Memorandum



DATE February 6, 2015

Honorable Members of the Quality of Life & Environment Committee: Dwaine R. Caraway (Chair), Sandy Greyson (Vice-Chair), Rick Callahan, Carolyn R. Davis, Lee M. Kleinman, Adam Medrano

SUBJECT Dallas Water Utilities Water Conservation Program Update

Attached is a briefing that will be presented to the Quality of Life & Environment Committee on Monday, February 9, 2015. The briefing will provide an update on the status of current water conservation programs and topics under review for development of the 2015 Water Conservation Five-Year Strategic Plan Update, currently scheduled for final consideration in early June.

Please let me know if you should need additional information.

Mark McDaniel

Assistant City Manager

c: The Honorable Mayor and Members of the City Council A.C. Gonzalez, City Manager Warren M.S. Emst, City Attorney Judge Daniel F. Solis, Administrative Judge Rosa A. Rios, City Secretary Craig D. Kinton, City Auditor Ryan S. Evans, First Assistant City Manager Eric D. Campbell, Assistant City Manager Jill A. Jordan, P.E., Assistant City Manager Joey Zapata, Assistant City Manager Jeanne Chipperfield, Chief Financial Officer Sana Syed, Public Information Officer Elsa Cantu, Assistant to the City Manager — Mayor and Council Jo M. (Jody) Puckett, P.E., Director of Dallas Water Utilities

Dallas Water Utilities

Water Conservation Program Update



Quality of Life & Environment Committee February 9, 2015







Briefing Purpose



- Provide an overview and update on:
 - Status of current water conservation programs
 - Topics under review for 2015
 Water Conservation Five-Year
 Strategic Plan Update



Outline

- Water Conservation Program Background
- 2015 Water Conservation
 Five-Year Strategic Plan Update
- Summary and Timeline
- Appendix



Water Conservation Program Background

- The 2000 Long Range Water Supply Plan recommended that aggressive water conservation measure be implemented and funded to reduce per capita consumption (GPCD) and water demand
- In 2001 Water Conservation Ordinance passed to change behavior and to reduce peak usage
- In 2004, Dallas continued to pursue water conservation by:
 - Expanding public awareness campaign
 - Developing technical studies
 - Developing a Five-Year Strategic Plan on Water Conservation

Water Conservation Five-Year Strategic Plan



- First Plan adopted by City Council in 2005
 - Defined goals for a five year period ending in FY 2009
- 2010 Strategic Plan Update adopted to:
 - Build on accomplishments of the original plan
 - Set new goals and programs for period ending in FY 2015

Strategic Approach to Achieve Water Conservation Goals







- Ordinance changes
- Programs to reshape behaviors
 - Public education and outreach
 - Rebate and incentive programs
- Programs impacting structural changes
 - Water loss/leak detection
 - Main replacement program
 - Toilet replacement programs
 - ICI and irrigation audit programs

Conservation Accomplishments

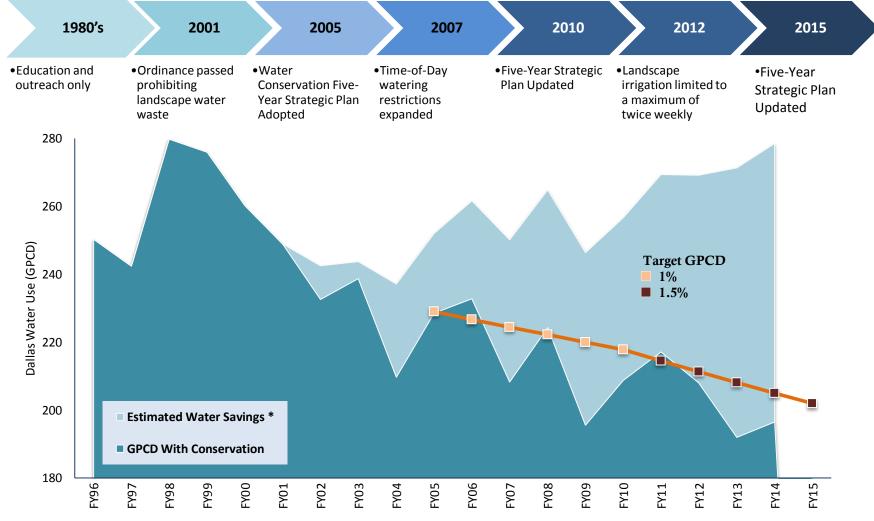
- Conservation measures adopted by the Council in Oct 2001 have been positive
 - Dallas has saved an estimated 250 BG of water (extending supply by almost 1.75 years)
 - GPCD has been reduced 27%
 - As a result, Dallas has been able to mitigate the impact of drought weather conditions on water supply
- Annual customer surveys from 2003 through 2014 indicate positive results:
 - Awareness of watering ordinance has increased from an average 60% to 76%
 - Customers reporting behavioral changes increased from an average 46% to 71%



