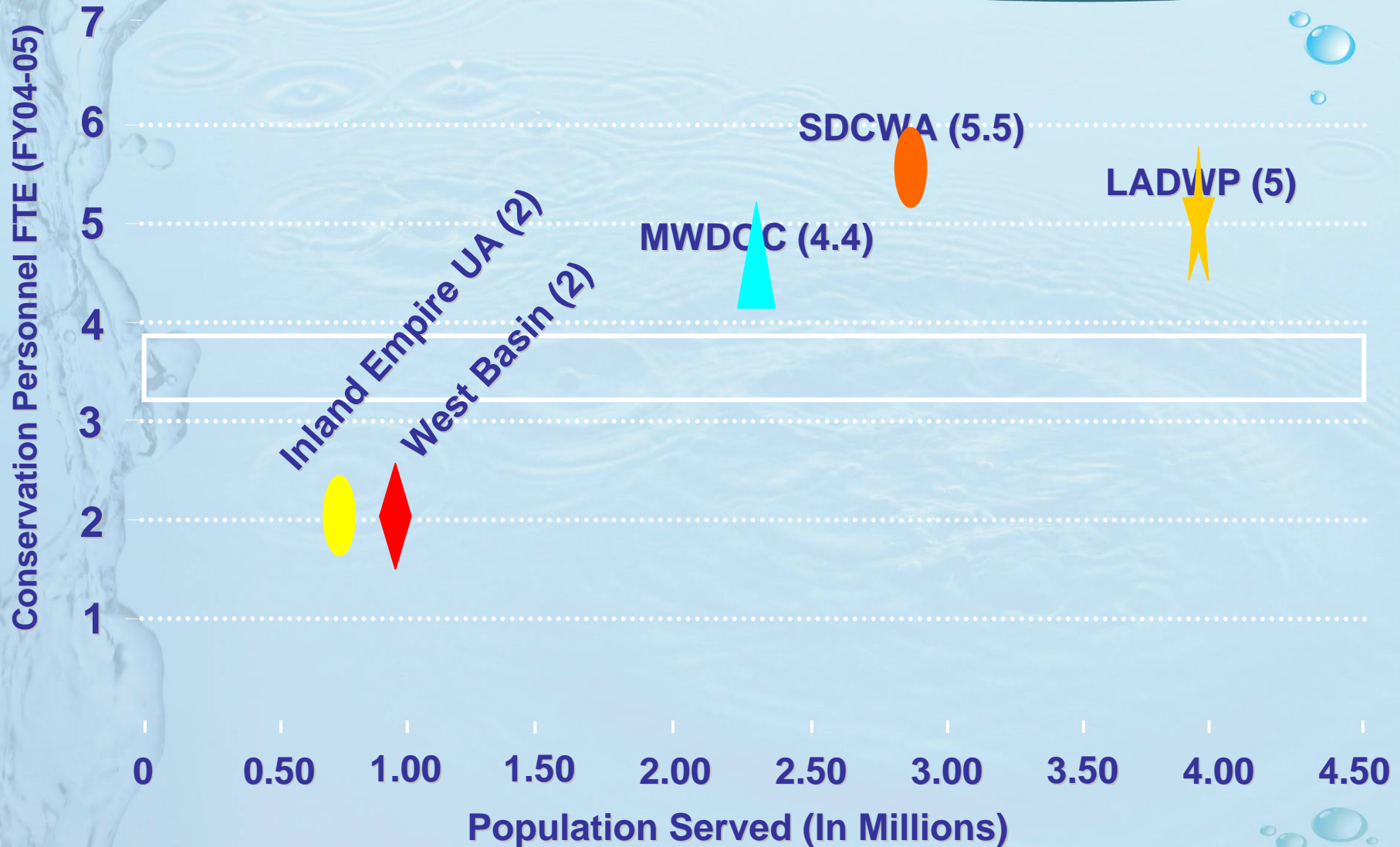


- Budget Implications
- Staffing Requirements
- Variety in Portfolio
- Transitioning Existing Programs

