

## EXECUTIVE SUMMARY

### ES.1 Introduction

The Year 2000 Update to the City of Dallas Long-Range Water Supply Plan identified that additional water supplies will be needed to satisfy projected growth and recommended that aggressive water conservation measures be implemented and funded to reduce per capita consumption and water demand. Recent water conservation efforts by Dallas have focused on a conservation-related ordinance and a multi-media campaign to increase public awareness of water conservation. In 2004, Dallas expanded its public awareness campaign to include several technical studies and the development of a Five-Year Strategic Plan on Water Conservation.

**The Five-Year Strategic Plan on Water Conservation defines water conservation goals for Fiscal Years (FY) 2005 through 2009 and presents recommended measures and budgetary efforts to achieve these goals.**

### ES.2 Strategic Plan Process

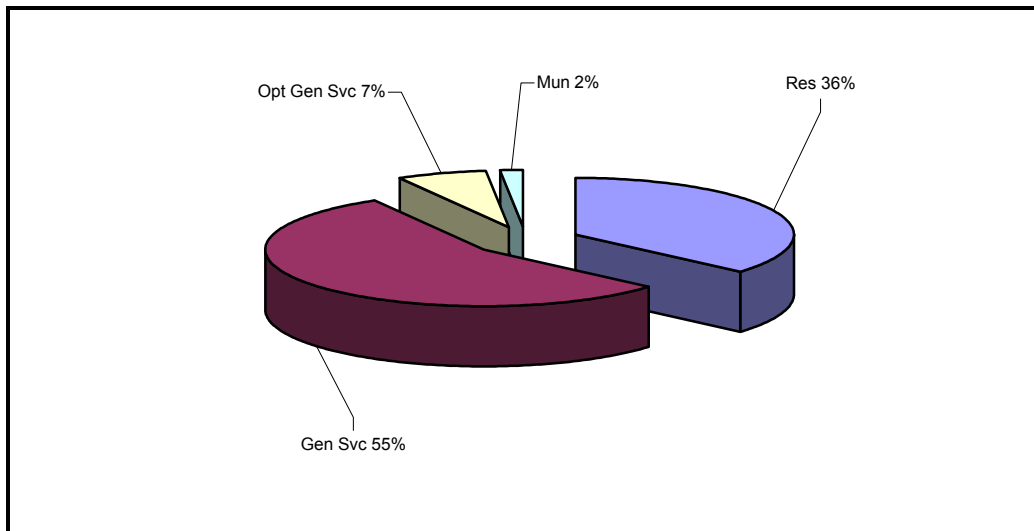
The Five-Year Strategic Plan on Water Conservation (Strategic Plan) was developed through a multi-faceted approach that included review of numerous water conservation programs, initiatives, data, literature, and state regulations, as well as input from the City of Dallas water department (Dallas Water Utilities) staff, water conservation staff from other cities, City of Dallas wholesale customer cities, and water user stakeholders. Development of the Strategic Plan was also coordinated with other ongoing water conservation planning efforts, including the efforts of the Water Conservation Implementation Task Force (created by the Texas Legislature in 2003 pursuant to Senate Bill 1094) and the Region C Water Planning Group. City of Dallas data were examined to identify strategic areas to target. Numerous water conservation strategies were evaluated using a cost-benefit analysis, as well as other means, to determine their feasibility during the five-year planning period. Water conservation goals were established, and recommended strategies were constructed into a framework plan and presented to customer cities, stakeholder groups and Dallas Water Utilities (DWU) for comment. Feedback was analyzed and used to develop a workable draft plan. The draft plan was made available for public review and comment. Public comments were received and evaluated by the consultant and DWU and used to finalize the Strategic Plan.

### ES.3 City of Dallas Water Profile

Available information about the present and anticipated capacity of Dallas' water supply, treatment, and distribution system, as well as population and water supply/demand forecasts were reviewed as part of the planning process. The Draft 2005 Update to the City of Dallas Long Range Water Supply Plan (March 30, 2005) projected sustained growth by the City of Dallas and rapid growth for much of its service area through the 2060-planning horizon. The Draft 2005 Update to the Long Range Water Supply Plan (March 30, 2005) also projected a sustained increase in water demand that is reflective of the long-term population projections.