Status of Strategic Plan Recommended Strategies

Strategy	Adopted Plan	Implemented			Year Implemented	Continue Strategy?	Comments
		Fully	Partially	Not			
Water Wise Landscape Events		✓			FY 1994	Yes	
DWU Water and Wastewater Ordinance Amendments		✓			FY 2001	Yes	Amended in FY 2001, FY 2006, FY 2012
Tiered Rate Structure		✓			FY 2001	Yes	
Public Awareness Campaign		✓			FY 2002	Yes	
Rain and Freeze Sensor Rebate Program		✓			FY 2003	No	Program discontinued in FY 2004
Leak Detection & Repair and Control of Water Loss		✓			FY 2005	Yes	Enhanced in FY 2007, FY 2009, and FY 2011
Environmental Education Initiative (K-12)	2005	✓			FY 2006	Yes	
Irrigation System Inspections	2005	✓			FY 2006	Yes	
Minor Plumbing Repair Program	2005	✓			FY 2006	Yes	
Water Conservation Mascot	2005	✓			FY 2007	Yes	
Cooling Tower Audits		✓			FY 2007	No	Program expanded in FY 2012
Water Conservation Grant Program for City Facilities	2005	✓			FY 2007	Yes	
Industrial/Commercial/Institutional (CI) Pre-rinse Spray Nozzle Program	2005	✓			FY 2007	No	Program no longer offered. Market saturated
Toilet Voucher/Rebate Programs	2005	✓			FY 2007	Yes	Projected to reach saturation in FY 2023
Hospitality Industry Program	2010	✓			FY 2011	Yes	
ICI Water Efficiency Surveys	2010	✓			FY 2012	Yes	
ICI Rebate Program	2010		✓		FY 2012	Yes	Scheduled for further review in FY 2015
ICI Commercial Equipment Ordinance Amendment	2010		✓		FY 2014	Yes	Phase I of Green Building Code Adopted
Accurate Supply Source Metering		✓			DWU BMP	Yes	
Universal Metering, Meter Testing Repair & Replacement		✓			DWU BMP	Yes	
Showerhead, Aerator Kits Handouts		✓			DWU BMP	Yes	
ICI Business Partnership Program	2010			✓			Scheduled for FY 2015
ICI Training Programs	2010			✓			Scheduled for FY 2015
Water-wise Landscape Design Requirements	2010			✓			Scheduled for review in FY 2015
Residential Irrigation System Incentive Program	2010			✓			Program postponed
Residential Clothes Water Incentive Program	2010			✓			Program postponed
Increased Enforcement Efforts	2005		✓		DWU/CCS BMP		Scheduled for FY 2015

Water Conservation Program Chronology and Trends





2015 Water
Conservation
Five-Year Strategic
Plan Update

Evolution of the Water Conservation Program

- With the success of water conservation programs over the past decade, the program has matured
- 2015 Strategic Plan focus is to
 - Maintain successes of prior programs
 - Evaluate effectiveness and life cycle of existing programs
 - Continue to develop and implement water conservation programs that will
 - Reduce peak demands, water loss and waste
 - Decrease per capita water use
 - Maintain quality of life
 - Allow for continued growth and economic development

Topics Under Review for 2015 Strategic Plan



- Key Initiatives for additional conservation savings being evaluated include:
 - Landscape Ordinances
 - Focus on high-use retail customers
 - Addition of a multi-family retail rate class
 - Wholesale Customer Cities Outreach
 - Use of mobile technologies to impact customer behavior
 - Continuation and/or revision of existing programs includes:
 - Water system efficiencies

Landscape Ordinance Amendments



- In Spring 2015, Sustainable Development and Construction will work with the Zoning Ordinance Committee to review measures to strengthen current landscape and tree ordinance for both residential and commercial customers
- Strategies to be reviewed for new and renovated landscapes include
 - Limiting turf areas in all new landscapes
 - Define and require drought tolerant plants in new landscapes
 - Require a minimum of 6 to 8 inches of quality topsoil
 - Guidelines for operating ornamental water features
 - Incorporate rainwater harvesting in buildings and roof areas exceeding 10,000 square feet
- Require existing irrigated plant material to be mulched
- Incorporate water efficient landscape design in irrigation system plan submissions and train city reviewers