# 6. Leveraged Funding



# 6. Benchmarking Agencies Full-Time Equivalents (FTEs)



# 6. Five Year Implementation Plan



PROGRAMS	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10	FY 10-11
HET DISTRIBUTIONS	[Solid blue bar]					
SMART CONTROLLER DISTRIBUTIONS		[Solid blue bar]				
PRE-RINSE SPRAY VALVE INSTALLS	[Solid blue bar]					
RESIDENTIAL ULFT REBATES	[Solid blue bar]					
HET & WASHER REBATES	[Solid blue bar]					
SAVE-A-BUCK CII INCENTIVES	[Solid blue bar]					
COMPLETE RESTROOM RETROFIT	[Solid blue bar]			[Yellow hatched bar]		
LAUNDROMAT WASHER REBATES		[Solid blue bar]				
IRRIGATION EQUIP. / WATER BUDGET		[Solid blue bar]				
CONDUCTIVITY CONT. INCENTIVE			[Solid blue bar]			
INDUSTRIAL PROCESS IMPROVEMENT			[Solid blue bar]			
SUPERMARKET RETROFIT					[Solid orange bar]	
<b>EST. ANNUAL WATER SAVINGS (AF)</b>	<b>282</b>	<b>355</b>	<b>403</b>	<b>381</b>	<b>341</b>	<b>382</b>



- Study tiered water rates (retail, wholesale)
- Implement education programs
- Support ordinances and legislation

# Preliminary Outreach Plan



- Customer Agency Outreach
  - Offer tailored outreach & marketing
  - Partner with South Bay Cities COG
- Public Awareness
  - Print, Media, and Web Site
  - Director outreach
  - Current Senior Community Outreach
- Environmental groups, other stakeholders
- CUWCC Support

