



# 2005 Water Conservation Annual Report

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Quality of Life Committee  
March 27, 2006



# Briefing Outline

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- Dallas Water Conservation Chronology
- Consumption Trends
- Year 1 Highlights of Water Conservation Five-year Strategic Plan
- Lessons Learned
- Going Forward



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# Dallas Water Conservation Chronology



# City of Dallas Water Utilities Recent Conservation Efforts

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- 1999
  - State required Water Conservation and Drought Contingency Plans updated and adopted by Council
- 2001
  - City Council amended Water Ordinance to include mandatory watering requirements
    - 4<sup>th</sup> tier added to rate structure to encourage water conservation
- 2002
  - Public relations firm hired to develop and implement an aggressive multi-media water conservation public awareness campaign
- 2004
  - Technical consultant hired to help develop a Five-year Strategic Plan on Water Conservation

# City of Dallas Water Utilities

## Conservation Efforts continued

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- 2005
  - Updates to 1999 Water Conservation & Drought Contingency Plans adopted by Council
    - Conservation Plan includes five and ten-year water reduction targets
      - Required by House Bill 2660
    - Drought Contingency Plan includes quantifiable goals to mitigate drought conditions
      - Required by House Bill 2663
  - Council adopted Five-year Strategic Plan

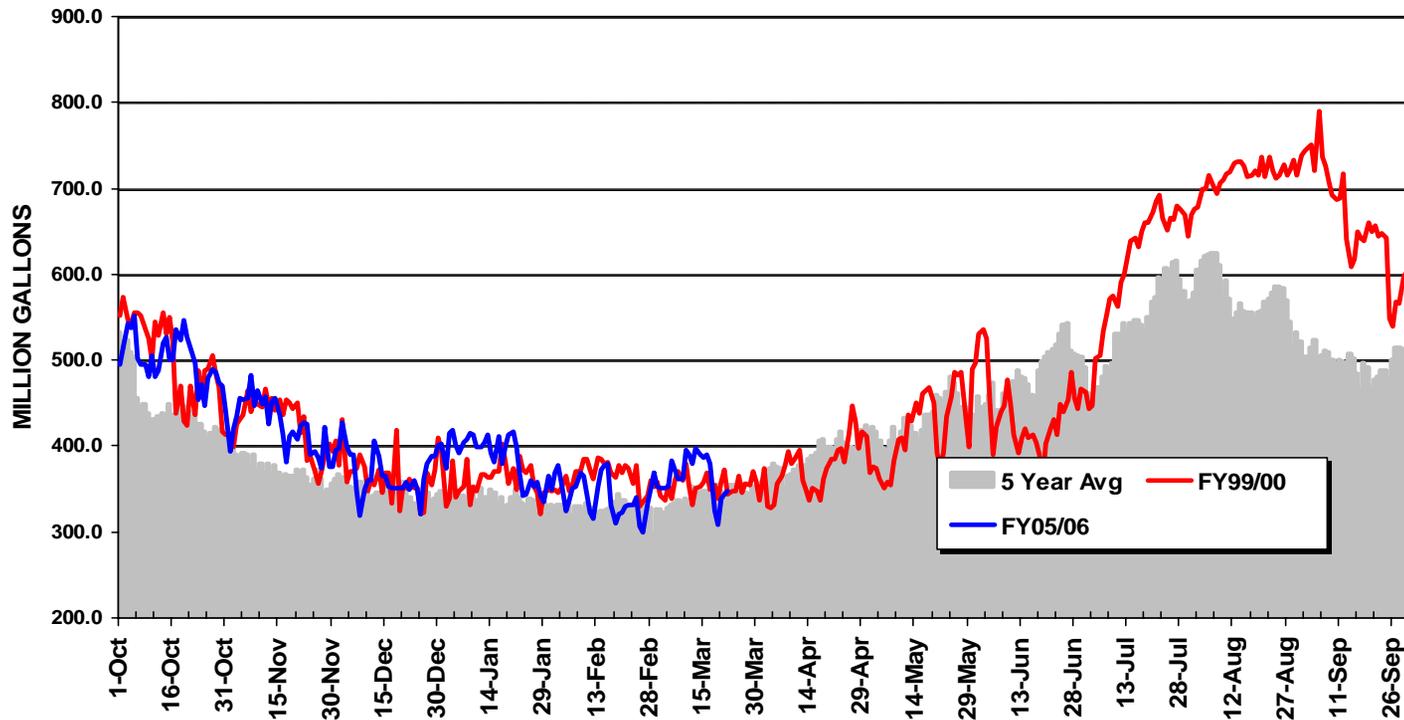


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# Consumption Trends

# Dallas Water Utilities System

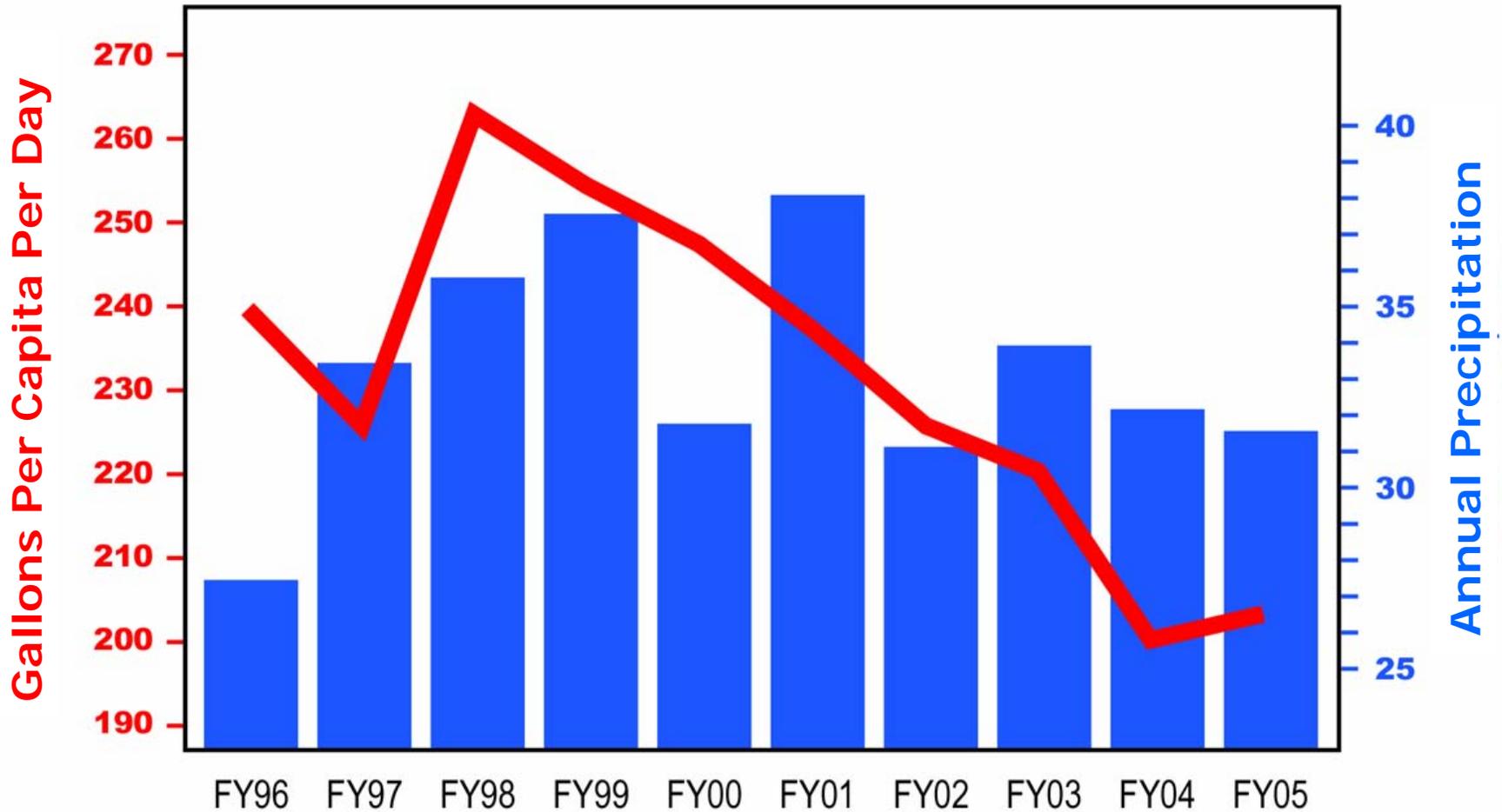
## Daily Water Consumption (FY00 and FY06)



- 2006 compared to 2000
  - Population has increased by 14%
  - GPCD has decreased by 18%
  - Year-to-date consumption increase of .63%

# City of Dallas

## Consumption (GPCD) vs. Precipitation





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# Water Conservation Five-year Strategic Plan