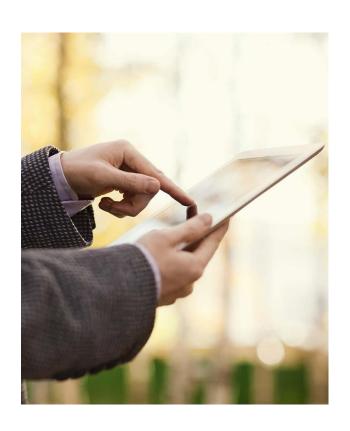
Focus on High-Use Customers

- Multi-family customers use almost 25% of all billed retail water and have similar use patterns to single-family residential customers
- Detailed analysis of multi-family includes:
 - Evaluation of a separate multi-family customer rate class
 - Additional outreach working with Code's Multi-Family Task Force
- Approximately 9% of commercial demands are from parks and golf courses
- Projects under evaluation for inclusion in the 2015 Plan include
 - Develop water budgets for customers modeled after Denver Water Program
 - City Hall Median Project

DWU's Wholesale Customer Cities Outreach

- Wholesale treated water customers comprise approximately 40% of DWU's total demand
- Wholesale Customer's treated water contracts require:
 - "Customer agrees to institute and maintain usage practices which ensure water is used in a manner that prevents waste, conserves water resources for their most beneficial and vital uses, and protects the public health."
 - Customers also agree to develop and implement water conservation and drought contingency plans and associated reports consistent with State requirements
- DWU will continue to work with wholesale customers to ensure contract compliance
 - Evaluate wholesale customer water conservation and drought plans
 - Establish and monitor metrics to measure water conservation goals based on:
 - water loss
 - water consumption
 - peak day demands
 - GPCD

Using Mobile Technologies to Impact Customer Behavior



- Enhanced utilization of AMR/AMI technology
 - Improves customer service by providing "real time" feedback on water usage
 - Helps customers conserve by identifying possible leaks on a timely basis
- Public education using mobile applications and increased internet customer engagement
 - Collaborative efforts with North Texas Commission (SPRINKLY) and Wyland Foundation WaterSmart Program
- Increased social media presence

Water System Efficiencies

- Well-run utilities maintain their infrastructure through proper levels of inspection, repair and replacement
- Three pronged effort to actively manage water distribution system
 - Leak detection
 - Main break and service repairs
 - Main replacement
- Accurate measurement of water delivered
 - Meter testing
 - Meter repair
 - Meter replacement

Water System Management

- DWU has 4,922 miles of water pipeline and over 300,000 meters
 - Pipeline replacement and maintenance is required for system reliability
 - Known system replacement need is approximately 309 miles or 6%
- Pipeline failures result in higher repair costs and significant potential customer impacts including:
 - Service interruption to schools, hospitals, homes and businesses
 - Traffic delays due to reconstruction
 - Potential public safety issues
 - Road damage, sinkholes, frozen streets, etc.
 - Possible additional impact on other utilities such as gas, electric, phones/internet, etc.

Reduce Water Loss through Inspection of Pipelines -

Leak Detection

Benefits of program:

- Estimated to reduce main breaks by about 25%
- Less impact to customers and environment
- Reduces likelihood of personal injury or property damage that can occur from a failure
- Reduced impact to paved roadways

2014 Accomplishments

- Leak Detection resulted in savings of 0.2 BG
- An avoidance of approximately 1.0 BG from a reduction in main breaks
- Annual operating cost of the program is about \$2M resulting in a cost of \$1.67 per 1,000 gallons (average cost of new water supply is \$2.00 per 1,000)

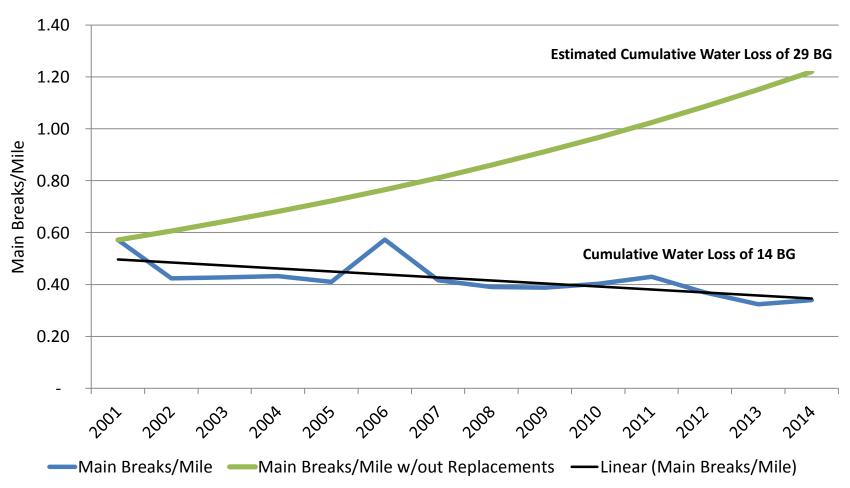


Distribution System Main Replacement Program



- Main replacements are primarily driven by the business decision to continue to repair versus replacement
- Recurring repairs result in additional water loss that could be avoided when the main is replaced
- Projects are identified and prioritized based on maintenance history and not on an estimate of water loss savings
- A 1% annual average replacement rate has resulted in a reduction of 0.06 breaks/mile each year with cumulative savings estimated to be 15 BG

