



Water Conservation Study Final September 30, 2015

Prepared For:



City of Austin Office of Sustainability & Austin Water Utility

Prepared by:



MADDAUS
WATER
MANAGEMENT INC.



WATER CONSERVATION STUDY

ACKNOWLEDGEMENTS

Thank you to the following agencies for their participation:

- Saving Water Partnership, Seattle, WA
- Portland Water Bureau, OR
- East Bay Municipal Utility District, CA
- Irvine Ranch Water District, CA
- Southern Nevada Water Authority, NV
- San Antonio Water System, TX
- Dallas Water Utilities, TX
- Austin Water, TX
- City West Water, Victoria, Melbourne, Australia
- Water Corporation, Western Australia, Australia
- Hunter Water, New South Wales, Australia

Their staff insights and images made this report possible.

TABLE OF CONTENTS

INTRODUCTION – LEADERS IN CONSERVATION	3
KEY SURVEY FINDINGS.....	3
Key Finding 1 – Successful Water Conservation Programs across Western United States and Australia	3
Key Finding 2 – Water Savings Goals	6
Key Finding 3 – Successful Conservation Measures	7
Key Finding 4 – Program Funding Source	7
Key Finding 5 – Costs and Staffing	7
Key Finding 6 –Commercial, Industrial and Institutional Customers (CII)	9
Key Finding 7 – Outdoor Water Savings.....	10
Key Finding 8 – Alternative Water Sources: Reclaimed Water, Grey Water, Rainwater Capture	11
Key Finding 9 – Rebates and Incentives	13
Key Finding 10 – Leakage Management: Pressure, Testing, Replacement, Leak Fixes, Automated Metering Infrastructure (AMI)	13
Key Finding 11 – Building Codes	14
Key Finding 12 – Communication with Customers	15
SUGGESTIONS FROM SURVEY PARTICIPANTS	20
PRELIMINARY RECOMMENDATIONS	21

WATER CONSERVATION STUDY

INTRODUCTION – LEADERS IN CONSERVATION

The City of Austin (Austin Water Utility) is interested in enhancing their water efficiency efforts. Currently, Austin Water Utility is implementing a comprehensive water conservation program.

As part of this effort, Austin Water Utility is seeking to learn innovative and new ways to further support its customers. They are interested in an analysis of their current efforts to reduce potable water usage; a comparison of their efforts to national and international best practices and leading peers; and recommendations for programs that should be stopped, modifications to be made, and new approaches to be tried.

With an emphasis on what other agencies with mature, successful water efficiency programs are doing, this report compiles the lessons learned as well as additional conservation elements for Austin Water Utility to consider. With direction from the Integrated Water Resources Task Force, this study includes some international as well as U.S. examples. The purpose of this report is to assist Austin Water Utility staff in focusing their efforts to maximize results through potable water use reduction.

The 2015 survey summarized in this brief report focused on 11 participating agencies with their answers to detailed questions on goals, measures, budgets, payment mechanism and staffing needs (see page 3).

KEY SURVEY FINDINGS

Key Finding 1 – Successful Water Conservation Programs across Western United States and Australia

The 11 agencies selected for the survey were chosen because they have mature, successful water conservation programs. Survey participants are

not only geographically diverse, but also have innovative ideas to share. The agencies vary in size from 370,000 population served to over 2 million. They are located in different states and countries and have water demands ranging from 61 million gallons day (MGD) to 418 MGD. The primary supply source is surface water for the majority of the water systems.

Despite their variation in location, size, and customer base, over the past two decades this survey's participating agencies have all created successful water efficiency programs that include a variety of different conservation measures. This is the first key finding. Each agency's program is unique and provides valuable lessons learned, as well as new ideas and information on how to enhance any conservation program.

Agencies Included in the Survey

- › Water Saving Partnership, Seattle, WA
- › Portland Water Bureau, OR
- › East Bay Municipal Utility District, CA
- › Irvine Ranch Water District, CA
- › Southern Nevada Water Authority, NV
- › San Antonio Water System, TX
- › Dallas Water Utilities, TX
- › Austin Water, TX
- › City West Water, Australia
- › Water Corporation, Australia
- › Hunter Water, Australia

WATER CONSERVATION STUDY

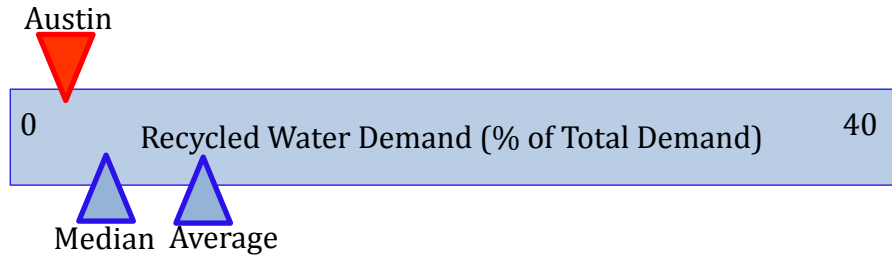
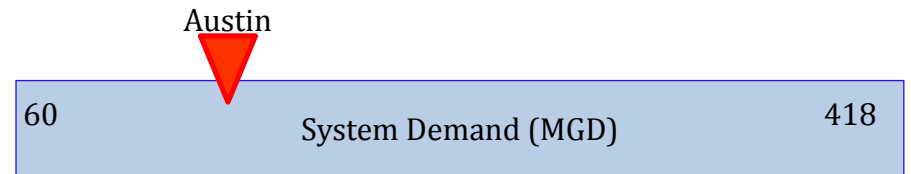
	Saving Water Partnership, Seattle	Portland Water Bureau	East Bay Municipal Utility District	Irvine Ranch Water District	Southern Nevada Water Authority	San Antonio Water System	Dallas Water Utilities	Austin Water	City West Water	Water Corporation	Hunter Water
State	Washington	Oregon	California	California	Nevada	Texas	Texas	Texas	Victoria (Australia)	Western Australia (Australia)	New South Wales, (Australia)
Approx Population Served	1,000,000	951,324 Whole system	1,300,000	370,000	2,035,959 (40 million visitors/yr)	1,740,000	2,400,000 Whole system 1,200,000 City	977,491	800,000	2,600,000	575,000
Major Metro Region	Seattle	Portland	Oakland	Irvine	Las Vegas	San Antonio	Dallas	Austin	Melbourne	Perth	Newcastle,
Number of agencies (cities and utilities)	19	20	35	6	7	1	28	1	8	8	1
Service Area size (sq. mi)	300	225	331	181	8,091	927	700	554	224	1,003,866 (most of West Australia)	2,576
System Demand (MGD)	94	98	183	84	418	212	370	118.5	79	269	61
Annual Conservation Budget (\$USD)	\$1,600,000	\$768,000	\$3,200,000	Varies on need and program types.	\$8,599,000	\$5,447,000	\$6,656,000 (City of Dallas only)	\$4,375,000	\$1,768,800	No information available	\$325,000
Conservation Spending \$/capita	\$1.60	\$1.57	\$2.46	Varies	\$4.22	\$3.13	\$5.35	\$4.48	\$3.00	No information available	\$0.57
Conservation Staff in FTE	5	No information available	14	5 FTE, 1 intern, 6 drought staff	18 SNWA staff members	19.4 FTE, 4 PT interns, 2 drought staff, 10 PT police	13	20	8	No information available	3

WATER CONSERVATION STUDY

Range of Survey Participants

City of Austin

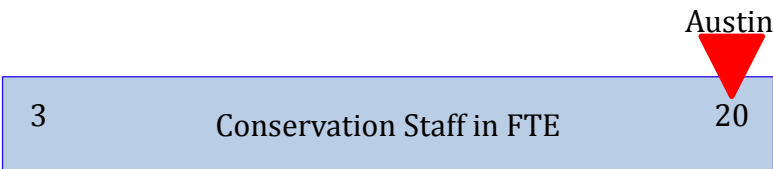
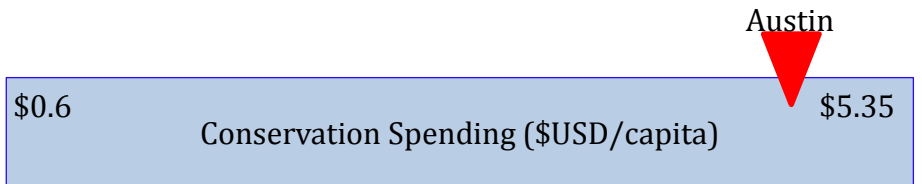
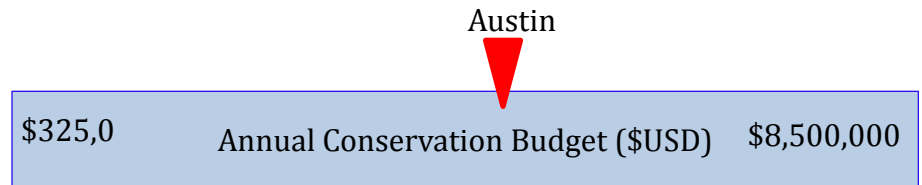
Approximate Population	370,000 - 2.6 million	977,491
Service Area Size (sq. mi.)	181 - over 1 million	555
System Demand (MGD)	61 - 418 (Average: 181 MGD & Median: 119 MGD)	118.5
Recycled Water	0% - 40% (Average 8.7% & Median 4.4%)	2.8%



Range of Survey Participants

City of Austin

Annual Conservation Budget (\$USD)	\$325,000 - \$8,500,000 (Average: \$3.6 million & Median: \$3.2 million)	\$4,375,000
Conservation Spending (\$/capita)	\$0.6 - \$5.35 (Average: \$2.93 & Median: \$3.00)	\$4.48
Conservation Staff in FTE	3 - 20 (Average: 12.3 & Median: 13)	20



WATER CONSERVATION STUDY

Key Finding 2 – Water Savings Goals

All eleven agencies included in the survey have had great success with conservation programs and achieved real water savings. Eight of 11 agencies have a water goal based on a gallons per capita per day (GPCD) reduction. The other 3 agencies have a goal based on a total volume demand reduction provided million gallons per day (MGD).