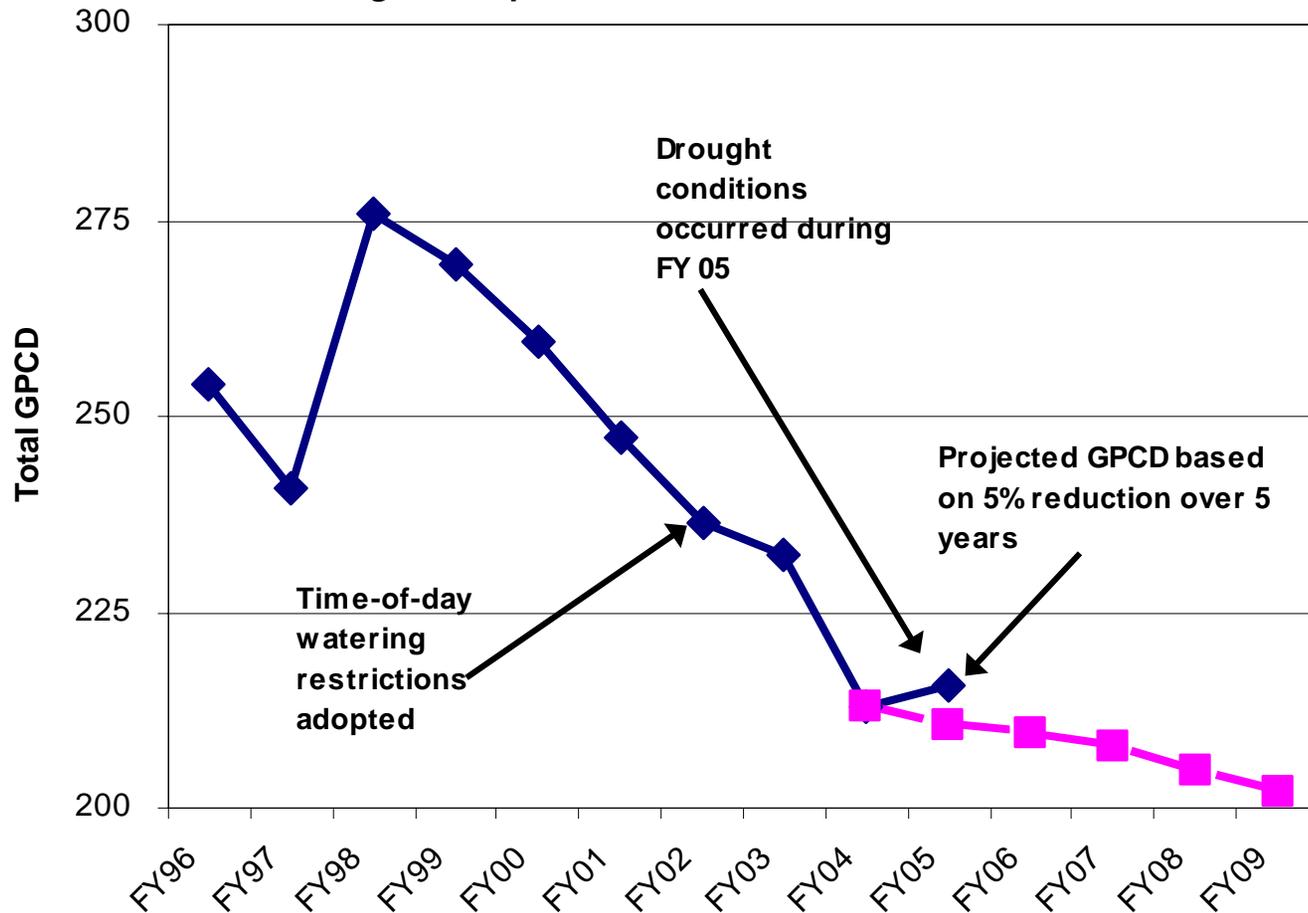
# Five-year Plan Defined

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- Integral part of long-range water supply strategy
- Includes clearly defined goals and objectives and best management practices
- 60 month plan developed as an operational tool to reduce overall per capita consumption for fiscal years 2005 through 2009

# Five-year Plan Goal

- To reduce overall per capita consumption by 5% over a five-year period





# Five-year Plan Elements

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- City Leadership & Commitment to Water Conservation
- Enhanced Education & Outreach Initiatives
- Rebate & Incentive Programs



# Water Conservation Five-year Strategic Plan

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## Year 1 Highlights



# City Leadership & Commitment

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- Performed detailed irrigation audits and landscape surveys at three city-owned facilities
  - Fire Station #10
  - Kiest Park
  - Skyline Branch Library

# Sites Surveyed



# City Leadership & Commitment continued

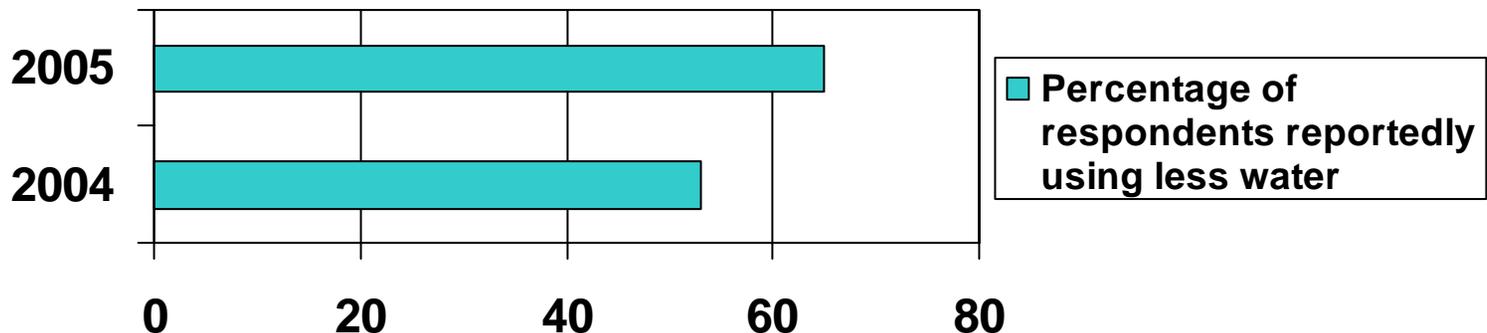
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- Surveyed indoor plumbing fixtures at twenty City-owned facilities (list in appendix)
  - 90% of fixtures are water efficient models
  - Upgrades to remaining 10% could yield 9.3 million gallons in water savings over the lifetime of the fixtures
- Increased City's exposure and involvement in the water conservation arena at state and national levels
  - Conservation Program recognized in American Water Works Association's *Water Wiser Spotlight* internet newsletter in August 2005

# Enhanced Education & Outreach Initiatives

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- Hired new consultant to continue public awareness campaign
  - Recall of advertising up in 2005 compared to 2004 (65% v. 51% respectively)
  - Reports of changes in behavior higher in 2005 compared to 2004 ( 69% v. 53% respectively)



# Enhanced Education & Outreach Initiatives continued

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- Contracted with educational consultant to develop and implement K-12 water activities program for Dallas students
- Developed City's first Environmental Educational Initiative (EEI) collaborative effort with Department of Sanitation Services
  - See page 34 in appendix for details on year-to date outreach statistics

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Throw Away

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# Enhanced Education & Outreach Initiatives continued

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- Held “mascot” election for elementary school children
  - Goal to receive 1,000 votes
  - Over 2,600 votes cast online and by paper ballot
  - “Dew” elected as Water Conservation mascot



# Rebate & Incentive Programs

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- Rain/freeze sensor rebate program for automatic irrigation systems 2004:
  - Goal was to reach 300 households, but, over 9,500 monetary rebates or free sensors were issued
- Repair/Fixture Replacement Program (Pilot Phase), as of Nov. 2005 (details in appendix)
  - 110 applications received
  - 45 jobs completed
  - Goal is to serve 300



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# Lessons Learned



# What's Working

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- Public Awareness Campaign
  - Conservation Program slated to receive Watermark Award for Communications Excellence from the Water Environment Association of Texas and the Texas Section of the American Water Works Association
    - Award will be presented at the Texas Water 2006 Conference in April 2006

## What's Working (continued)

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- Enhanced school education program
  - Programming directly aligned with Texas Essential Knowledge and Skills (TEKS) requirements
    - Program has successfully served as an enhancement to current classroom exercises
  - A user-friendly, interactive website has been established for teachers to request water and recycling classroom presentations