Estimated Impact of 1% Main Replacement Rate



Main Replacement Goals and Accomplishments

Action Taken:

- Based on the 2002 Efficiency Study a goal was set to replace 50% of Water Distribution System in next 30 Years to achieve a 70 Year Replacement Cycle (averaging 1.4% per year)
- Pipelines are replaced based on parameters including: likelihood of failure, consequence of failure, water quality, materials, break frequency, soil, etc.
- o FY 2014
 - 45.0 miles of water pipeline replaced at a cost of \$42 Million
 - Average replacement rate of approximately 1.0% of System per year

• Accomplishments:

- Since 2001 DWU has achieved the following:
 - Percent of system older than 50 years has been reduced from 48% to 42%
 - Main breaks per mile has decreased from 0.6 to 0.3

Meter Maintenance Program



- Actions Taken
 - Goal to replace meters every 10 to 15 years
 - Eight two-man crews work on large meters
 - 65 employees work on small meters
- Accomplishments
 - FY 2014 Accomplishments
 - 38,314 small meters were replaced in FY2014
 - Tested 1,663 large meters
 - Exceeds two-year test goal
 - A 60% increase in exchange volume



Summary

- Water Conservation remains our most cost-effective water supply
 - Reuse and conservation are an integral part of Dallas' future water supply planning scheduled to meet 48% of our future need
- Dallas has made great strides in reducing its per capita water demand through the use of conservation and efficiency programs
 - A 22% decrease in annual usage since FY 2002
 - Ongoing water conservation efforts have saved approximately 250 BG or 68 MGD
- Current water conservation goal is to reduce per capita water use by 1.5 percent per year
- 2015 Water Conservation Five-Year Strategic Plan Update will keep momentum going and set new goals for further reductions in per capita water use

2015 Water Conservation Five-Year Strategic Plan Update Timeline

December 2014

- February 2015
- Identification and screening of proposed new measures
- Seek stakeholder input/feedback



March - April 2015

- Determine annual water savings potential
- Develop budget and staffing requirements

May 2015

- Develop implementation schedule for FY 2016- FY 2020
- Develop new five year goal for annual reduction in GPCD

June 2015

Council adopts 2015
 Water Conservation
 Five-Year Strategic Plan
 Update

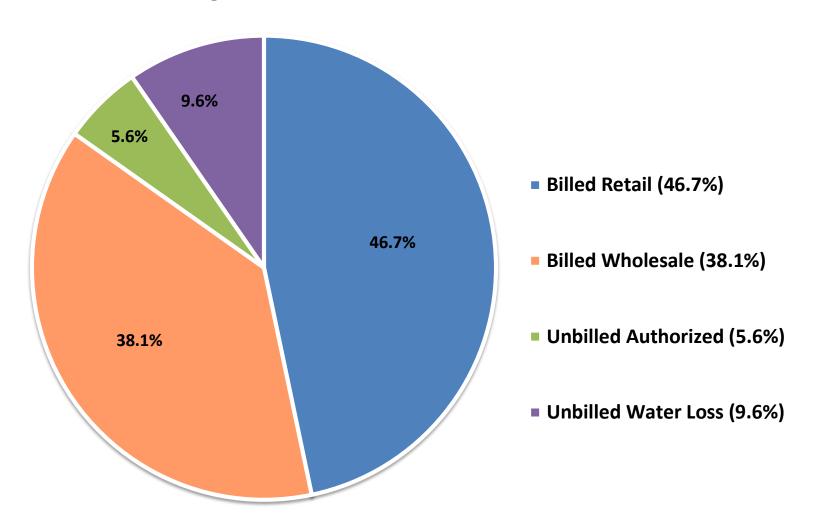


Appendix

- How DWU's Water is Used
- Status of Conservation Strategic Plan Programs
- Lawn & Landscape and Green Building Ordinances
- Conservation Program Budget
- Public Awareness Annual Survey Results
- Pipeline Replacement Prioritization
- Per Capita Water Use from Texas 2012 State Water Plan
- Mobile Applications