# Other Action Plan Elements



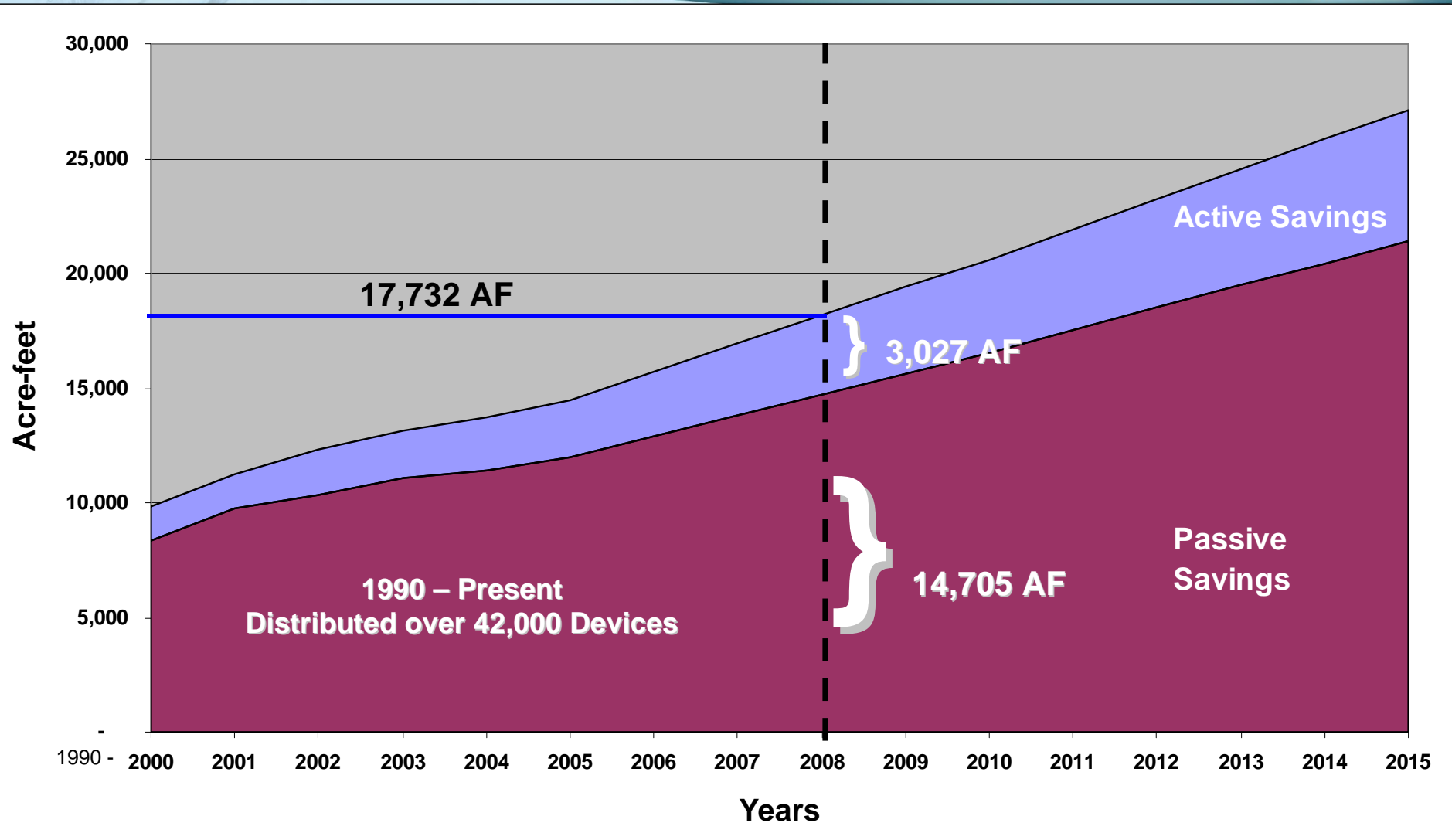
- Policy Principles
- Partnerships
- Marketing & Outreach
- Long-term Revenue Sources

# Conclusion: Revising the Plan



- Conservation programs are a means to an end (saving water)
- Costs and Benefits define the “E” in WUE
- Measurement and evaluation allows programs to adapt