- Savings goals range: 0.5 – 1.5 % demand reduction per year
- 6 of 11 agencies are currently exceeding their goal
- Austin Water has exceeded their 140 GPCD goal, equates to 1% annual reduction per year. It is recommended they review their goal as part of the Integrated Plan.

Water Saving Partnership, Seattle

- Reduce per capita use from current levels so that the total average annual retail water use is less than 105 MGD from 2013 to 2018, despite forecasted population growth.

Portland Water Bureau

- Maintain residential total use below 63 GPCD.

East Bay Municipal Utility District

- Save 62 MGD through conservation initiatives by 2040. Target in 2015 is 1.2MGD average annual conservation savings.

Irvine Ranch Water District

- Year 2020 GPCD target of 170 GPCD.

Southern Nevada Water Authority

- Goal of 199 gallons per capita per day (GPCD) to be achieved by year 2035.

San Antonio Water System

- Draft pending updated plan approval: By 2070 reduce total GPCD to 88 (+/- 7 for weather variability) and reduce residential GPCD to 55.

Dallas Water Utilities

- Year 2019 goal of 196 GPCD including residential water use of 97 GPCD.

Austin Water

- Reach 140 GPCD by year 2020 and reduce peak demand by 1% each year over 10 years.

City West Water

- Working on new conservation plan now. Total water use reduced to 251 liters per person per day in 2013-14 (67 GPCD).

Water Corporation

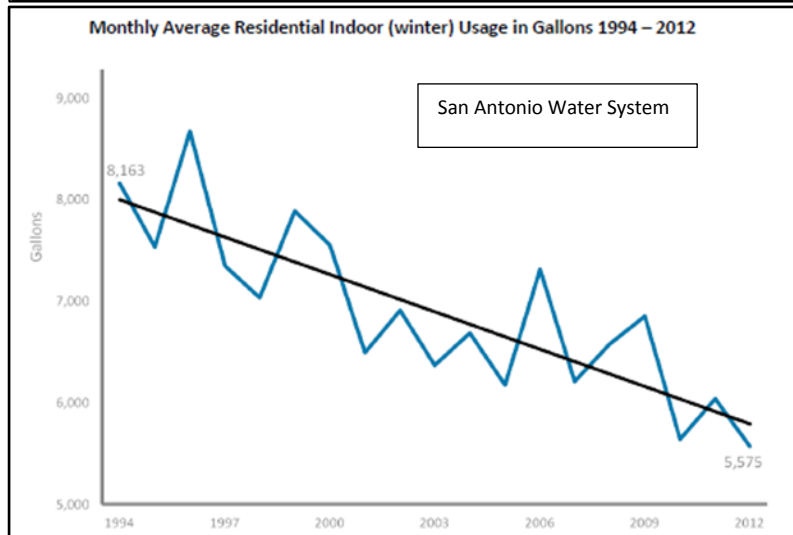
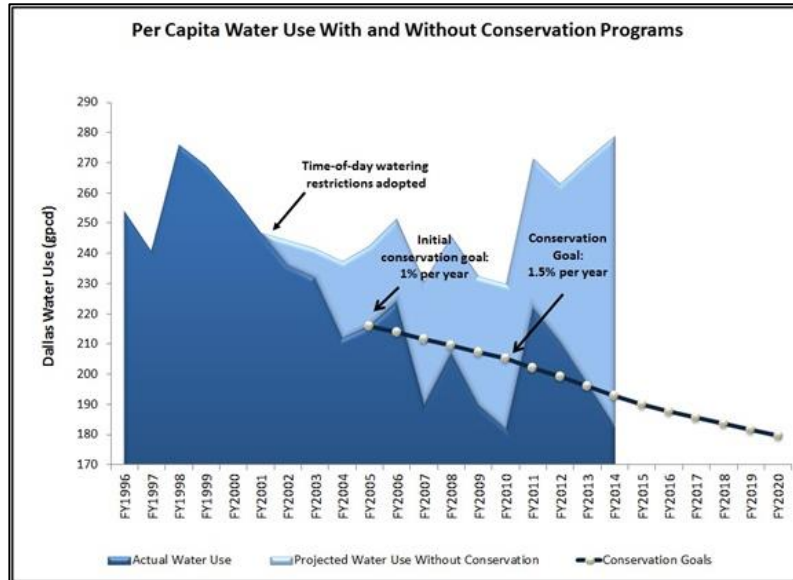
- 15% total demand reduction from 2009 to the year 2030 .

Hunter Water

- Save 4 MGD (4.5 billion liters per year) by year 2034.

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The graphics shown below are from Dallas and San Antonio, respectively, showing their conservation program performance. The participant goals range from approximately 0.5% and 1.0% demand reduction per year.



Key Finding 3 – Successful Conservation Measures

Of the 11 successful water use efficiency programs surveyed, the most common measures are:

- Public and school education
- Residential indoor incentives – clothes washer and toilet
- Commercial indoor incentives – commercial technologies for process water use, cooling towers and water fixtures (toilets, etc.)
- Residential landscape incentives – equipment and promotional campaigns with local nurseries, education and incentives
- Commercial landscape incentives – irrigation equipment and system improvement incentives

Key Finding 4 – Program Funding Source

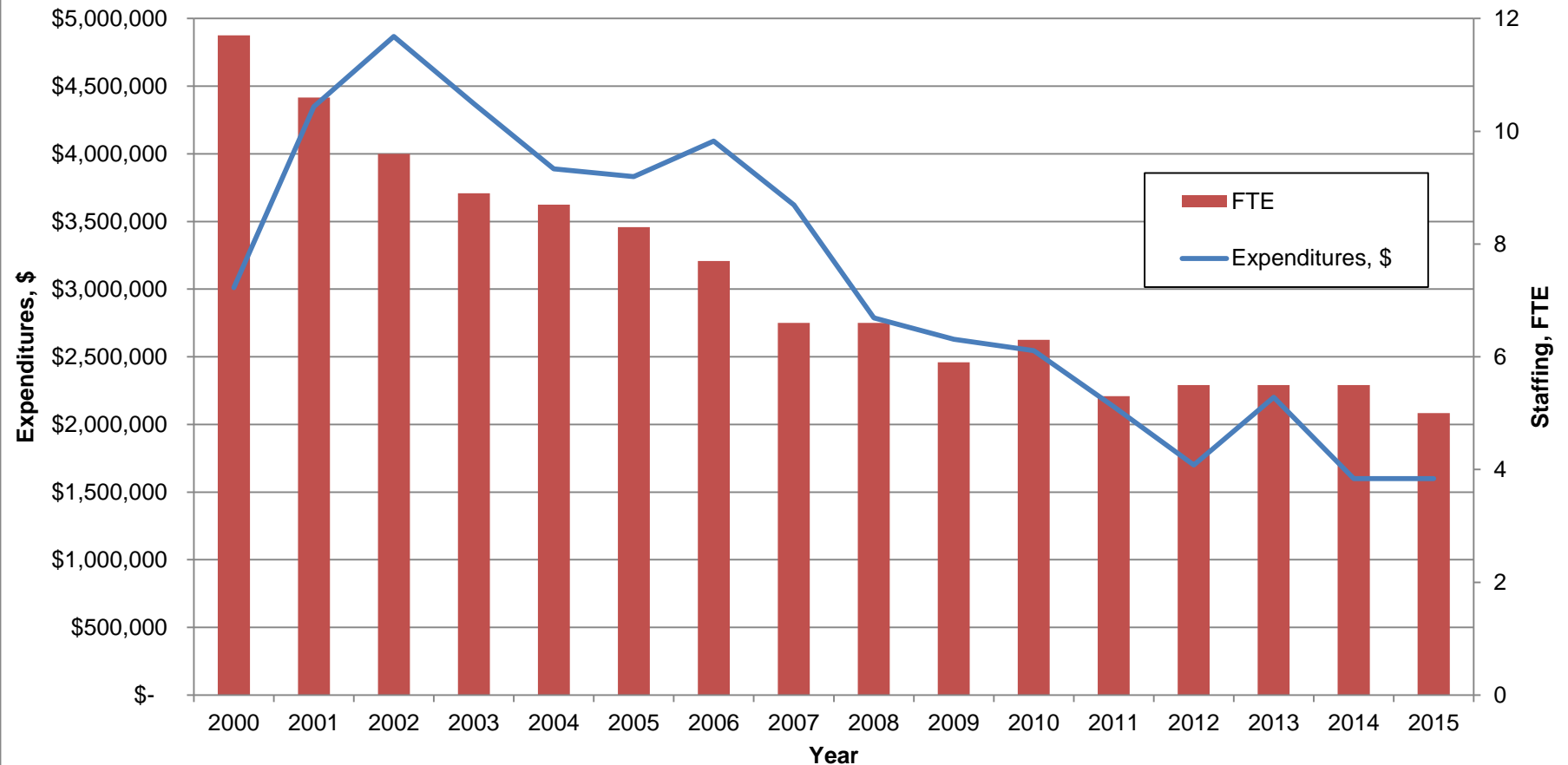
Water charges (rates and/or system connection fees) and **grants** are the **most common source of conservation program funding**. Conservation at a regional level is funded through rates and dues (if applicable). Supplemental funding also comes from state and federal grants. Austin funds their program through rates and grants - similar to most surveyed. Many utilities are looking to more in depth partnerships with businesses on sustainable efforts that extend beyond rebates and case studies.

Key Finding 5 – Costs and Staffing

Costs and staffing levels for conservation programs have varied over time. Annual program expenditures tend to fluctuate depending upon the funds available and age of the measure (the initial startup phase of the program is more expensive than the operation and maintenance of an established mature program). Staffing was also sometimes not consistent if counting enforcement, water loss, and communication staff. Currently 7 out of 11 agencies are experiencing water shortages or are in a declared drought. This has impacted staff levels differently across the participants. Some have increased staff to help with programs and enforcement while others have decreased staff due to the reduction in revenue from lowered water sales. The following figure presents Seattle's Water Savings Partnership's change in funding levels and staff from 2000-2015; because, of their conservation program momentum gained in earlier years, Seattle was able to maintain a successful program with increased water savings, while reducing staff and program expenditures.