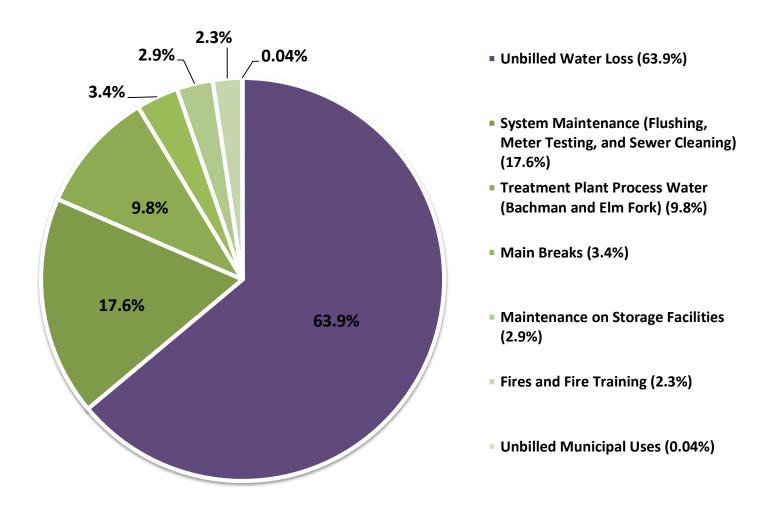
How DWU's Service Area Treated Water is Used

Average Annual Treated Water Use from FY 2011 – FY 2014



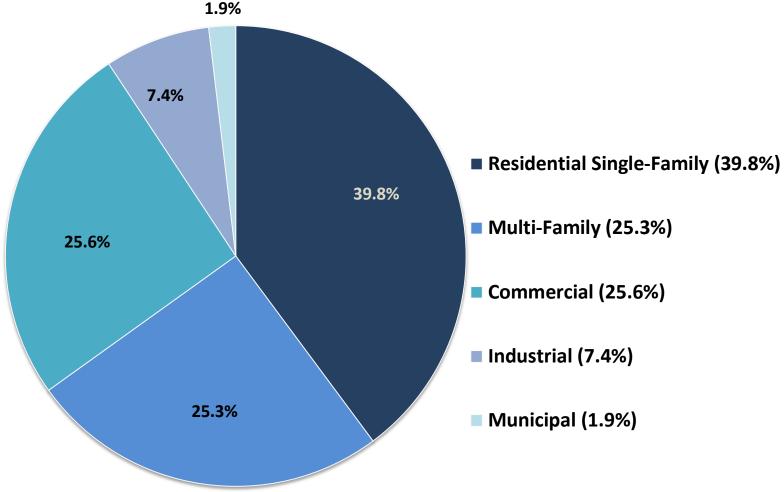
How DWU's Unbilled Treated Water is Categorized

Annual Average Unbilled Water Use from FY 2011 - FY 2014



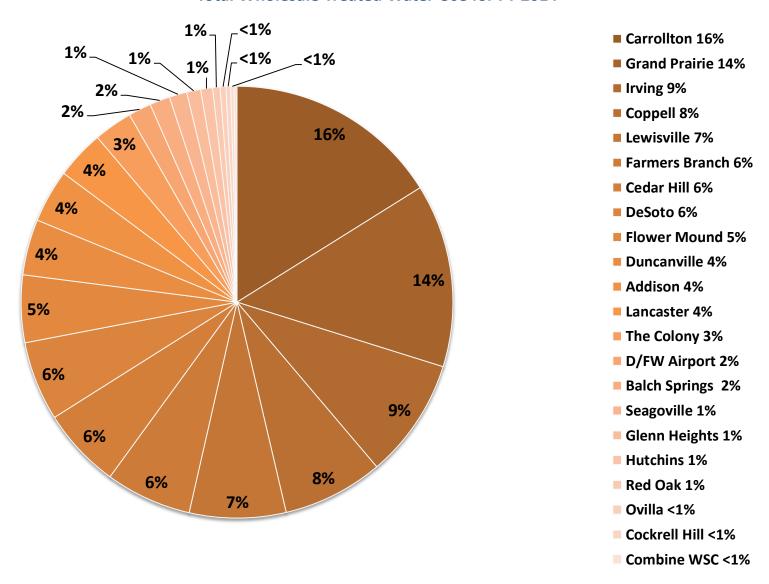
How City of Dallas Retail Treated Water is Used

Annual Average Retail Treated Water Use from FY 2011 – FY 2014



How DWU's Wholesale Treated Water is Used

Total Wholesale Treated Water Use for FY 2014



Status of Conservation Strategic Plan Programs Maximum Twice Weekly Watering

Actions Taken

- 2010 Strategic Plan Update initially recommended as voluntary measure
- Water Conservation ordinance amended in April 2012 requiring mandatory action due to drought conditions

Accomplishments

- Since implementation, water consumption is 5 to 6% lower
- Non-watering days are 25 to 40 MGD or an average of 8% less than watering days

City of Dallas Maximum Twice Per Week Watering Schedule					
Last Digit of Address	Watering Days Allowed				
0, 2, 4, 6 or 8 (even numbers)	Sundays and Thursdays				
1, 3, 5, 7 or 9 (odd numbers)	Saturdays and Wednesdays				
No address number	Sundays and Thursdays				

Status of Conservation Strategic Plan Programs ICI Water-efficient Equipment Rule