## What's Working (continued)

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- Minor leak repair/fixture replacement program
- Water Conservation Ordinance
  - Particularly time-of-day restrictions
- Leak Detection Program



# Opportunities for Improvement

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- Enforcement Efforts
  - 33 warnings and 0 citations issued for FY 05/06
  - Continue to explore options to improve efforts
- Water use data refinements to better identify opportunities for water demand reduction
  - Streamline data retrieval process
  - Resolve errors in data set
  - Implement data management procedures specific to the needs of water conservation



# SAWS Approach to Enforcement

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- Complaint made to 311 center
- Case referred to SAWS inspector
- Inspector contacts customer and “educates” on how to correct problem
  - Emphasis on education
- If second complaint made, customer’s name placed on “water wasters” list
- SAPD (police) monitors list and issues citation if violation occurs



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# Going Forward Year 2 Planned Activities



# City Leadership & Commitment

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- Implement recommended changes for landscape conversions and irrigation system maintenance
- Continue to perform irrigation audits and landscape surveys
- Continue to perform indoor plumbing fixture surveys
- Refine collection and analysis of DWU water use data
- Continue leadership efforts on local, state and national levels



# Enhanced Education & Outreach Initiatives

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- Continue Public Awareness program and grass-roots outreach efforts
- Continue school education program and expand outreach to cover K-8th grade students
  - First year covered K-5 students
- Plan and design a pilot-scale residential customer audit program



# Rebate & Incentive Programs

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- Continue Minor Leak Repair\Fixture Replacement Program
- Plan and design a pilot Single and Multi-family Ultra low-flow toilet rebate program
- Plan and design a pilot program for industrial, commercial and institutional customers

# Summary

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- Five-year Strategic Plan Year 1 activities were accomplished on time and within budget
- Conservation efforts are working
  - As evidenced by the downward trend in GPCD
- Staff will continue to monitor program effectiveness and make adjustments as needed

# Appendix

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- **Indoor Plumbing Audits**
- **Minor Plumbing Repair/Replacement Program Highlights**
- **Dallas Environmental Education Initiative**
- **Supplement to 2005 Annual Water Conservation Annual Report Briefing**

# Indoor Plumbing Audits

## Facilities Surveyed:

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Dallas City Hall	1500 Marilla
Dallas Zoo	727 E. Ewing
Dallas Theater Center	3636 Turtle Creek
Dallas Museum of Natural History	3535 Grand
Fire Station Number 10	4451 Frankford Rd
Fire Station Number 18	660 N. Griffin
Fire Station Number 28	8701 Greenville
Fire Station Number 30	1138 Zodiac
Dallas Central Library	1515 Young St.
Skyline Library	6006 Everglade Rd
Lakewood Library	6121 Worth St.
Martin Luther King, Jr. Multi-purpose Center	2922 MKL, Jr. Blvd
Juanita J. Craft Multi-purpose Center	4500 Spring
Jaycee Zaragosa Recreation Center	3114 Clymer St
Walnut Hill Recreation Center	10011 Midway Rd
Thurgood Marshall Recreation Center	5150 Mark Trail Way
Marcus Recreation Center	3003 Northaven Rd
DWU Material Services Warehouse	2900 Municipal
NE Water Services Building	8915 Adlora
SE Police Operations Center	725 Jim Miller Rd



City of Dallas

# Dallas Environmental Education Initiative (EEI)

## Program Statistics

Grade	Number of Lessons	Name of School	Number of Students	Water Lessons	Recycling Lessons
Kindergarten	2	Lorenzo DeZavala Elementary	67	0	2
2nd	3	Ronal McNair	114	5	0
6 <sup>th</sup>	3	John J. Pershing	66	3	0
Kindergarten	2	John J. Pershing	41	0	2
Kindergarten	1	J.W. Ray Learning Center	30	1	0
<b>Total</b>	<b>11</b>	<b>4</b>	<b>318</b>	<b>9</b>	<b>4</b>

## Minor Plumbing Repair/Replacement Program Highlights

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Five-Year Strategic Plan (adopted April 13, 2005) recommended the design and implementation of a pilot-scale toilet, showerhead and faucet aerator replacement program specifically targeting low income and senior citizens customers.

### Major Program Talking Points

- Low income and senior citizen water customers are less inclined to participate in these programs as marketed to the general population.
- City is partnering with nonprofit community partners that help administer the program by identifying and qualifying potential applicants. Some portion of funds (CDBG) require that applicants be 62 years of age or older.
- Applicants qualify based on home ownership, current DWU customer, and household income level, specifically fifty percent of area median household income.
- Currently working with three non-profit partners: Shared Housing, Inc., La Voz del Anciano, and Alameda Heights Community Center. The list of partners will expand once the pilot phase is complete. The nonprofits are paid a \$25 administrative fee for each household they process that qualifies.
- For increased efficiency, the program has been combined with the Volunteers in Plumbing (VIP) program that served to repair minor leaks for low-income and senior citizens. The VIP program has been serving this target group since 1992.
- Process involves pre- and post-repair inspection by City inspector.
- \$180,000 allocated for program (plus \$20,000 CDBG funds).

### Program Accomplishments Since November 2005

- 110 applications received
- 45 jobs completed
- Average income is \$12,000 per household
- Large number of leaks have been repaired in each home
- Average amount spent in each household has been \$550
- Expect to repair around 300 households by end of fiscal year

Based on AWWA estimates, the projected water savings for 300 households may be as high as 5.5 million gallons per year. Participants' accounts will be monitored and actual water savings will be computed by comparing before and after consumption amounts.