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**Water Saving Partnership (Seattle Region Utilities)
Expenditures and Staffing for Regional Water Conservation**



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Business Industry and Government (BIG) Water Conservation

Key Finding 6 –Commercial, Industrial and Institutional Customers (CII)

Austin Water has had a CII program for many years and recognizes there are large savings available with commercial accounts. Austin has past success with semiconductors and universities, but there are always more opportunities. Austin Water was specifically interested in new and innovative ideas related to working with their CII customers. A short summary of key findings and ideas presented by different customer types is provided. Additional details are provided in each individual agency profile presented at the end of the report.

Commercial Customers: Lessons learned

- Communication with commercial management and addressing all written materials to the appropriate person is critical. If a letter is not addressed to the key individual in the organization, the letter will not be read and the customer will likely be non-responsive.
- Rebate or financial incentives values need to be significant to help management with approvals and make an attractive business case based on payback.
- A large challenge is that the application and approval process can take a long time (often a full year from the time the recommended project is identified). Look for ways to design a program that enables easier participation (i.e., less difficult and restrictive application process).

Photo credit: Portland Water Bureau – Business, Industry and Government (BIG) Water Conservation Program (Top Left)

- Target large CII customers by industry (hotels, hospitals, etc.). Spending the time to get to know the largest water-using customers yields the potential for large water savings projects.

Universities and Schools: Possible untapped savings

- Huge savings potential as most universities and schools use lots of water and have not been fully retrofitted. They also have a large number of students, employees, and visitors on site daily using the fixtures.
- Due to the often large size and nature of a campus setting, there is good potential for use of reclaimed water.
- Areas of water savings may include laboratories, cooling and heating, food service, cleaning, leaks, restrooms, athletic facilities and irrigation. Heating and cooling system water efficiency may be achieved with increased number of cycles, automatic controllers, condensate return, and/or reducing makeup and blowdown water.
- Campuses typically have sustainability goals which can work in conjunction with the water utility's goals to save water.
- Universities and schools have the opportunity to educate students, faculty and staff, most who live locally, on the importance of using water wisely – whether they live directly on campus or not.

Semiconductors: Targeted savings

The following list of incentives was provided courtesy of Santa Clara Valley Water District (serves water to Silicon Valley companies in California):

- Circuit boards - recycled water projects
- Reuse of acid waste neutralization water
- Reverse Osmosis (RO) reject for scrubbers
- Reuse of optimization for fume scrubbers
- RO for cooling tower makeup water
- Vacuum pump reclaim and reuse
- Installed closed loop system for circuit boards

Government & City Buildings

- Working with water utility and government buildings to become water efficient is critical before asking customers to be efficient.
- Often government buildings are older, have remaining savings potential, and can be easier to gain approvals for retrofits.

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Save Water & Money. It's as Easy as 1. 2. 3.

Up to 60% of your home's total water usage is used outdoors. Follow these easy ways to reduce your outdoor water use and save the most money on your water bill.



- Soil amendments and soil moisture sensors
- Turf replacement
- Low water use landscaping replacement
- Xeriscape demonstration gardens
- Water waste enforcement
- Watering restrictions (day of week, time of day)
- Irrigation audits/surveys
- Online resources for watering and landscaping, for residential and CII customers and landscape professionals
- Trainings and certification for landscape professionals

Landscape programs can be time consuming and challenging for water utility staff. A common current challenge is how to effectively communicate with customers to understand three key principles:

1. Proper watershed based approach to sustainable landscape design that considers soil type, drainage, and water availability. Consider how the space will be used— play, entertainment, gardening, etc. Plan areas for different amounts of water—hand water, frequent water, occasional water and natural rainfall. Consider the appropriate plant selection - as much as possible, use native or drought-tolerant plants.
2. Smart irrigation equipment: use systems that adjust to the weather.
3. How to use and maintain equipment after installation – many customers never review and adjust the program or system after it is installed and/or when plants are established.



*Photos: Irvine Ranch Water District Landscape Campaign (Top Left)
Southern Nevada Water Authority Water Smart Car Wash Coupon (Top Right)
Dallas Water Utilities Participates in Lawn Whisperer Campaign (Above)*

Key Finding 7 – Outdoor Water Savings

With many utilities' increasingly focused on reducing outdoor water use, there are many creative and new innovative ideas emerging. Austin Water has a comprehensive landscape program. Austin Water currently offers all the listed programs except car wash coupons and training and certification for landscape professionals. A short summary of programs offered by a few of the survey participants is highlighted below.

Water Smart Car Wash Coupons

- Work with car wash vendors to offer a coupon on the water utility website. Popular with both the car wash companies and the customers. Often it is seen in positive light to offer a “coupon”.
- Offer brief multimedia educational video on the program (5-minute video telling facts such as it is 100 gallons to wash a car at home vs. 20 or 30 gallons to wash a car at a recycling car wash facility and more environmentally friendly process) and an interactive map to identify nearby participating car wash locations for ease of use by the customer.

Landscape Rebates and Education for Irrigation Upgrades

- Weather-based irrigation controllers and rain sensors
- High efficiency rotating sprinkler nozzles
- Drip irrigation to replace sprinklers
- Mulch

WATER CONSERVATION STUDY

Key Finding 8 – Alternative Water Sources: Reclaimed Water, Grey Water, Rainwater Capture

This is a rapidly evolving area that is continuing to grow in the industry. A short summary of programs offered is highlighted below.

Reclaimed Water and Non-Potable Reuse: Increasing in popularity

- Reclaimed water has been increasingly focused on in the past few years. New laws and regulations such as Assembly Bill 1406, successfully sponsored by Irvine Ranch Water District in 2007, changed the California Water Code to **allow recycled water to be used for indoor uses such as toilet flushing and cooling towers** in multi-level condominium complexes. The largest challenge in many areas is public sensitivity to the idea of “Toilet to Tap.” Many utilities are working hard on reclaimed water’s public perception to overcome this obstacle.
- In 2013, Irvine Ranch Water District actively supported Assembly Bill 803 sponsored by the California Water Reuse Association and Assembly Bill 2398, which would have enacted the Water Recycling Act of 2012. These two bills expanded the use of recycled water in California by **improving and streamlining the existing regulatory and permitting process for recycled water projects** to reflect current scientific study and advances in treatment technology.

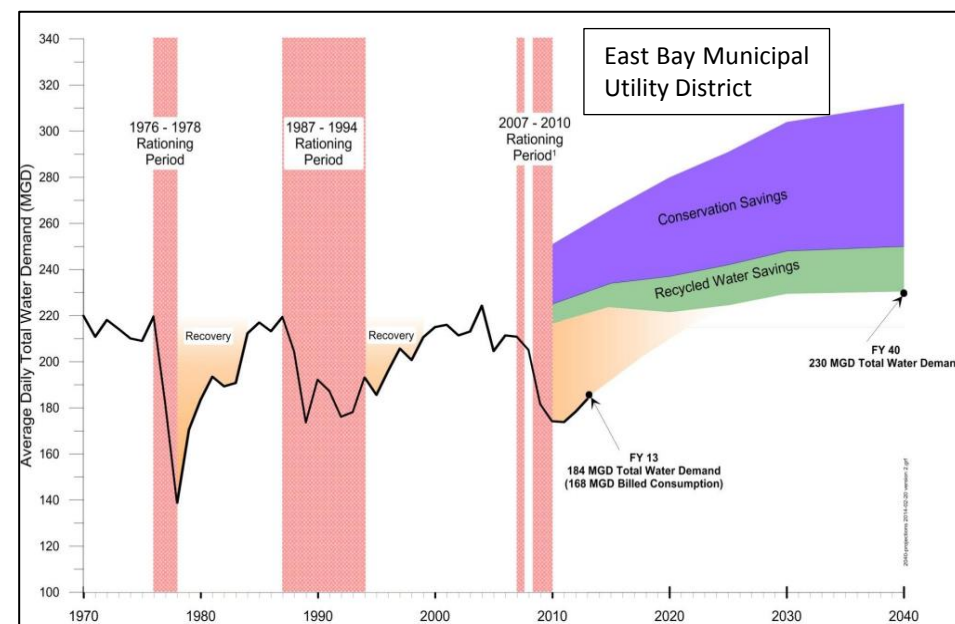
Many agencies are planning for reclaimed water with a combination of onsite systems and water utility treated effluent systems to represent a larger portion of their water supply portfolios in the coming decades. For example, in October 2009, Water Corporation of Western Australia released the 50 year plan “Water Forever: Towards Climate Resilience” representing the culmination of a two-year project dedicated to working with their community to develop a long term plan to deliver water services to Perth, Mandurah and surrounding communities. The plan embodied the principle of becoming more climate resilient and provides a portfolio of options to manage the demand and supply balance by 2030 through:

- Reducing water use by 15%

- Increasing water recycling to 30%
- Developing up to 100 billion liters of new water sources

Water Corporation is currently ahead of schedule to meet this target with annual water use falling from 191,000 liters per person in 2001 to 126,000 liters in 2014. Customers have reduced their water use by 12 percent per person during the last five years. In 2014, Water Corporation recycled 10 billion liters of wastewater in Perth alone. They remain on track to achieve the 2030 target of 30 percent.

For another example, East Bay Municipal Utility District is also planning for recycled water; this is presented in their Water Supply Master Plan and shown below through year 2040 (recycled water savings is shown in the green shaded area). This graphic below also shows a “recovery period” after each drought (in the shaded orange areas). Based on historical data across the U.S., recovery after droughts is typically 7 years.



Photos: East Bay Municipal Utility District - Water Demand Recovery: Demand Projections with Recycled Water and Conservation (Bottom Right) published February 2014

Rainwater Capture: Successful in the proper settings

- Australia has been implementing rainwater catchment on large and small residential and commercial properties for decades. Across Australia, 36 percent of households rely only on rainfall to water

WATER CONSERVATION STUDY

their gardens. Three commercial applications in Australia are provided below:

1. Example from Hunter Water:

A recent study into the role of rainwater tanks in the lower Hunter found that:

- From 2004 to 2013, the number of rainwater tanks in the region increased from around 22,600 to around 38,400.
- Rainwater tanks are estimated to have saved almost 1.2 billion liters of drinking water in 2012/13. This equates to about two per cent of current total drinking water use.
- Over the next 30 years, it is expected that almost 60,000 more rainwater tanks will be installed in the lower Hunter region as a result of the BASIX scheme.
- By 2043, water savings from using rainwater instead of drinking water for suitable purposes are forecast to be around 3.4 billion liters a year, which represents approximately five per cent of the demand for drinking water.
- The amount of drinking water savings achieved by rainwater tanks will normally be less in dry years when there is less rainfall to capture.