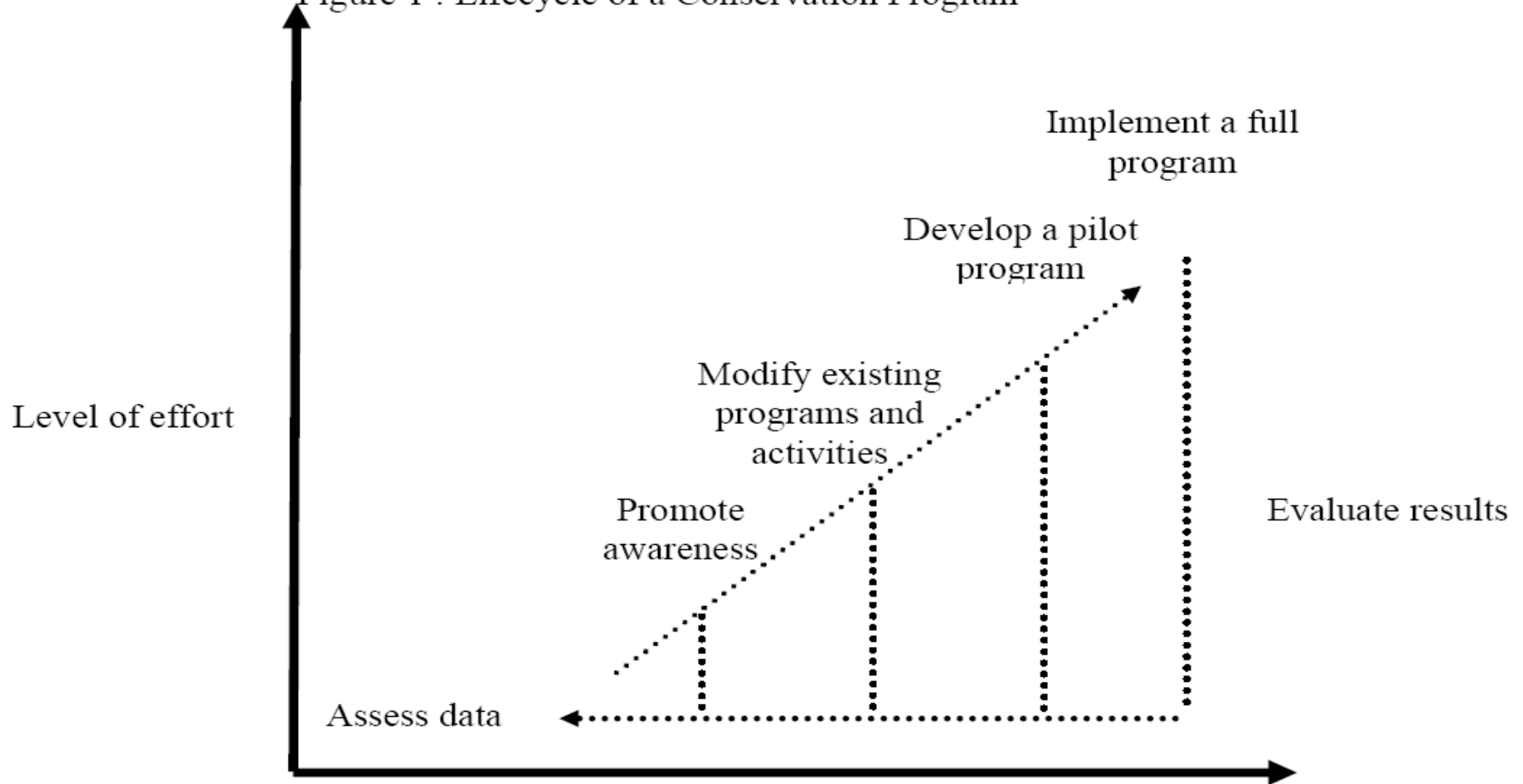
# Water Conservation Target



# Lifecycle of Conservation Programs



Figure 1 : Lifecycle of a Conservation Program



Source: *Socioeconomic Impacts of Conservation*, AwwaRF 2001.

# Avoided Cost Model



Microsoft Excel - CUWCCAwwaRF\_Direct Utility Avoided Cost Model Test 05-23-05.xls

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A B C D E

## Direct Utility Avoided Cost Estimation Model, Version 05.10.05

### Common Assumptions



Enter Common Assumptions:

8	Planning horizon (year)	2040
10	Cost Reference Year	2005
12	Lost and Unaccounted for Water (%)	10%
14	Peak-Season Start Date ('xx/xx')	1-Jun
15	Peak-Season End Date ('xx/xx')	31-Oct
17	Real Discount Rate	3.92%

Discount Rate Converter (Optional)	
<i>IF:</i>	
Nominal Discount Rate is:	6.00%
<i>AND</i>	
Projected Inflation Rate is:	2.00%
<i>THEN</i>	
Real Discount Rate is:	3.92%

**Discount rate is used for net present value (NPV) calculations. "Real" discount rates are net-of-inflation. See converter above.**

### Choose Units of Measurement

Measurement System

U.S. Units

Metric Units

U.S. System Volume Units

Million Gallons

Acre-Feet (AF)