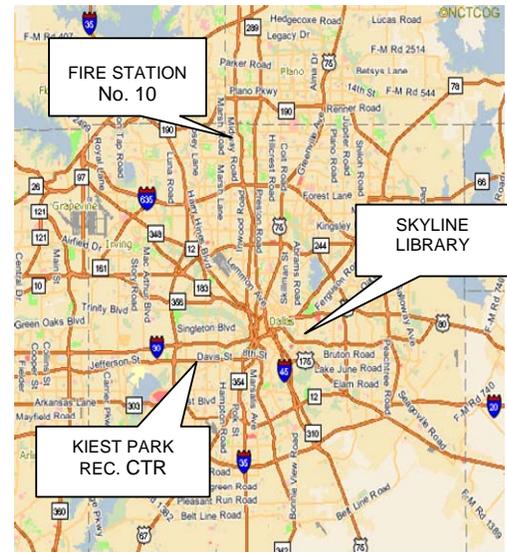
# Supplement to 2005 Water Conservation Annual Report Briefing

## Strategic Plan Year-1 Activities

### CITY LEADERSHIP AND COMMITMENT ACTIVITIES

#### Performed detailed irrigation audits and prepared preliminary recommendations for water-wise plantings at City-owned facilities

The Strategic Plan recommended converting appropriate sections of City-owned landscapes to “water-wise” landscapes and retrofitting City-owned irrigation areas with high efficiency sprinkler heads and weather sensitive irrigation controller technology. As the initial step in this recommendation, detailed landscape surveys and irrigation audits were performed at three City of Dallas facilities: Fire Station No. 10 (4451 Frankford Road); Kiest Park (3080 S. Hampton Road); and Skyline Branch Library (6006 Everglade Road).



## Findings

The irrigation audits determined that:

- Frequently, the amount of water irrigated did not match the actual needs of the plants. Turf and landscape plants were often over-watered or under-watered.
- The automatic controller was disabled at Kiest Ball Fields and irrigation scheduling was being performed manually. The turf water needs were not being met and lawn health was poor at this location.
- Sprinkler runtime settings at two of the sites were not compatible with the clay soils at the sites. This caused water waste through runoff which could potentially be a violation of the irrigation ordinance. Rain and freeze sensors were not in working order at two of the three sites.
- The irrigation controller was not readily accessible at Skyline Library. It was difficult to make adjustments necessary for efficient operation.
- Spray zones at two sites were being operated at very high pressures. This results in over-watering (with runoff), fine mists and water loss through drift from the irrigation zone. Pressure regulators or flow controls should be installed to correct this condition.
- Some of the rotors did not meet the state minimum precipitation rate.
- Spacing between heads at one site was too great, resulting in inadequate water coverage across the zones.
- Irrigation upgrades and landscape conversions could potentially save up to 1.6 million gallons of water per year.

## **Recommendations**

The irrigation audits resulted in a recommendation that weather sensitive ET (evapotranspiration) controllers or soil moisture sensor controllers be installed at each site. In addition, the system upgrades identified by the audits for each site should be performed. Installation of this equipment will result in less water waste and lower overall water use at two of the sites (Fire Station No. 10 and Skyline Library). The turf water needs at Kiest Ball Parks were not being met; therefore, installation of the equipment at this site would result in more water use if improvement of turf grass health is desired.

The landscaping surveys found that there were opportunities for replacing medium to high water use plants with low water use plants at each site. This can be performed in a manner that is aesthetically pleasing and functional. A preliminary plan was prepared for each of the three sites. The plan included a conceptual layout of the low water use plantings; identification of the recommended plant species; other modifications to the site (i.e. irrigation system upgrades) and a planning level opinion of cost for the landscape upgrades. Water savings of up to 50% were estimated for the conceptual plans based on meeting plant water needs.

Based on the irrigation and landscape audits, it is recommended that:

- Irrigation upgrades be performed at the three sites audited,
- Conversion of the landscape at the three sites surveyed to water-wise landscapes,
- DWU should coordinate with Parks and Recreation and EBS and continue performing irrigation audits at other City sites for the duration of the five-year plan,
- High water use sites should be prioritized first (such as parks, road medians, ball fields, etc), and
- Parks and Recreation and Dallas Water Conservation staff should select a facility (or facilities) to retrofit as a premier Xeriscape demonstration site(s). The site(s) should have no restrictions to public access (e.g., a library) and be situated such that it offers significant exposure to the public (high traffic facility).

This work will not only lower outdoor water use at City facilities, but also provide opportunities for raising public awareness on how to save water used outdoors.

### *Performed a survey of indoor plumbing fixtures at City-owned facilities*

One of the Strategic Plan's recommended goals designed to demonstrate the City's leadership and commitment to water conservation is the replacement of high water use indoor plumbing fixtures at City-owned facilities. As part of the initial activities associated with this effort, a survey was conducted that included an audit of 381 toilets, 129 urinals, 352 lavatory faucets, and 52 showerheads located at 20 City facilities. These facilities included City Hall, Dallas Zoo, Dallas Theater Center, Dallas Museum of Natural History, 4 fire stations (#10, #18, #28 and #30), 3 libraries (Central, Skyline and Lakewood), 2 multi-use facilities (MLK and Juanita Craft), 4 recreation centers (Jaycee Zaragoza, Walnut Hill, Thurgood Marshall and

Marcus), 2 water department facilities (Material Services Warehouse and NE Water Building) and the Southeast Police Operations Center.

### **Findings**

Of the fixtures surveyed, approximately 90% of the toilets, urinals and faucet aerators were found to be water-efficient models. However, showerheads installed at the City facilities were predominately high flow (>2.5 gallons per minute) models. Because most of the existing fixtures are presently water-efficient models, it would require less than \$50,000 to fully upgrade the buildings that have been surveyed. Based on research conducted by the American Water Works Association (AWWA), replacement of these fixtures could yield water savings up to 620,000 gallons per year.