2. Example #1 from City West Water:

Opened in February 2010, Medibank Icehouse houses two Olympic-size skating rinks, each 60 meters long and 30 meters wide. With construction taking place at the height of the drought, the building was designed with a range of water efficient features and processes:

- There are two 80,000 liter water tanks that collect rainwater from the 6500 square meter roof.
- Each rink holds 70,000 liters of water frozen as ice, and after metal skates etch and chip the ice away, around 500 liters of water is used to restore the ice to smooth the surface up to 12 times per day.

- Ken McCoy, Facilities Manager at Medibank Icehouse, said that up until recently rainwater was used for toilet flushing and maintenance of the ice: “It’s a fairly large roof and with around 160,000 liters of water storage we’ve found that it’s more than enough to operate the toilets and 6000 liters of water we use each day maintaining the ice.”



3. Example #2 from City West Water:

The new harvesting system has successfully reduced Cadbury Schweppes’ reliance on drinking water by an estimated 7.5 million liters per year. Rainwater is now collected and used primarily for the site’s cooling towers. It can also be used in toilets and for irrigating garden beds when available.

• Rainwater Challenges:

- Rainwater capture is challenging to make cost effective on a small scale, especially in places that don’t get year round precipitation. It works in places that have hot summers and large irrigation needs. In Texas there is limited summer rainfall when the high temperatures and irrigation needs are at their peak.
- There can be an additional educational benefit to rainwater collection as the customer has the opportunity to observe the volume of water obtained from rain and amount used on irrigation. The value of this awareness is difficult to quantify.
- Ongoing and regular maintenance of rainwater systems can be a challenge, especially for residential customers.

Photos: City West Water - Medibank IceHouse in Melbourne Australia uses water from rain capture from two tanks on roof for resurfacing the ice. (Middle Right)

WATER CONSERVATION STUDY

- On a large scale, there have been successful programs with very large above-ground tanks or water collection basins under football fields at schools such as San Francisco State or the 49ers stadium.
- Many water utilities are offering incentives and education for rain water capture including Austin Water. Austin offers homeowners and schools a WaterWise Rainscape Rebate of up to \$500.

Grey Water: Not very popular at this time

- When grey water is offered the uptake has not been very significant. Only 4 of the 11 agencies offer this program. For now, it is not a very popular program due to the cost of the engineering of the system and the ongoing maintenance required on a small scale. This can work in a larger setting such as commercial facilities. However, popularity of this program rises during drought watering restrictions.

Key Finding 9 – Rebates and Incentives

In general offering rebates and financial incentives remain a popular method for encouraging water conservation for water agency customers.

Review Market Saturation:

- Many agencies are assessing the saturation of fixtures and devices to decide whether or not to continue implementing their long standing incentive measures - especially residential toilets and clothes washers. This is largely a result of higher efficiency fixtures now being required through state and federal mandates as in plumbing, building or energy codes.
- Many water agency funds previously dedicated to residential plumbing incentives for toilets and clothes washers are being shifted to focus on landscape irrigation, indoor commercial, industrial and institutional customers.

Key Finding 10 – Leakage Management: Pressure, Testing, Replacement, Leak Fixes, Automated Metering Infrastructure (AMI)

Water loss reduction is a key area of focus for many water utilities.

- All 11 survey participants are doing some form of leak management. Those with higher percentages of water loss are more proactive with their programs (actively looking for leaks).

Those with lower percentages of water loss (more efficient) are conducting a more “reactive” program where they fix leaks only when they are reported.

- The use of the International Water Association/American Water Works Association Manual M36 Water Loss Software method has become increasingly popular. Water loss reduction has been a trend across the U.S. to make sure non-revenue water is reduced. The key is to make sure that the input data is of good quality and carefully reviewed.
- Meters continue to have problems with maintaining accuracy and many utilities are increasing their frequency of testing and replacement to improve the quality and reliability of water meter production and customer meters.
- The use of Automatic Metering Infrastructure (AMI) is becoming more popular as a way improve water system efficiency at the customer and system levels. Smart meters collect water use data from water meters at regular intervals and send the information to the Water Corporation. The technology was trailed in Kalgoorlie-Boulder where there are now 13,800 smart meters installed at properties. Over 14,000 smart meters have been installed at properties throughout the Pilbara region. Customers with a smart meter can view their hourly water use in My Water, the Water Corporation’s self-service website. These customers also receive an email if a continuous flow is detected at their property, helping them to fix leaks straight away, saving water and money.
- The high cost of such systems and changing technology has slowed implementation but these systems have a lot of promise. Austin is interested in AMI and exploring funding.



*Photos: East Bay Municipal Utility District: Interface from AMI pilot project
Portland Water Bureau: is running a pilot project with 34 customers which is planned to be completed at the end of 2015. (Above)*

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Key Finding 11 – Building Codes

A lot of water utilities have new state building codes for new construction. Austin Water, as well as other water utilities, have been capitalizing on the water use requirements (and local ordinances) for new developments and/or remodel projects.

New Development Codes and Ordinances:

- Most utilities, including Austin Water, have some form of mandatory ordinances or local amendments to the building codes for new development construction. In recent years, these ordinances have been increasing in both number and elements required.
- The checklist example provided shows how some water utilities are including landscape requirements. The EBMUD check list provides a percentage of irrigated area of landscaping, total percent allowed for turf and non-turf areas, automatic irrigation controls, covers for pools and spas, and spray head location limitations.
- Compiling new requirements into an organized 1 page “checklist format” has made it easier for business developers to use.
- Some areas are now focusing on trying to require “water neutral” development, meaning the development has installed as many efficient devices as well as paid an offset “credit” to the water utility to save water in other locations in the service area, thereby achieving a “net zero” additional water use for the development.
- Many utilities also have checklists as part of their “Green Buildings Program”.
 - The Building and Sustainability Index (BASIX) is a planning policy that applies to all new homes and major alterations in New South Wales, Australia (see information for Hunter Water) to reduce water and energy use. Homes can meet BASIX requirements by installing water-efficient appliances and installing a rainwater tank or connecting to a supply of recycled water.



Water Service Regulations - Section 31 Water Efficiency Requirements Checklist

TO BE COMPLETED BY APPLICANT					
I certify the subject project meets the specified water-efficiency requirements for plumbing and landscaping.					
Signature _____			Date _____		
CUSTOMER ACCOUNT INFORMATION					
Applicant Name (print)		Contact		Phone #	
Site Address					
Average Sq. Footage	# of Units	# of Fixtures	# of Meters		
<input type="checkbox"/> Single Family <input type="checkbox"/> Multi-Family <input type="checkbox"/> Commercial <input type="checkbox"/> Institutional <input type="checkbox"/> Irrigation only <input type="checkbox"/> Industrial <input type="checkbox"/> Other:					
Indoor Water Use	Requirements (the more restrictive of all state, federal and EBMUD Codes apply)	No. Devices and Value	Unit Meas.	Pass/Fail	DISTRICT USE ONLY
Attach Site Plan, Equipment List (see definitions on reverse side)					
Toilets	≤ 1.28 gal/flush; > 350 gram rated		Flow Rate		<input type="checkbox"/> Check List (no plan required) <input type="checkbox"/> Check List w/ required plan check review
Urinals	≤ 0.5 gal/flush		Flow Rate		AUDITOR:
Showerheads	≤ 2.0 gpm; one per 2,500 in. ²		Flow Rate		DATE REVIEWED:
Kitchen Faucets	≤ 2.2 gpm		Flow Rate		<input type="checkbox"/> Follow-Up Required (Explain):
Bath Faucets	≤ 0.5 gpm; ≤ 1.5 gpm		Flow Rate		DATE RE-SUBMITTED:
Clothes washers	≤ 4.5 Water Factor or ≤ 4.5 gallons per cu. ft. capacity		Water Factor		DATE APPROVED:
Dishwashers	Standard ≤ 5.0 gallons Compact ≤ 3.5 gallons		Cycle		Meter Sizing:
Pre-rinse spray valves	≤ 1.6 gpm		Flow Rate		Dedicated Irrigation Meter Required <input type="checkbox"/> Yes <input type="checkbox"/> No
Cooling towers	≥ 5 Cycles of concentration		Cycles		MATERIAL DISTRIBUTED
Food Steamers	Boiler-less, self-contained				<input type="checkbox"/> Water Service Application <input type="checkbox"/> Section 31 Regulations
Ice machines	Air-cooled or ≤ 25 gallons/100 lbs.		Air-cooled Wtr-cooled		<input type="checkbox"/> Plant List <input type="checkbox"/> Residential Washer List
Commercial Refrigeration	Air-cooled or water-cooled w/closed system; no single pass permitted.		Air-cooled Wtr-cooled		<input type="checkbox"/> Toilet List <input type="checkbox"/> Commercial Washer List
Vehicle Wash Facilities	≥ 50 % recycled		% recycled		RECOMMENDED MEASURES
					<input type="checkbox"/> Drip Irrigation <input type="checkbox"/> Plant Palette
					<input type="checkbox"/> Self-adj. Controller <input type="checkbox"/> Mulching
					<input type="checkbox"/> Soil Amendment <input type="checkbox"/> Other:
					COMMENTS:
Outdoor Water Use	Requirements (the more restrictive of all state, federal and EBMUD Codes apply)	No. Devices and Value	Unit Measure	Pass/Fail	
Attach Landscape Plans. (see definitions on reverse side)					
Total Landscape Area			sq. ft.		
Total Irrigated Area			sq. ft.		
Total Turf Area	< 25% of irrigated		sq. ft. & %		
Non-Turf Areas	70% native or low water use		sq. ft. & %		
Automatic Self Adjusting irrigation controller	For all commercial and 3 or more residential > 5000 ft ² landscaping		Manufacturer Model #		
Irrigation Efficiency	80% ET _o - Reference evapotranspiration; no overspray, no runoff		% ET _o		
Valves and Circuits	Group plants by type/hydrozones		# of Zones		
Pool and Spas	Covers Required		#		
Sprayheads	Not allowed in < 8 ft. wide area		See Regulations		

Photos: East Bay Municipal Utility District – Water Service Regulations – Water Efficiency Requirements Checklist (Above)

WATER CONSERVATION STUDY



Key Finding 12 – Communication with Customers

Communication with customers to increase their awareness, knowledge, and respect for water has been and will continue to be a main focus for water utilities.