Flow:	mgd
Volume:	mg

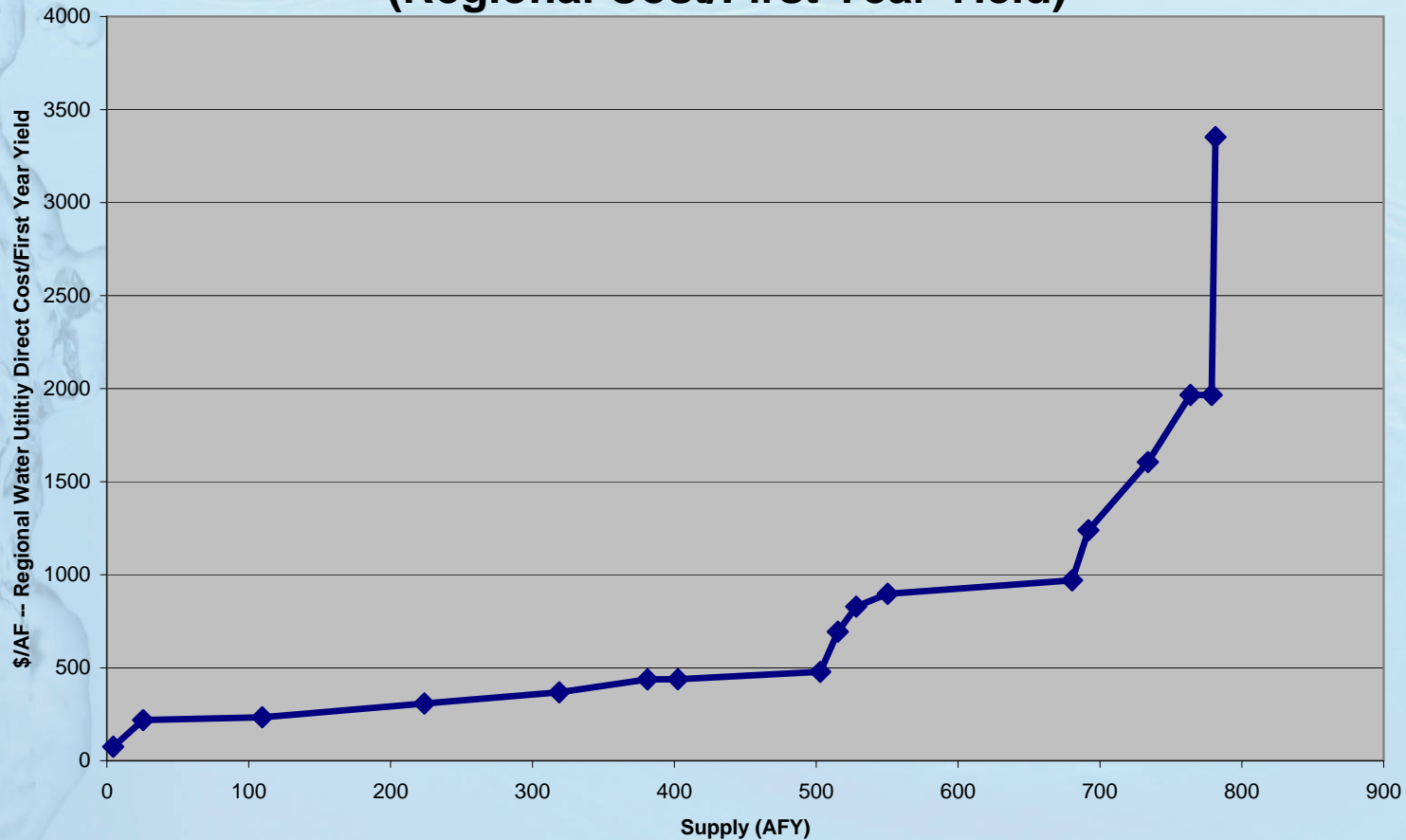
Common Assumptions / Non-Water Utility AC / Demands / Variable Op Costs / On Margin Probabilities / On-Margin Weighted