### **Recommendations**

It is recommended that the fixtures identified during the Year-1 audit be replaced during Year-2 as part of the long term commitment to upgrading City facilities. This work will also contribute to lowering overall water use and will provide opportunities to raise public awareness of water saving measures. Activities include: surveying indoor plumbing fixtures at selected city buildings, and upgrading the buildings surveyed in Years-1 and -2.

### **Re-organized and Analyzed DWU Water Use Data**

Accurate and reliable water use data are essential for proper implementation and operation of water conservation efforts. These data will be used in a multitude of ways; from tracking and measuring the effectiveness of individual programs to identifying new opportunities to save water. Efforts were undertaken during Year-1 to better understand the existing data collection, storage and extraction process, as well as continued analysis of water use from individual accounts and groups of accounts.

### **Findings**

An analysis of the water use data focused on identifying and better understanding the top water users for each account type. It was determined that the top 10 percent of water users by account classification (single-family residential, multi-family residential, commercial, and industrial) revealed that they use the following percentages in their classification:

- 34% of single-family residential water use
- 56% of multi-family residential water use
- 74% of commercial water use, and
- 94% of industrial water use.

Because some commercial and industrial customers are involved in water intensive processes, DWU works with them on an ongoing basis to find ways to conserve. Additional and more detailed study will be conducted to identify ways to improve conservation with those two groups. Single- and multi-family residential use, on the other hand, readily reveals opportunities to target the top 10 percent residential water users for ways to reduce consumption. This is especially evident

when considering that residential use represents 62% of total Dallas water consumption.

### **Recommendations**

A pilot-scale residential customer audit program should be planned and designed to target the largest (top 100) residential water users.

The Conservation Analyst that will be brought on during year-2 should work with CIS personnel to resolve outstanding CIABS data extraction issues, to ensure that the resulting data set is reliable, and to design a process and schedule for extracting and storing the data on an annual basis.

DWU should record and analyze data generated by the pilot scale Minor Plumbing Repair/Replacement Program and after implementation, the Single-family and Multi-family toilet replacement pilot program. Top water users in each premise type code should be identified and methods investigated for reducing water use at these locations. Opportunities to maximize the effectiveness of the water conservation program should be examined. Work will be performed by the technical consultant and the water conservation analyst.

In addition, specific, ongoing data collection and recording tasks to be used in measuring actual water savings for the Minor Plumbing Repair/Replacement program is recommended. This methodology can be emulated to measure future programs as they are brought on line. General recommendations relating to recordkeeping include:

- Revise the current information system (CIABS) data extraction program to address known errors.
- Using the data extraction routine, begin keeping a *permanent* record of monthly water use for each customer (account/meter combination). At least three years of customer metered water use data should be kept as active files. Historical (non-active) customer water use data should be archived in a format that is readily accessible (i.e., Microsoft Access® file format) for future analysis and system planning studies.
- Record a description of conservation programs, including design, purpose, start and end dates, water savings (estimated or calculated through metered water use) and how the program was implemented.
- To the extent possible, record accounts that have been impacted by each individual conservation program.
- Record annual DWU spending for each individual conservation program and for the DWU conservation program as a whole. Costs for leak detection and repair as well as ongoing system water loss auditing and maintenance should also be tracked.

Additional recommendations made by the consultants are currently and will continue to be performed by the Water Planning and Financial Planning Divisions. This information will be vital for accurate reporting of various conservation data:

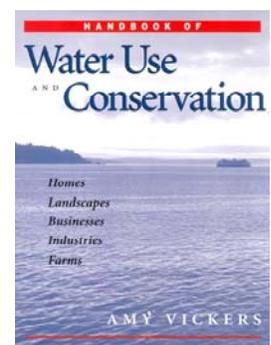
- Record the water rate structure (unit water prices) each year. Also include other items that appear on the water bill (e.g., sewer and/or garbage fees) since these affect the perceived water price.
- Record an annual consumer price index for normalizing water prices.
- Record monthly climate data. Data may include median high temperature, heating degree days, and precipitation at Dallas Love Field and Dallas Executive Airport, and evapotranspiration at the Irving Station of the Texas Evapotranspiration Network.
- Record estimated population data by census block and NCTCOG forecast district, as data are available.
- Record monthly system leakage, water losses, and other relevant indicators in the International Water Association reporting format used by the Texas Water Development Board.
- Annual meter inventory accuracy information, such as numbers of meters tested and replaced, known accuracy and meter sizing issues, and missing customer data should also be recorded.

*Increased Involvement in Professional Organizations at Local, State and National Levels*

As the City incorporates a systematic approach to implementing conservation initiatives, there has been an increased level of interest from other water providers not only within our own region but also at the state and national levels. Just as Dallas has examined other cities and their conservation efforts for ideas on effective programming, others have expressed an interest in learning more about what Dallas is doing. As a result, conservation staff continues to share and receive information from other water providers. In addition, staff has made a number of presentations touting the City's efforts at events such as the 2005 American Water Works Association (AWWA) National Water Conservation Conference held in Savannah, Georgia. The City also hosted the Texas AWWA water conservation workshop in January 2006 at which over 65 attended from throughout the state and region. Staff also continues to be actively involved in the Texas AWWA Conservation and Reuse Committee. Through its involvement in these efforts, Dallas is emerging as a leader in the conservation arena, particularly in the north Texas area.

*Provided Water Conservation Seminar for Customer Cities and Other Neighboring Cities*

In August 2005, DWU hosted a water conservation forum for the customer cities and other regional entities featuring nationally known water conservation expert Amy Vickers. Ms. Vickers presented information relating to new initiatives in conservation, success stories from around the country, and discussed challenges faced by municipalities that are implementing conservation programs. Over 40 representatives attended from throughout the region.