Communication through Pricing and Rates

- Historically water has been very inexpensive (when compared to other resources such as energy) in both the United States and Australia. This has unfortunately led many customers to overuse and waste the resource without huge financial burdens.
- There has been work done on trying to communicate the value of water but most survey participants agree that the cost of water needs to increase or be priced differently for things to change on a significant scale. Recently, in California, the legality of using some forms of inclining block rates to drive down water use has been challenged. Irvine Ranch Water District's allocation-based conservation rate structure offers property-specific water budgets and tiered pricing to provide customers with economic incentives for efficient water use.

Communication Messaging through New Methods, Including Social Media

- Lots of attention is devoted to methods of communication with customers. More traditionally this has been in the form of: websites, newsletters, mass e-mails, and bill inserts. More recently water utilities are turning to social media such as Facebook, Twitter, video applications and platforms, and targeted letters and e-mails.

There is still a large amount of research being conducted on the most effective way to communicate water conservation messages to and with customers. There are many lessons learned being provided by energy utilities on how to implement effective marketing campaigns with customers.

- Austin Water launched a pilot study of a new mobile application platform designed to help customers better understand and manage their water use. This was one of the strategies recommended by the Austin Water Resources Planning Task Force. Austin Water has contracted with Dropcountr, Inc., to provide 10,000 residential customers with free home water use reports.

Communication Messaging during Normal, Drought and Post-Drought

- The traditional means of communication with customers has been to encourage wise use of water in normal times. In water shortages more drastic cutbacks are needed until the drought ends. Many survey participants are thinking about how to keep and maintain restrictions or water efficient practices even after the water shortage is declared over.
- As of August 2015, 7 of the 11 survey participants are experiencing lower than water levels or are in a declared drought.
 - The question during a drought is how to communicate the need for customers to cut back and what actions they can take.
 - After the drought, the question often becomes how the utility can communicate with customers and create efficient practices such that water efficient practices are maintained. Many utilities learned that after a drought it is important to communicate the need to be resource efficient such that people do not return to "business as usual" and return to inefficient practices. In Perth Australia they have a plan to 2060 named "Water Forever Whatever the Weather" which has helped to communicate the need for water conservation and resource efficiency independent of the current weather patterns.

*Photo: City of Austin – In May 2015, Austin Water is trying out new mobile app to provide customers with home water use reports. (Top Left)
Water Corporation – Water bills are provided to customers online. (Top Right)*

WATER CONSERVATION STUDY

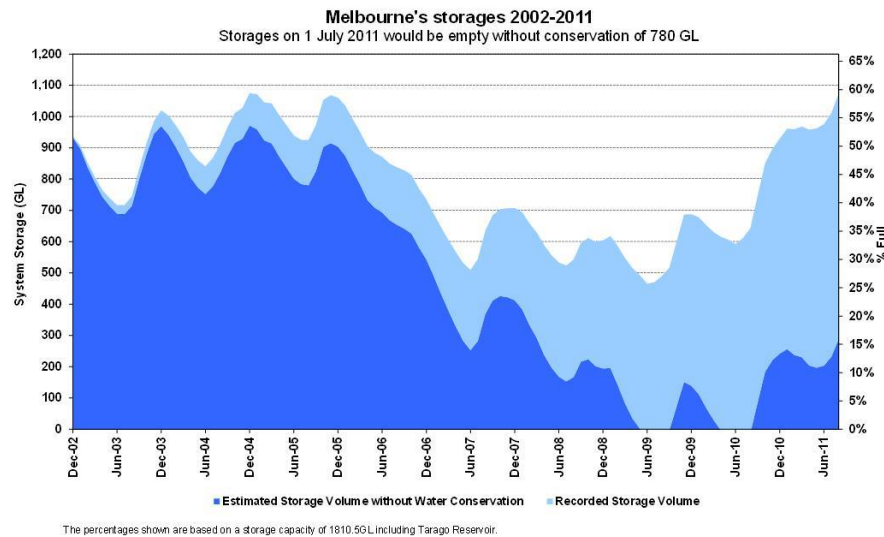
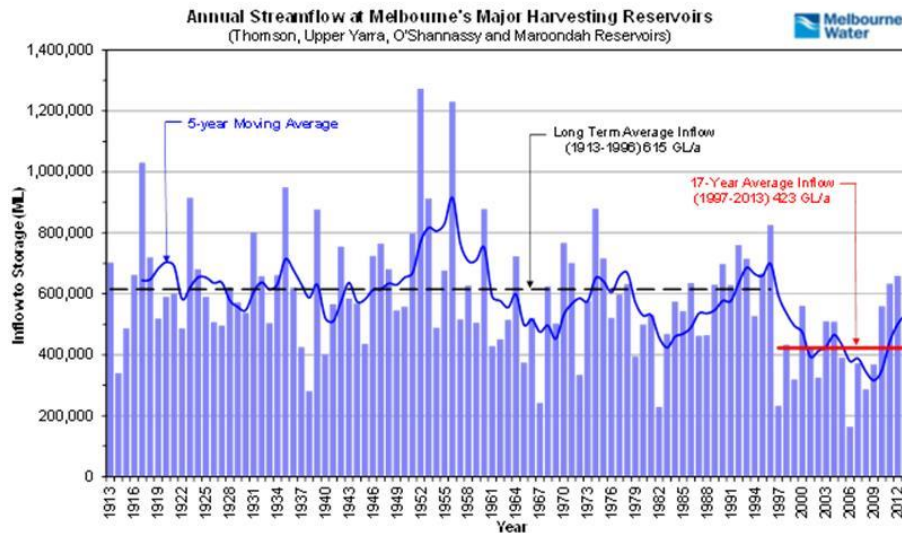
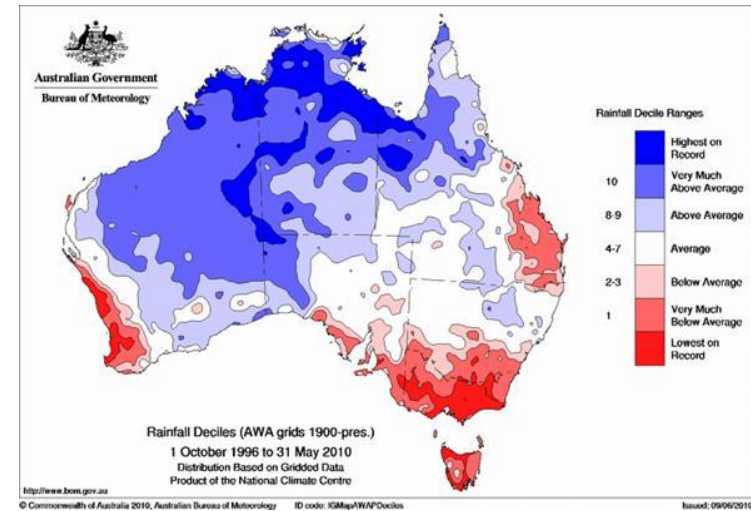


Photo: (Above) City West Water, Yarra Valley Water and South East Water in (all three agencies supplied by Melbourne Water) Australia estimated 785,000 ML or 636,400 acre-feet of volume conserved in storage between November 2002 and July 2011. Without the water conservation the reservoir would have been empty.

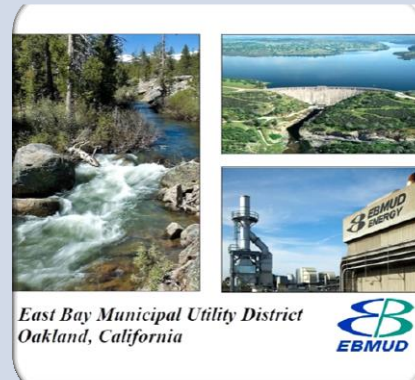


Communication Messaging during Normal, Drought and Post-Drought (Continued)

- 14 years lowest recorded streamflow
- 3 significant El-Nino events 1997/98, 2002/03, 2006/07
- 2006 streamflow - 30% lower than previous lowest
- Streamflow to 2010 - 37% lower than Long Term average
- Drought contributed to range of other system impacts
- In 2012, City West Water made drought restrictions permanent.



WATER CONSERVATION STUDY



Program Highlight:

Water Smart Technology flexible program for CII rebates. The program allows custom equipment replacements up to 50% of project installation cost. This is for projects that are not the standard kitchen, restroom, cooling tower, medical equipment rebates.

Program Highlight:

The BIG (Business, Industry and Govt) program offers custom incentives for customers - currently 50% of funding provided with projects that will have a year or more payback, up to \$5,000.

Program Highlight:

AMI pilot projects and home water use reports to residential customers. Evaluation and quantification of savings when customers provided information about their water use and compared to similar peers using social norms.

Program Highlight:

"Brown is the New Green Landscape Makeover" contest to win a drought-tolerant landscape worth \$6,000.

WATER CONSERVATION STUDY



Program Highlight:
The Water Efficient Technologies Program has saved businesses over 1.3 billion gallons of water.



Program Highlight:
WaterSaver Landscape Coupon program simplifies water-wise landscaping by encouraging SAWS residential water customers to replace parts of their traditional lawns with garden beds made up of hardy, drought-tolerant plants.