Cell B17 commented by T. Chesnutt

# Benefit-Cost Model—A Conservation Supply Curve



**Figure 7.4--Supply Curve from Conservation Programs  
(Regional Cost/First Year Yield)**

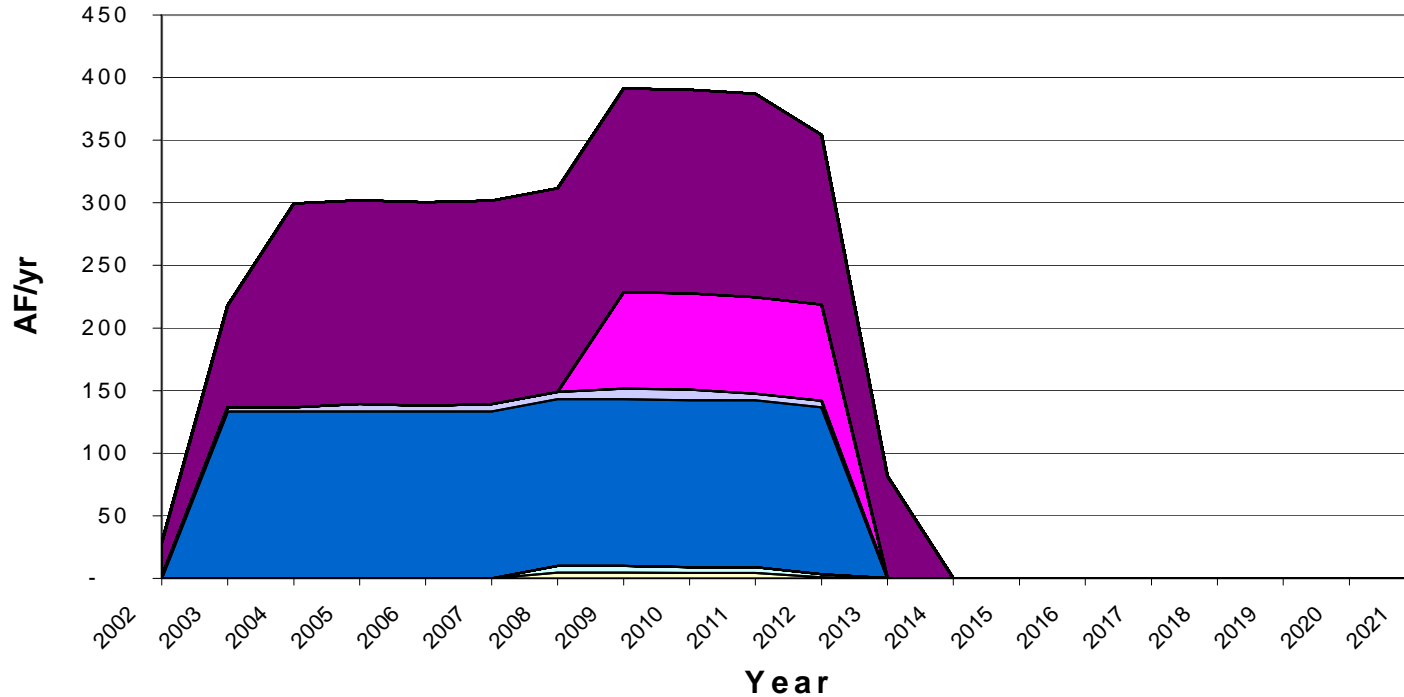




# Tracking Conservation Supply by BMP



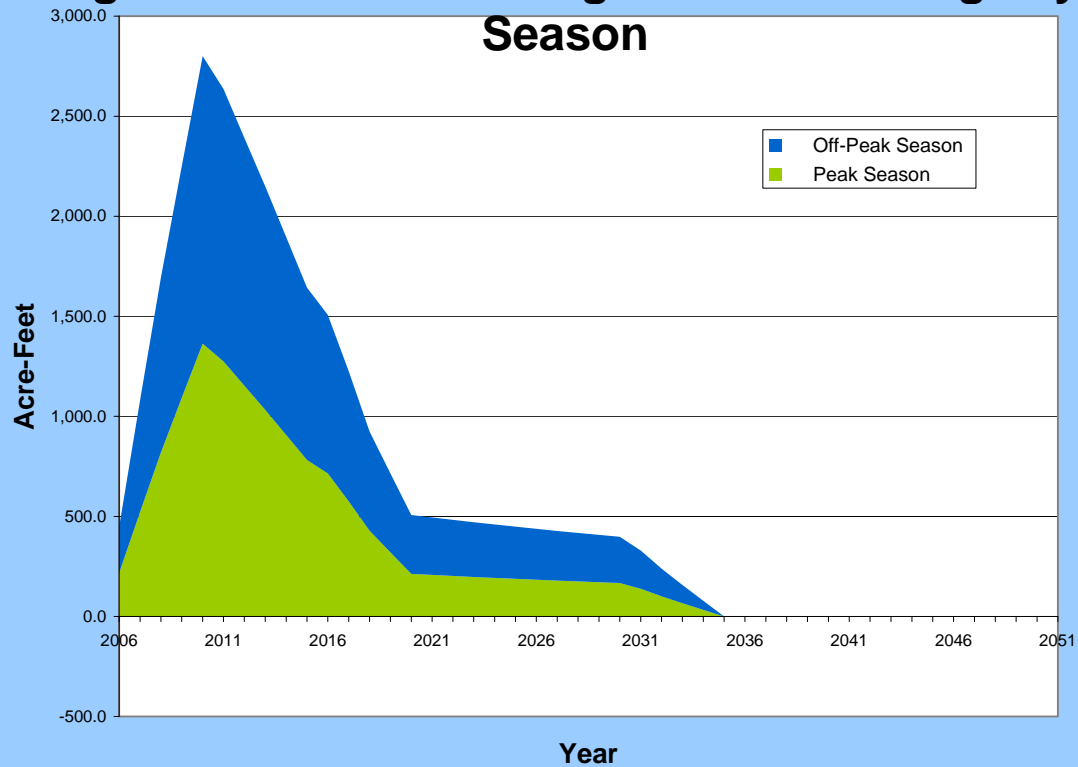
## Added Future Active Savings by Program



- |  |   |  |
|--|---|--|
| <ul style="list-style-type: none"> <li>■ BMP1 Survey SF</li> <li>■ BMP2 Retrofit MF</li> <li>■ BMP6 HE Washers</li> <li>■ BMP9 Survey: Institutional</li> <li>■ BMP14 Res. ULFT MF</li> <li>■ Comm HE Washers "BMP 6B"</li> <li>■ n/a</li> </ul> | <ul style="list-style-type: none"> <li>■ BMP1 Survey MF</li> <li>■ BMP5 Lg. Land: Ded. Meters</li> <li>■ BMP9 Survey: Commercial</li> <li>■ BMP9 CII ULFT</li> <li>■ Broadcast ET Controllers: SF</li> <li>■ SM Landscape Ord. (New Construction)</li> <li>■ n/a</li> </ul> | <ul style="list-style-type: none"> <li>■ BMP2 Retrofit SF</li> <li>■ BMP5 Lg. Land: Mixed Meters</li> <li>■ BMP9 Survey: Industrial</li> <li>■ BMP14 Res. ULFT SF</li> <li>■ MF HE Washers "BMP 6A"</li> <li>■ Lg. Land: Ded. Meter Surveys</li> </ul> |
|--|---|--|

# Seasonal Savings

**Figure 7.5 -- Annual Programmatic Savings by Season**



# Next Steps



- Incorporate Executive comments, produce final document
- Begin Year 1 Action Plan Implementation & Outreach

# More Feedback?



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**310-660-6209**

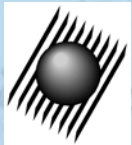
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