## EDUCATION AND OUTREACH

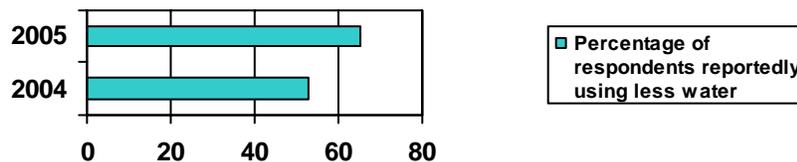
### Continued Outreach Activities

DWU sent out water bill inserts to customers 5 months of the year, and held annual Xeriscape Tour of Homes and two Xeriscape seminars, with about 2,100 participants. Conservation Division staff held several speaking engagements at garden clubs, professional organizations, radio interviews, TV appearances, school presentations and town hall meetings. Estimated direct contact through these speaking engagements was 88,011 people. Nearly 750 children participated in the annual Drinking Water Week poster contest.

### Continued Public Awareness Program

DWU Conservation Division continued the multimedia public awareness campaign which included:

- Print ads, billboards, television, and radio spots which generated 163,491,771 media hits
- Media relations efforts earned 53,928,325 media hits
- Enhancement and re-launch of the conservation website. Website recorded 24,000 hits
- Telephone survey of 500 participants to gauge campaign effectiveness



The telephone survey demonstrated that while major Fortune 500 companies like Coke, McDonald's and Ford spend tens of millions of dollars on advertising to maintain their brand and promote their products in the local D/FW market every year, the City of Dallas Water Utilities water conservation program has been able to build and maintain a very strong awareness level (in the mid-60 percent range) of summer water requirements. Even more impressive is that more DWU customers reported that they have changed their water use habits in the last year (from 53% to 69%).

### Contracted with an Educational Consultant to Develop a Structured Program Curriculum for Grades K-12

DWU collaborated with the Department of Sanitation Services (DSS) to develop the Environmental Education Initiative (EEI) Program with assistance from an educational consultant. This program was developed in the fall of 2005 and implementation in the schools began in January 2006. The program involves teaching conservation and recycling lessons to students from grades K through 5 during the first year of the program implementation. The program will be phased into the middle school classes in school year 2006-07 and high schools will be phased in during the 2007-08 school year.

### Water Conservation Mascot Election

In the fall of 2005, an election was held during which students voted on one of three mascots for the conservation effort geared towards elementary school children. The inauguration and introduction of the new mascot, “Dew,” was held in March 2006.



### REBATES AND INCENTIVE PROGRAMS

#### Rain/Freeze Sensor Rebate Program

The rain and freeze sensor rebate program was implemented in July 2004 and ended on December 31, 2004. The conservation ordinance requires that all automatic irrigation systems be equipped with rain and freeze sensors as of January 1, 2005. Consequently, this program was a one-time effort designed to remind citizens of this requirement and to encourage compliance. During this period, Conservation staff processed over 9,500 applications.

#### Minor Plumbing Repair/Replacement Program (Pilot Phase)

Studies have shown that toilets represent the single largest consumption of domestic water in a typical residential setting. Many water conservation programs focus on replacing older 3 to 5 gallon per flush (gpf) toilets with new 1.6 (gpf) models through rebates and other incentives. An examination of toilet rebate programs in other cities has revealed that low income water customers are less inclined to participate in these programs as marketed to the general population. Invariably, additional efforts should be undertaken to ensure full program saturation. A recommendation was made in the Strategic Plan to design and implement a pilot-scale toilet, showerhead and faucet aerator replacement program specifically targeting low income and senior citizen water customers prior to the launch of a general market program.

During the development phase, two distinctive elements were incorporated into the program. First, the City partnered with local nonprofit agencies that serve the target population to help market the program. Presently DWU is working with three non-profit partners: Shared Housing, Inc., La Voz del Anciano, and Alameda Heights Community Center. The list of partners will expand once the pilot phase is complete. This approach is designed to foster a spirit of inclusiveness and encourage participation while providing administrative assistance to conservation staff. The nonprofits are paid a \$25 administrative fee for each qualifying household they process.

Secondly, in an effort to increase efficiency, the program was combined with the existing Volunteers in Plumbing (VIP) program. The VIP program has helped low-income senior citizens with minor leak repairs since 1992. Leak repair programs have proven to be very cost effective throughout the country in terms of long-term water savings. By combining these programs, we expect to save on administrative

costs and are able to utilize the same plumbing contractor for both functions. The plumber installs the new toilets (up to two per household), showerheads and faucet aerators and if necessary, repairs any minor water leaks.

Program accomplishments since November 2005:

- 110 applications processed
- 45 jobs completed
- Average income is \$12,000 per household
- Large number of leaks have been repaired in each home
- Average amount spent in each household has been \$550
- Expect to repair round 300 households by end of fiscal year

Based on AWWA estimates, the projected water savings from the repairs and fixture replacements for the pilot program may be as high as 5.5 million gallons per year. Individual accounts of participants will be monitored and actual water savings will be computed by comparing before and after consumption amounts. The results will be included in the 2006 Annual Report.

### **Recommendation**

At the conclusion of the current pilot program, staff should refine the Minor Plumbing Repair/Replacement Program as needed. Opportunities should be explored to further collaborate with other City departments (i.e., Housing) to increase efficiencies.

### **Single Family & Multi-Family Residential Toilet Upgrade Program (Planning Phase)**

The conservation staff is currently reviewing a comparison of various single- and multi-family toilet retrofit program models to be offered to the general public. The program is being offered to encourage participation by providing a monetary incentive to the customer and is slated for design and implementation during Year-2 as a pilot scale program. The program will be designed to promote the replacement of older, high volume toilets with new, water-efficient models. As with the Low Income Leak Repair and Fixture Replacement Program, actual water savings from participant accounts will be monitored.