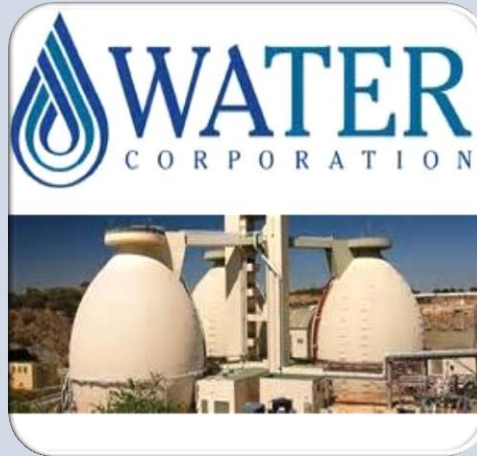
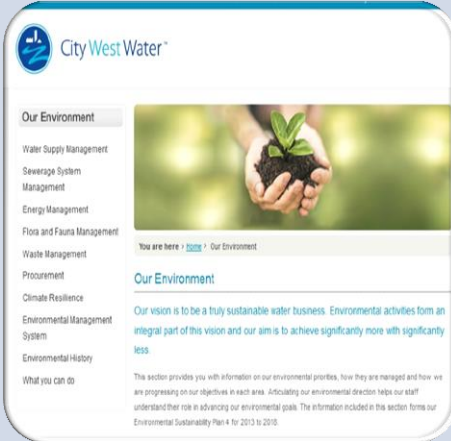


Program Highlight:
Offer free CII water surveys and also a CII Water Efficiency Rebate offers up to \$100,000. Also have free Irrigation System Check-ups, new "Throne for Your Home" toilet replacement program.



Program Highlight:
"Dropcountr" is the new home water use reporting software pilot project. Large number of CII and landscape programs including compost and mulch rebates.

WATER CONSERVATION STUDY



Program Highlight:

The Victorian Government has committed \$40 million to the program. "Living Victoria Water Rebate Program" provides incentives to reduce operating costs and water consumption by installing water efficient products.

Program Highlight:

Data loggers have saved high water using customers a total of over 0.24 MG since the program commenced in 2012. "WaterWise Towns" are offered free products and installation of tap aerators, showerheads, dual flush toilets, leak repair, and irrigation controllers.

Program Highlight:

Business water audit programs have saved almost 2 billion liters of water since starting in 2010. Currently researching and evaluating water savings from rainwater tanks.

WATER CONSERVATION STUDY

SUGGESTIONS FROM SURVEY PARTICIPANTS

From their recent conservation program implementation, survey participants offered the following experiences and learned lessons. The quotes were taken directly from participants and are listed here unmodified in order to retain the information in the original context:

- “Make sure the program elements match the service area. Know your customers and try to create programs that reflect their needs and your climate / economy. Regular surveys of your customers are a great way to keep in communication in order to know what is needed and make successful conservation programs.”
- “Cost effectiveness is no longer the primary driver of water programs. The key driver is water savings. It is important of course to look at the cost, but in the end the program goal should be to save water in the best way possible for the service area.”
- “Identify and target large water savings opportunities. Rather than focusing efforts on designing programs to appeal to the most customers, target programs for large water saving opportunities, even if only a few customers are involved.”
- “Put case studies on the utility website. It is important to praise your customers for their positive efforts. Everyone loves to get recognized for a job well done and it motivates others when they see their peers’ savings. It is the use of social norms that is very effective.”
- “Use social network and marketing to keep costs down; it helps to encourage two way conversations with your customers.”
- “Working with commercial customers can be tricky but can yield big savings when the successful implementation of a large project occurs. It takes knowledge and patience.” Note: One agency’s program is being revised to make it easier to work with the customers and gain access to funds. They have set up a program but have not been utilizing all the available money since it’s been too complicated for the customer to participate (i.e., it takes too long from program recommendation to the actual implementation of the project).
- “Work together in the region. Leverage programs with other water utilities, particularly the energy utilities and wastewater agencies.

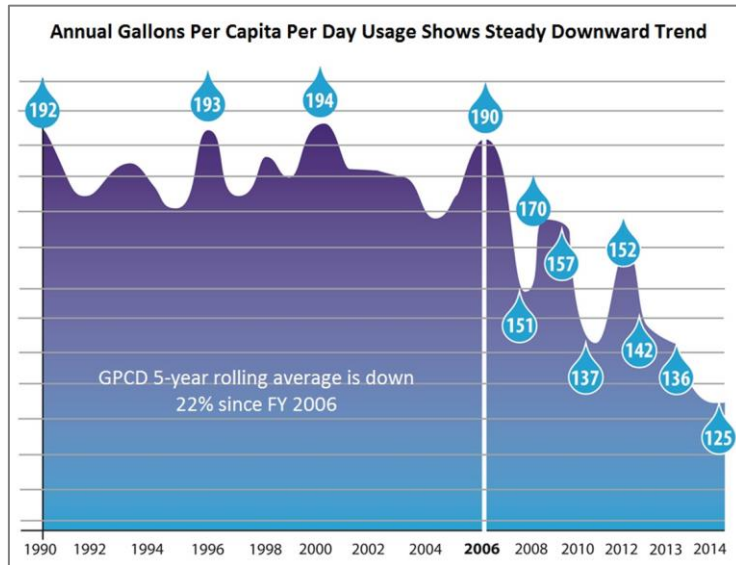
Consistent and organized communication and programs tend to do the best with customer reception and are the best financial deals with customer funded programs.”

- “A slow and steady consistent conservation program is wise. It is hard for the customers to start and stop programs due to lack of funding. Doing best management practices and utilizing the best available technology is a long term effort, not a reaction to lack of precipitation.”
- “Buy in is critical. It is really important to engage all levels of decision makers and interested parties: General Managers, Conservation Program Managers, Water Conservation Coordinators and staff, and the public. As the public becomes more involved, open communication is becoming more of a high priority.”
- “Addressing land use regulation and enforcement is vital to long term water use efficiency. For example, it’s not a good idea to allow installation of brand new turf and at the same time have rebate programs to pay for turf removal.”
- “Fund innovation of new technologies and research evaluations. To lead by example it is important to know what’s working and understand the savings potential.”
- “We have the challenge of having a customer base that is diverse socioeconomically and therefore also in water use patterns. The more we evaluate programs the more we realize that success in cost effective water reductions hinges on appropriately identifying and engaging the target audience specific to each program. My mantra is ‘the right program for the right customer.’”

WATER CONSERVATION STUDY

PRELIMINARY RECOMMENDATIONS

For decades Austin Water has done a good job establishing themselves as a leader in water efficiency programs. Based on this survey, and other recent ones completed by Maddaus Water Management, we recommend that Austin Water consider some of the information in the report as part of their water efficiency program review in 2016 during the creation of their Integrated Water Resources Plan.



The following items could be considered by Austin Water:

1. Pursue Advanced Metering Infrastructure.
2. Consider keeping permanent outdoor water restrictions 1x day week.
3. Encourage living buildings (Green buildings with net zero water use <http://living-future.org/lbc>) and advanced buildings with dual plumbing, onsite water treatment, etc.
4. Increase customer engagement, 1-1, surveys, etc.
5. Commercial: Improve marketing, expand outreach, and use electronic forms to make process easier to encourage more participation.

- Continue fostering relationships w/businesses and publish case studies
 - Continue working w/semiconductors, Univ. Texas, and government buildings
 - Consider targeting commercial customers with a focus on a particular industry at a time, for example the hospitality industry. Consider a partnership between Office of Sustainability, Austin Water and Austin Energy to work together on projects, such as the hospitality industry, to create more of a holistic approach, which can create more options of combined resources and momentum between the groups behind the initiative. Once the hospitality industry program is well established or saturated move onto other industries.
6. Create relationships beyond traditional energy, water, and sewer. Expand outreach network to community groups and organizations.
 7. Focus on large scale rainwater capture, commercial and residential.
 8. Increase recycled water (purple pipe) connections.
 9. Increase marketing and engagement with largest water users. Conduct large projects with effective incentives and advancements, and save large amounts of water.
 10. Try coupon programs, such as car wash or purchasing efficient plants.
 11. Advance use of alternative sources and on-site systems.
 12. Add more photos to website and multimedia for customer appeal.
 13. As part of the Integrated Planning process: review saving goals, funding and staffing levels, and consider alternative sources as part of the supply portfolio.

WATER CONSERVATION STUDY



Water Use Efficiency Strategies:

According to the 2013 to 2018 Regional Water Conservation Strategies and Actions, the following nine customer water use efficiency strategies will be implemented and will complement other utility conservation actions (rates, codes, and system operations):

1. Promote water efficiency among residential, commercial, institutional customers in a fair and cost effective manner using education, training, partnerships, and financial incentives.
2. Increase youth participation in conservation education by assessing and expanding upon what's working well in school districts regionally.
3. Conduct outreach providing materials and information on leak identification and repair, including multi-language "how-to" videos.
4. Provide information and low cost giveaway items for community events, festivals, and customer service counters.
5. Explore new options to improve conservation communications, especially with non-English speaking customers.
6. Create a seasonal on-line conservation message repository for utility newsletters and other communications.
7. Promote changes in behavior that will lead to more water-efficient practices.
8. Monitor and encourage a customer ethic that values water conservation.
9. Comply with State Water Use Efficiency Rule.

2014 Program Activities

PROGRAM	ACTIVITY LEVEL
Youth Education	
Classroom Presentations	270 presentations / 6,800 students
Community Outreach	
Festivals and Events	12 festivals / 8,600 festival attendees
Residential Landscape Education	
Savvy Gardener Classes	14 classes / 300 attendees
Garden Hotline	1,100 water efficiency questions 13,450 soil, lawn and plant questions (many relevant to water efficiency)
Natural Yard Care Guides and Fact Sheets	9,090 brochures distributed
Residential Toilets	
Multifamily WaterSense Toilets	35 buildings / 329 toilets
Multifamily Premium WaterSense Toilets	27 buildings / 777 toilets
Single Family WaterSense Toilets	404 homes / 404 toilets
Single Family Premium WaterSense Toilets	87 homes / 96 toilets
Commercial Equipment	
Kitchen Measures	26 projects
Restroom Measures	23 projects / 765 fixtures
Custom Projects	2 projects
Cooling / Refrigeration / Ice	1 project
Cool Tunes (Cooling Tower Incentive)	4 projects completed / 7 ongoing participants
Irrigation Projects	
Landscape Irrigation	8 projects
Landscape Professionals Trainings	
Regional Collaboration (Local Hazardous Waste Management Green Gardening Program)	17 trainings / 590 attendees

Supporting Elements

For Customers

- Technical assistance to residential and commercial customers on irrigation efficiency issues.
- Technical assistance to commercial customers on indoor efficiency issues.
- Regional website www.savingwater.org.
- Regional hotline 206-684-SAVE.
- Regional Language Line, offering language interpretation by phone.
- Take-home items including toilet leak detection kits and hose washers.