Action Taken

 Guidelines effective October 2013 with ordinance amendment to Dallas Green Construction Code

Accomplishments

- Ordinance requires minimum water efficiency standards for commercial equipment in new and newly occupied ICI establishments
- Proposed projects must meet water reduction strategies that include
 - Installing high-efficiency (low flow) fixtures
 - Meet 3 of the 5 following criteria:
 - Average flow rates for lavatory faucets, shower heads, and/or toilets
 - And/or ENERGY STAR labeled dishwashers or clothes washers

Status of Conservation Strategic Plan Programs Water-wise Landscape Design Requirements

 Measure developed to expand ordinance requirements to limit turf areas in all new landscapes and require low water-use landscaping in other areas

Actions Taken

 DWU will be working with Sustainable Development and Construction Department on proposed ordinance amendment to Chapter 51 Article X-Landscape and Tree Preservation Regulations of Dallas City Code

Next Steps

- Zoning Ordinance Committee (ZOC) currently reviewing ordinance amendment for urban agriculture
- ZOC is scheduled to begin review of Article X to include landscape, irrigation and trees
- It is anticipated ZOC and CPD review will take months given the complexity and nature of issues being considered

Status of Conservation Strategic Plan Programs Texas High Efficiency Toilet (HET) Law



Actions Taken

- 2009 Texas HB 2667 requires highefficiency toilets in all new residential and commercial construction
- Required that toilet and urinal retailers phase in HETs within four years starting in 2009

Accomplishments

 As of January 1, 2014, all toilets and urinals sold in Texas must be HETs

Status of Conservation Strategic Plan Programs ICI Hospitality Program



Actions Taken

- Authorized by Council in FY2011
- Participating hotels urge guests to request fewer linen and towel changes
- Participating restaurants serve water by request only
- Free marketing and promotional tools are provided to participating customers

Accomplishments

 Forty-six hotels and 36 restaurants currently participate in the program

Status of Conservation Strategic Plan Programs ICI Customers Water Audits

Actions Taken

- Authorized by Council in FY 2012 to help commercial customers and small businesses save water and money
- On-site evaluations include
 - Cooling towers, boilers and other thermodynamic operations
 - Plumbing fixtures, fittings and equipment
 - Landscape irrigation
 - Laundry operations
 - Laboratory and medical facilities

Accomplishments

- Over 100 water efficiency assessments have been performed since program launch
- Recommended process and equipment improvements could result in estimated water savings of over 215 MG per year

Status of Conservation Strategic Plan Programs ICI Training Program & Business Partnership/Stakeholders





- Develop training programs for facility managers of premise types that use the most water and licensed irrigators with a focus on the EPA Water Sense program
- Develop process for ongoing dialogue with business leaders who represent top water using industries with focus on new programs, what's working, what's not working
- Both strategies are scheduled for implementation in FY 2015

Status of Conservation Strategic Plan Programs Residential Toilet Replacement Incentives

Actions Taken

- "New Throne for Your Home" toilet program launched in FY 2007
- Offers free toilets and/or rebates to qualified residential and multi-family applicants
- Contract awarded in May 2014 to continue program through May 2019

Accomplishments

- To date, over 77,000 toilets have been distributed with an estimated water savings of over 350 MG per year
- Saturation point expected to be reached by FY 2023

Status of Conservation Strategic Plan Programs ICI Financial Incentive Program

Actions Taken

- Program authorized by Council in FY 2012
- Offers incentives to Industrial, Commercial and Institutional (ICI)
 customers for water efficient equipment installation and upgrades
- To date, two rebate applications have been submitted
- Program under evaluation for re-structuring as part of 2015
 Strategic Plan Update
 - Issues raised by ICI audit customers about current program structure
 - Rebates not enough to motivate customers to take action
 - Does not include project labor costs
 - Toilet rebate/voucher component needed for middle and small business customers

Public Awareness Campaign Results

- Creative partnership with Tarrant Regional Water District since 2009 has resulted in:
 - Dallas and Tarrant Counties share a message with one voice to conserve
 - Double the message coverage
 - Costs for creative development are shared by the two agencies



Status of Conservation Strategic Plan Programs Measures Not Implemented





- Residential Irrigation and Landscape Incentive Program to help customers retrofit existing irrigation systems with water-conserving equipment
- Residential Clothes Washer Rebate to help customers replace older clothes washers with high-efficiency clothes washers



Lawn & Landscape and Green Building Ordinances

Background - Ordinances





- Dallas currently operates under the 2006
 International Plumbing Code (IPC) with adopted
 NTCOG and city amendments
- A primary objective of the 2006 IPC is to protect the potable water supply from contamination
- The use of gray water and other non-potable water is allowed with this primary consideration in mind
- 2006 IPC provides for the minimum code requirements for potable water fixture use
- Dallas code amendments allow for the use of water-efficient fixtures and non-potable water systems for reuse