### **Recommendation**

Based on the ongoing analysis of model toilet replacement programs, a program should be designed and implemented late in Year-2 for single- and multifamily residential toilet upgrades. This pilot program should target housing constructed prior to 1993 and/or with high density (people per housing unit).

ADDITIONAL ACTIVITY NOT LISTED IN STRATEGIC PLAN

### **Recycled Water Implementation Plan**

In 2005, Dallas completed a study titled "Recycled Water Implementation Plan Volume I" that details a plan to implement the use of highly treated wastewater effluent to replace the current use of potable water for a number of purposes. These include irrigation of golf courses, industrial processes, commercial

applications, and cooling system applications. This plan is the first step in looking at the future potential of water recycling and exploring ways to conserve our water supplies for the most effective uses.

In 2005, City of Dallas Water Utilities initiated water recycling by completing a pipeline and delivery system to provide highly treated wastewater effluent from its Central Wastewater Treatment Plant directly to the Cedar Crest Golf Course to be used for irrigation. The facility began receiving recycled water in June of 2004. The Cedar Crest Golf Course had recently completed a renovation including a new irrigation system. During 2005, the golf course was watered with recycled water totaling 81.7 million gallons. Because of this, 81.7 million gallons of potable water was made available for other users. As this system grows, Dallas will be able to conserve larger quantities of its potable water supply for its customers while lowering its per capita consumption and extending the life of its existing water supplies.

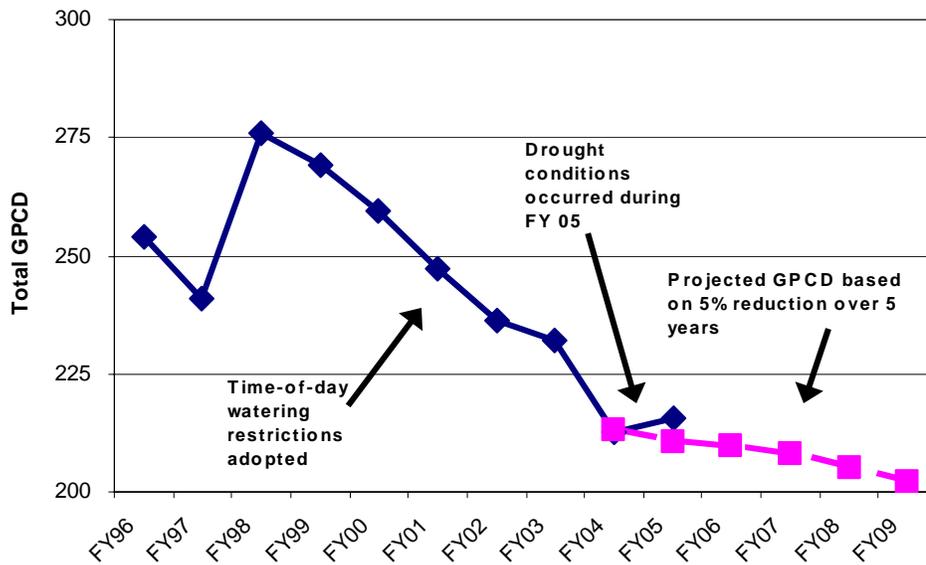
### Assessment

Significant progress in the implementation of the Five-Year Strategic Plan on Water Conservation was achieved during Year-1. Each of the activities scheduled for Year-1 were accomplished on time and within the established budget. The exception to this was the implementation of the Rain and Freeze Sensor Rebate Program for which funds were added as an increased need was realized. Additionally, the Water Conservation Division has continued to monitor technology developments in the field of water conservation to assess whether changes should be made to proposed activities. Based on information developed during the initial year of implementation and technology developments, it is appropriate to continue implementing the water conservation activities and practices as recommended in the Strategic Plan.

The goals for reduction of an average 1% in GPCD per year are established in the Strategic Plan based on an average reduction over a five-year period. During the initial years, the activities recommended by the Strategic Plan are focused primarily on designing and implementing individual water conservation programs. Typically, these programs are implemented on a pilot scale and after one or two years, are expanded into much larger programs. Because the actions undertaken by the Conservation Division during the initial years are focused on the design and start-up of small-scale programs, quantifiable reductions in water use may not be evident until a number of these programs are active and expanded to larger-scale programs.

The City has experienced very positive results since the adoption of the water conservation ordinance relating to lawn and landscape irrigation. Figure 1 shows actual GPCD through 2005. For the first time in five years, GPCD actually went up from 2004 and can be directly attributed to the current drought situation. This increase will be reviewed in relation to actual GPCD for the next several years in order to evaluate the significance of this increase in its proper context.

Figure 1



The approach being used to implement the Strategic Plan by a team effort between the City of Dallas and its consultant has been effective and efficient. This approach allows the Water Conservation Division to add staff at a controlled rate in order to match the staffing level with the activities best performed by in-house personnel. At the same time it capitalizes on the experience and capabilities of the consultants and on the availability of personnel to provide the necessary support.

## Conclusion

The City of Dallas Water Utilities has made a long-term commitment to water conservation and recognizes that the projected population growth cannot be sustained without a reduction in per capita water use. Water conservation will not only extend limited water supplies, but have the added benefit of deferring costly infrastructure and future water development projects. Additional direct and indirect benefits identified with reduced consumption include:

- o Savings in energy use
- o Savings in chemicals
- o Reduction in labor costs
- o Delayed capital Expansion
- o Raw Water Costs
- o Contract/Permit Limits
- o Political – Delayed major bond issue
- o Environmental – Air Quality
- o Environmental – In stream flows
- o Benefit to customer
- o Reduced drought rationing danger
- o Good PR

Overall, the City of Dallas water conservation effort proceeds on schedule and with positive measurable results. We look forward to continued implementation of the

initiatives recommended in the Five-Year Strategic Plan and fully expect to reach, if not exceed, the projected 1% reduction per year for the first five years of the plan.