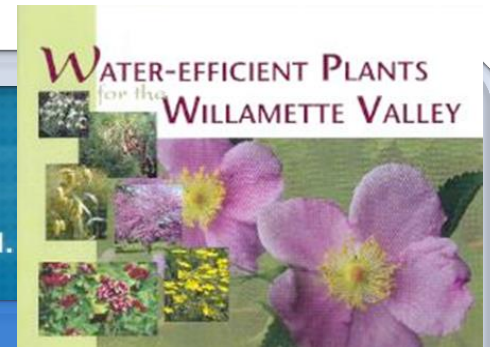
For Partner Utilities

- Seasonal message repository for use in utility newsletters and other communications.
- Support for Water Use Efficiency Rule reporting.
- Saving Water Partnership annual report.
- Messaging on water conservation benefits for salmon, in fulfillment of resource agency and tribal agreements.



Portland Water Bureau

From forest to faucet, we deliver the best drinking water in the world.



Key Water Efficiency Programs:

Technical Assistance: On-site assessments provided to CII customers, phone and email technical assistance, including consumption histories, provided to all customers, pilot-testing of advanced meter analytics to provide customers real-time usage information (one of goals of pilot), and updated list of WaterSense certified landscape professionals on web.

Information and Education through community events, public presentations and workshops, youth education assemblies, sponsorship of Childrens Clean Water Festival and Outdoor School, web-based information, blogs, low-water use residential demonstration garden in NE Portland, and media outreach in partnership with the Consortium.

Incentives and Rebates: 3-year project with Portland Public Schools, \$15,000 annually, to change-out all single-pass cooling and update fixtures.

Business, Industry, and Government (BIG) Incentive Program offered primarily to small businesses and non-profits to assist with making changes to technologies to use less water. Various businesses have been assisted during the past 3+ years, primarily restaurants changing from water-cooled to air-cooled ice machines. Other projects including commercial laundry and a water-reuse project at a metal cutting company have been funded.

Lessons learned: It's hard to give away money, even when 75% of the costs up to \$5,000 were covered. Current program is 50% up to \$5,000. Some customers are very excited and get applications in promptly. Since there is a contract involved, there is a lot of back and forth with contracting and city attorney staff, so the incentive can take a while to receive. Considering doing incentives for special projects and rebates for ice machines and condensers since they wouldn't require so much processing to approve. Some customers are excited but then never respond. BIG staff will follow up no more than 3 times before they are filed away. Patience is definitely needed by both BIG staff and customers for this process.



Key Water Efficiency Programs:

Residential Rebates: Magic of Mulch, high-efficiency toilets, high-efficiency clothes washers, lawn conversion & irrigation upgrades, multi-family submeter retrofits, greywater, surveys

CII rebates: toilet, clothes washers, lawn conversion and irrigation upgrade, irrigation rebates and services, customized rebates, pre-rinse spray nozzles, water broom program, surveys

Landscape Rebates: cash for grass, greywater rebates, community garden grants

Free: showerheads, kitchen faucet aerators, bathroom faucet aerators, hose onzzle, dye tablets, shower diverter, and pre-rinse spray nozzle (CII only). Restaurants, hotels, and other businesses are encouraged to remind customers to conserve with free linen change cards, shower clings, dining table cards, etc.

East Bay Municipal Utility District's "My Water Report Program" provides tailored water conservation tips and information including links to related rebates to help single-family residents better understand water use and target efforts to save.



WATER CONSERVATION STUDY



Key Water Efficiency Programs:

RightScape Program features the Right Plants, Right Equipment & Right Schedule to educate customers on outdoor water efficiency. As part of drought response Irvine Ranch Water District added a "Brown is the New Green" campaign to encourage customers to let their lawns go brown. Another component of "Brown is the New Green" is a Landscape Makeover contest for customers to win a drought-tolerant landscape makeover valued up to \$6,000. The RightScape Contest will award the makeover to customers who save the most water during the summer months compared with their usage for the same months last year.

Irvine Ranch Water District uses an **allocation-based conservation rate structure** which offers property-specific water budgets and tiered pricing to provide customers with economic incentives for efficient water use. Customized and equitable water allocations are established for each customer account based on a variety of factors including: irrigated area, daily weather data and number of residents, or business type. Customers who use water within their allocation purchase water in the lower tiers and enjoy very low water bills. Customers who use water in excess of their allocation receive a strong pricing signal indicating excessive or wasteful use. IRWD's monthly water rates have two components: a commodity rate set to recapture the variable cost of imported water and local groundwater, and a service charge set to recover the fixed costs of maintaining the water distribution system. This allows IRWD to provide exceptional service while also encouraging efficient water use and providing for rate stability. The monthly water charges for a typical residential customer are among the lowest in Orange County.



SOUTHERN NEVADA WATER AUTHORITY

A NOT-FOR-PROFIT WATER AGENCY

CONSERVATION

COUPONS & REBATES

LANDSCAPES

Key Water Efficiency Programs:

Southern Nevadans adopted a number of water conservation measures, including watering restrictions and landscape restrictions, to reduce community water use.

Water Smart Landscape Rebate Program: 174 million square feet of grass removed, 88 billion gallons of water saved since the program began in 1999.

Pool Cover Instant Rebate Coupon Program: 37,000 coupons distributed, 460 million gallons of water saved annually.

Water Efficient Technologies Program: 1.3 billion gallons of annual water savings by businesses

Water Smart Homes: More than 10,000 homes have been built via this program, 900 million gallons of water saved per year.

Conservation Program Highlight: Permanent limitations on new landscape development including front-yard turf prohibition and limitations on backyard as well as CII turf prohibited and MF reduced. These were put in because new development were 28:1 versus new homes to conversion homes (from 2000-2003). Urban Planners - sprawl effects, lot sizes, etc. Reliability provide new surface water or groundwater for population planned. 75 years for life of new development.

WATER CONSERVATION STUDY



Key Water Efficiency Lessons:

San Antonio Water System's Commercial Custom Rebate program offers rebates to commercial customers who institute new water-saving processes or install new water-saving equipment. The rebate amount is determined by the permanent water savings the project can achieve. Staff works with the site to determine the life of the equipment, the installation cost and the return on investment. If water savings are confirmed, businesses may receive a rebate up to 100 percent of installed water-saving equipment. Often, when water consumption is reduced, productivity may actually increase.

Plumbers to People provides potable water leak repairs by plumbers to households qualified at no more than 125% of federal poverty guidelines.

Conservation Make Over is an "invitation only" program that proactively finds low-income households that may benefit from limited plumbing assistance to repair leaks. Since a key challenge is the possibility of visited homes having no leaks, recently revised effort include partnering with non-profits that service the target population. These organizations obtain key information such as number of adults and children in the home which SAWS, using their residential end-use study, uses to assess if the indoor usage is higher than is expected.

WaterSaver Landscape Coupon

The application deadline for the spring package expired June 30. Please check back in Sept. for a new opportunity to apply for a WaterSaver Landscape Coupon package.

Using a plant-by-numbers approach, the WaterSaver Landscape Coupon program simplifies water-wise landscaping by encouraging SAWS residential water customers to replace parts of their traditional lawns with garden beds made up of hardy, drought-tolerant plants.

The plant package includes 27 drought-tolerant plants and suggested bed designs. The coupon is intended to cover only a portion of the plant package cost.*

How it Works – In 4 Easy Steps!

-  **1 Remove** 200 square feet of grass per coupon (2 maximum).
-  **2 Apply** for \$100 coupon online or mail in a paper application.
-  **3 Shop** for plants at participating nurseries.
-  **4 Plant** & mulch your new WaterSaver garden bed!

WATER CONSERVATION STUDY



Key Water Efficiency Programs

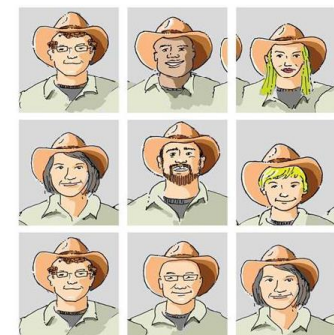
Incentives For Commercial and Industrial, Institutional (CII) customers:

The City of Dallas Water Conservation Program offers up to \$100,000 in site-specific rebates to CII customers towards the cost of new equipment and processes that conserve water at existing facilities. No minimum amount to apply. Applications are processed on a first-come, first-served basis. A free City of Dallas water efficiency facility assessment is required for eligibility. Free Assessments will include a full examination of:

- Cooling Towers, Boilers & Other Thermodynamic Operations
- Metering, Monitoring and Measurement
- Plumbing Fixtures, Fittings & Equipment
- Landscape Irrigation
- Food Service Operations
- Laundry Operations
- Laboratory & Medical Facilities
- Swimming Pools, Spas & Fountains
- Vehicle Washes
- Alternate Sources of Water

2014 Regional Campaign Theme

- **Team Lawn Whisperer**
 - Campaign will
 - Reinforce “maximum twice weekly or less” watering message
 - Demonstrate how to maintain a beautiful water-wise landscape and save money
 - Encourage everyone to join the team and do their part to save water

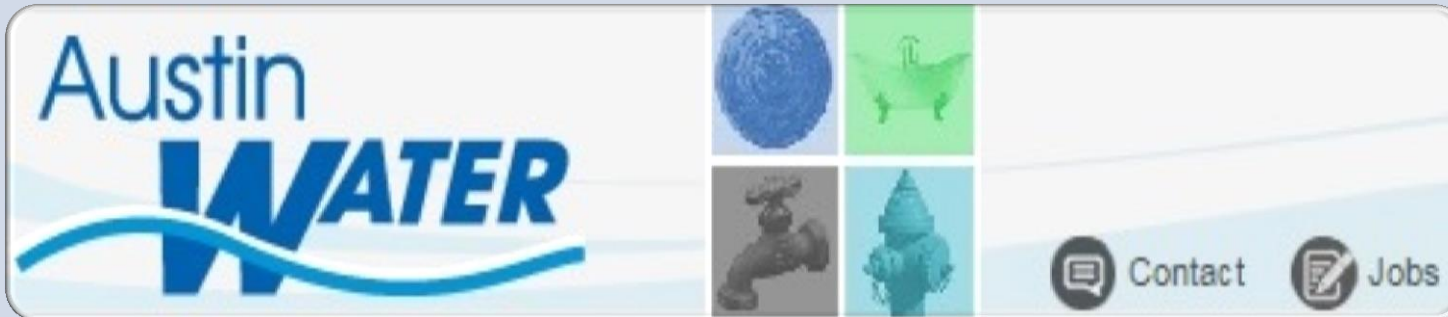


Water twice a week or less and you're on the team.