Lawn and Landscape Watering Ordinance

- Requires that landscape irrigation water be used in a manner that prevents waste, conserves resources and protects public health and safety
 - Adopted in 2001 and amended in 2007 and 2012
- Major components of the ordinance include:
 - Mandatory maximum twice-per-week irrigation schedule
 - Irrigation prohibited between 10 a.m. and 6 p.m., from April 1 through October
 31 of every year
 - Operation of irrigation systems with faulty pipes or systems with broken, misaligned or missing sprinkler heads is prohibited
 - Irrigation prohibited during any form of precipitation or when temperatures are below freezing
 - Rain and freeze sensors are required on all automatic irrigation systems
 - Excessive runoff resulting from overwatering is prohibited
 - Watering impervious areas such as sidewalks and streets is prohibited

Green Building Ordinance



- The purpose of the Green Building Ordinance is to:
 - Reduce the use of natural resources
 - Create healthier and more sustainable living environments
 - Minimize the negative environmental impacts of development in Dallas
- Ordinance adopted in April 2008
- Phase I became effective October 2009
- Phase II became effective in September 2012

Green Building Ordinance – Phase I and II



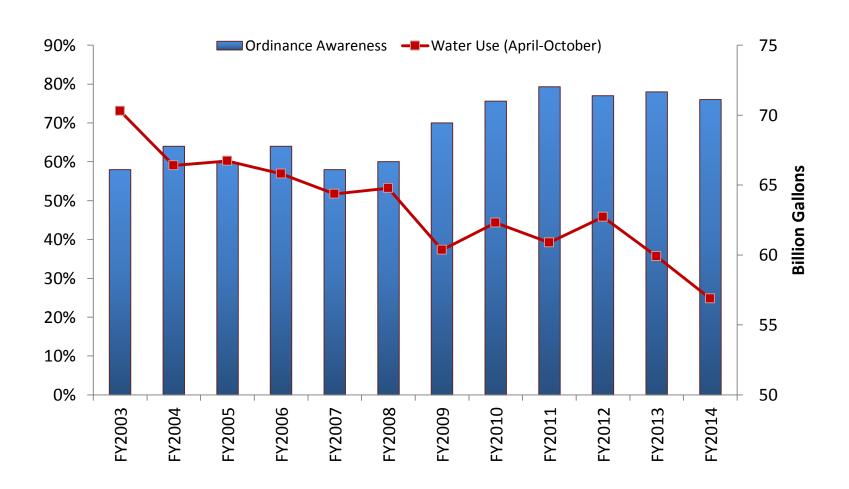


- Phases I and II apply to all new construction
 - Phase I requires that
 - All projects must demonstrate a 20% reduction in water use from the baseline calculated for the total water fixtures determined under the 2006 IPC
 - 20% water reduction may be met by compliance with Greenbuilt Texas, LEED or LEED equivalent acceptable methods
 - Phase II strengthens the water conservation requirements of Phase I, including but not limited to
 - The utilization of drip irrigation emitters for all bedding areas
 - Meeting water reduction strategies that include installing high efficiency (low-flow) plumbing fixtures and fittings

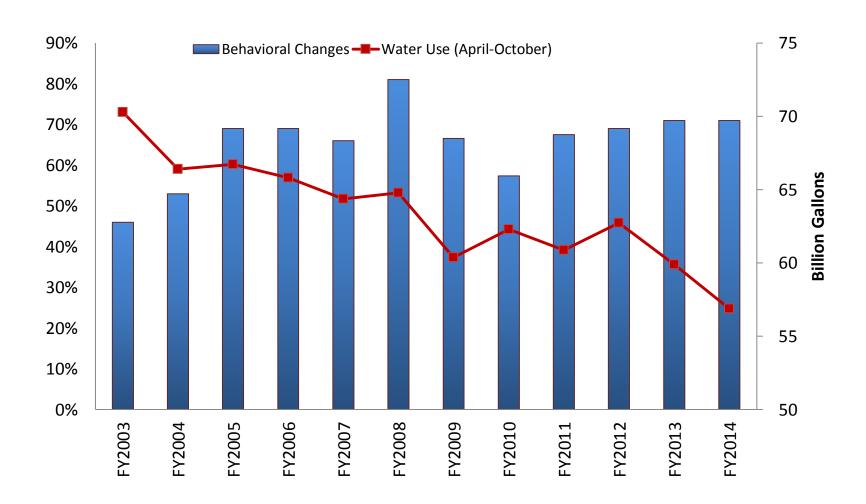
Water Conservation Five-Year Strategic Plan Budget Summary (FY 2011-FY 2015)