Getting on some teams requires lots of running and sit-ups and stuff like that. Getting on Team Lawn Whisperer is easy. Just water twice a week or less. And sign up for special teams by mulching your bushes and flower beds. Ready to join? Save water. Nothing can replace it.

SaveNorthTexasWater.com
WATER JUST TWICE A WEEK OR LESS.

58



Key Water Efficiency Programs:

Education Initiatives:

Dowser Dan Since it premiered in 1991, The Dowser Dan School Assembly Program has taught the important message of water conservation to students throughout the City of Austin's water service area. Each school year, from September through June, "The Dowser Dan Show" tours to over 155 public and private elementary schools in six school districts, including Austin ISD. In 2014, 22,000 area elementary students participated in the assembly program.

Speakers Bureau - The Water Conservation Speakers Bureau consists of conservation staff members who speak on topics such as water conservation, irrigation, leak detection, and water waste. They are available seven days a week for day and evening presentations to speak to a variety of audiences.

Links and Resources

- City of Austin Environmental Portal @ <http://www.austintexas.gov/resident/environmental>

Save Water with Dowser Dan



WATER CONSERVATION STUDY



City West Water™



Key Water Efficiency Programs:

Drought change in Demand and permanent restrictions:
In 2012, water restrictions ceased and new permanent water restrictions were implemented.

Water restrictions

Permanent water use rules were put in place as of 1 December 2012.

What permanent water use rules mean

Residential and commercial gardens and lawns

Hand watering

Gardens and lawns can be watered **at any time, on any day** using a hand held hose fitted with a trigger nozzle.

Watering systems

Watering systems (manual or automatic, spray or dripper) can be used to water gardens and lawns from **6pm to 10am, on any day**.

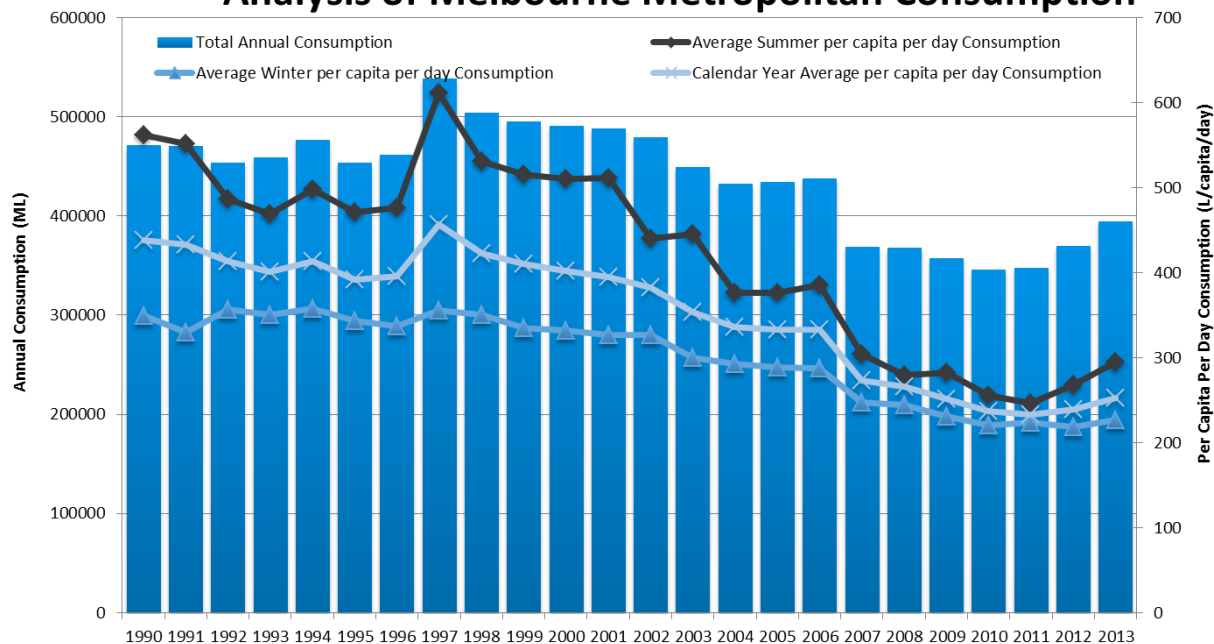
Car washing

At home

Cars may be washed at home with the following methods at **any time, on any day**:

- high pressure cleaning unit
- hand held hose fitted with a trigger-nozzle
- watering can
- bucket

Analysis of Melbourne Metropolitan Consumption



WATER CONSERVATION STUDY

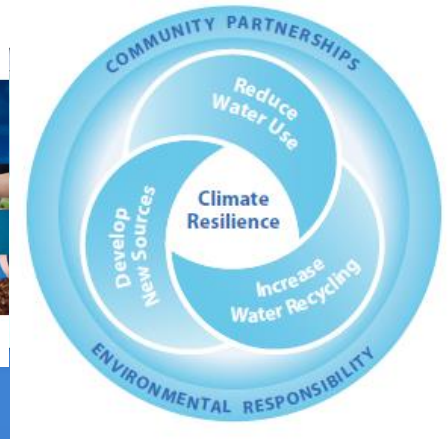


Water Forever

Whatever the Weather

Water recycling and water efficiency

1 May 2013



Key Water Efficiency Programs:

Waterwise Office Program: is delivered in partnership with the Property Council of Australia and the City of Perth. The program provides a tool (benchmarks) for owners and managers of large commercial office buildings to identify whether water can be saved and provide recognition of best practice water use. Eight office buildings are currently endorsed as Waterwise with a further four working towards endorsement.

Waterwise Development Program: The Corporation delivers this program in partnership with the Urban Development Institute of Australia (WA Division). The program provides an opportunity to acknowledge the important role of the development sector in ensuring our communities are using water as efficiently as possible while sustaining our unique lifestyle. This program recognizes exceptional water efficiency outcomes in all new water sensitive developments. Thirteen developments are currently participating in the program. Water Corporation is working closely with key stakeholders, such as the Urban Development Institute of Australia and the WA Local Government Association, to identify strategies to engage the development and building sectors in the program.

Smart Meters and My Water: Smart meters collect water use data from water meters at regular intervals and send the information to the Water Corporation. The technology was trialed in Kalgoorlie-Boulder where there are now 13,800 smart meters installed at properties. Over 14,000 smart meters have been installed at properties throughout the Pilbara region. Customers with a smart meter can view their hourly water use in My Water, the Water Corporation's self-service website. These customers also receive an email if a continuous flow is detected at their property, helping them to fix leaks straight away, saving water and money. Without a smart meter, the leak would not have been detected until we next visited the property to manually read the meter. This would have resulted in a loss of enough water to fill an Olympic sized swimming pool more than 1.5 times

WATER CONSERVATION STUDY



Key Water Efficiency Programs:

Large Customer Subsidized Water Audits:

- Install sub-meters throughout key water using areas of site.
- Smart metering of all major water using areas.
- Undertake water balance of site.
- Detailed walk through and analysis of water use on site
- Reporting on all water conservation recommendations

Irrigation Efficiency Program

- Work with largest irrigators especially councils.
- Undertake detailed audit of these facilities.
- Report water conservation opportunities.

WaterWise rules (non-drought ongoing rules):

- All hand-held hoses must have a trigger nozzle.
- Watering with a sprinkler, irrigation system or trigger nozzle hose is permitted any day before 10am and after 4pm, to avoid the heat of the day
- No hosing of hard surfaces such as paths and driveways
- All vehicles should be washed with a bucket, trigger nozzle or pressure cleaner.

BASIX[®]
Building Sustainability Index



Planning & Environment

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- ▶ About BASIX assessment
- ▶ Swimming pools and BASIX
- ▶ BASIX certificates
- ▶ View an ideal BASIX home



BUILDING PROFESSIONALS

- ▶ Consult the BASIX help notes
- ▶ Heritage controls and BASIX
- ▶ BASIX dwelling types
- ▶ Latest news and information



COUNCILS AND CERTIFIERS

- ▶ Low water use plant species
- ▶ BASIX legislation
- ▶ Check legal definitions
- ▶ Guide to certifying Simulation

BASIX is a New South Wales statewide initiative.

WATER CONSERVATION STUDY

Additional information is available online for each participating agency:

- Water Saving Partnership, Seattle, WA
 - www.savingwater.org
- Portland Water Bureau, OR
 - www.portlandoregon.gov/water/26426
- East Bay Municipal Utility District, CA
 - www.ebmud.com
- Irvine Ranch Water District, CA
 - irwd.com
- Southern Nevada Water Authority, NV
 - www.snwa.com
- San Antonio Water System, TX
 - www.saws.org
- Dallas Water Utilities, TX
 - dallascityhall.com/departments/waterutilities
- Austin Water, TX
 - www.austintexas.gov/department/water
- City West Water, Melbourne, Australia
 - www.citywestwater.com.au
- Water Corporation, Perth, Australia
 - www.watercorporation.com.au
- Hunter Water, New South Wales, Australia
 - www.hunterwater.com.au

More information and detailed survey responses are available upon request from:

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(925) 831-0194
<http://maddauswatermanagement.com/>



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