	Water Conservation Division Budgets				
Budget Item	FY	FY	FY	FY	FY
	2010-11	2011-12	2012-13	2013-14	2014-15
Salaries and Benefits	\$688,621	\$753,273	\$910,149	\$941,040	\$996,151
Other Operating Expenses	\$544,510	\$223,919	\$237,633	\$120,337	\$139,659
Public Awareness Campaign	\$1,380,000	\$1,380,000	\$1,380,000	\$1,320,000	\$951,800
Regional Campaign (TRWD)	\$0	\$0	\$0	\$150,000	\$150,000
Minor Plumbing Repair Program	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000
Environmental Education Initiative	\$161,757	\$179,885	\$200,421	\$274,000	\$358,713
New Throne for Your Home	\$1,216,820	\$1,217,220	\$1,217,820	\$1,376,000	\$1,376,000
Residential Irrigation/Landscape Rebates	\$0	\$0	\$0	\$250,000	\$250,000
ICI Customer Water Audits	\$0	\$148,462	\$148,462	\$148,462	\$148,462
ICI Training Programs	\$0	\$0	\$0	\$0	\$25,000
ICI Hospitality Program	\$110,000	\$110,000	\$110,000	\$110,000	\$110,000
ICI Rebate Program	\$695,000	\$2,000,000	\$2,000,000	\$1,555,000	\$1,555,000
City Leadership Grant Program	\$195,000	\$195,000	\$195,000	\$195,000	\$195,0000
Approved Budget	\$5,391,708	\$6,607,759	\$6,799,485	\$6,839,839	\$6,655,785

Ordinance Awareness vs. Water Use



Behavioral Changes vs. Water Use



Pipeline Replacement Prioritization

Based on Repair History

Break Index Calculation

Prioritization

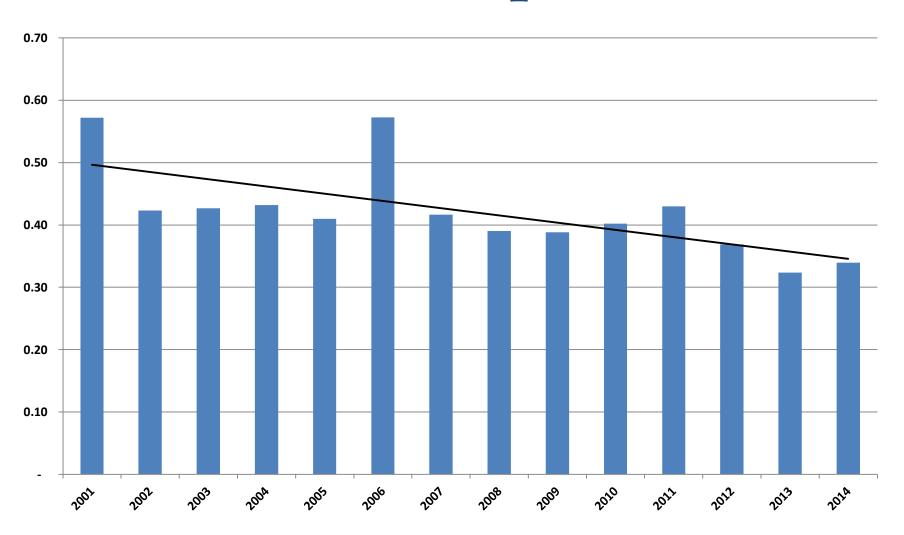
Priority*	Break Index
1	2.0+
2	2 to 1.5
3	1.5 to 1.0
4	1.0 to 0.75
5	0.75 to 0.4

Other Factors Considered in Prioritization

- Water quality issues
- Potential property damage
- Impact to customer service
- Other projects in the area
- Soil corrosivity
- Type of thoroughfare
- System improvement (capacity)
- Size, age and type of pipe
- Impact to other utilities
- Difficulty of access for maintenance

^{*}Priority 1 = Most urgent need of replacement

Main Breaks per Mile



Per Capital Water Use

- Excerpts from Texas 2012 State Water Plan's Population and Water Demand Projections

City	2008 Per Capita Use	2008 Residential Per Capita Use
Frisco	254	158
Plano	223	113
Dallas	213	95
Irving	193	104
Fort Worth	192	75
Austin	171	102
Arlington	157	100
San Antonio	149	92
El Paso	137	98
Houston	134	65

Mobile Applications

SPRINKLY

- Created from North Texas Commission's App Contest held last summer
 - Contest was held last summer to develop water conservation outreach application
- App can be used on Smartphones, tablets and computers
 - Will allow users to set up email reminders for their watering days and times based on zip code
 - Smart alerts will inform users of rain forecasts
- App is scheduled to be available in Spring 2015

Water Smart Software

- City received as prize for winning 2014
 National Mayor's Challenge for Water Conservation
 - Currently under review as a pilot project
 - Customers receive customized email reports with tips and data on their individual water usage