An understanding of the customer make-up and water-use patterns of the DWU service area was necessary to develop the recommendations contained in the Strategic Plan. Water use data were provided by DWU to develop an initial water-use profile for the City of Dallas. Presently, DWU separates City of Dallas water customers into four general account classifications: Residential, General Service, Optional General Service, and Municipal. The Residential account classification includes single-family residences, individually and master-metered duplexes, individually metered apartments, and individually metered mobile homes. The General Service account classification includes master-metered multi-family housing, master-metered apartments, master-metered mobile homes, office buildings, restaurants, hotels, churches, and industrial customers. The Optional General Service account classification mainly consists of large industrial customers, but the data provided by DWU for several years also includes some master-metered apartment complexes. The Municipal account classification consists of city buildings, parks, fire stations, libraries, and some hospitals.

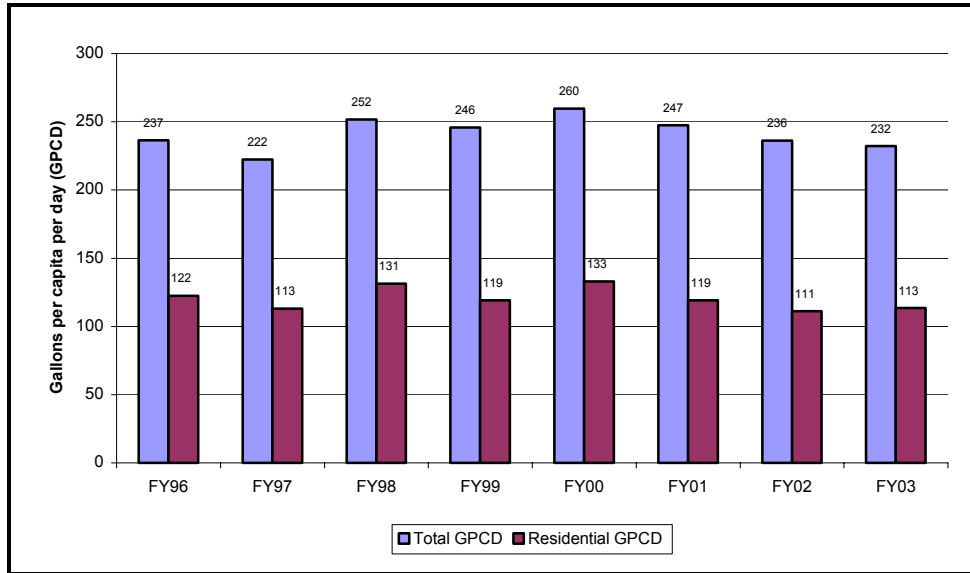
During FY 2003, DWU provided over 79.8 billion gallons of water to approximately 284,000 City of Dallas water accounts. Except for the Municipal account classification, the percent of total water usage by account classification does not mirror the percent of total customer accounts by account classification. For instance, water use during FY 2003 for the General Service account classification was 59 percent of the total water use. However, the General Service classifications accounted for only 14 percent of all water customer accounts. The Residential classification represented 32 percent of total water use, but over 85 percent of all water accounts. The Optional General Service classification used 8 percent of total water in FY 2003, with less than one percent of the customer accounts. The Municipal classification uses less than one percent of total water and represents about one percent of the customer accounts. Figure ES-1 depicts the average water use by DWU account classification for the 8-year period, FY 1996 through FY 2003.



**FIGURE ES-1**  
**Average Water Use by Account Classification FY 1996 – FY 2003**

In its Special Report to the 79<sup>th</sup> Legislature, the Water Conservation Implementation Task Force recommended standard methodologies for calculating total gallons per capita per day

(gpcd) and residential gpcd. Using this methodology, total gpcd (which includes unbilled treated water) for the City of Dallas ranged from 222 to 260 gpcd for the period FY 1996 through FY 2003. Residential (single-family plus multi-family) gpcd for the same period averaged 120 gpcd. The remaining 102 to 140 gpcd is attributed to industrial, commercial, institutional, and municipal use. Figure ES-2 depicts this comparison on a year-by-year basis for the eight year period, FY 1996 through FY 2003.



**FIGURE ES-2**  
**City of Dallas Total and Residential GPCD**

Seasonal use patterns were examined for residential and large industrial and commercial customers to determine peak seasonal use patterns. For the period FY 1988 through FY 2003, the summer to winter water use ratio was used as an indicator of seasonal peak demands. Comparison of summer to winter water use also provides an estimate of outdoor use. For residential water users, the summer to winter ratio averaged approximately 2.0 for FY 1988 through FY 2003. Summer to winter ratios for large industrial and commercial customers averaged 1.2, but varied significantly by business type, with a range of 0.6 to more than 13. Inspection of individual accounts was necessary to determine likely outdoor use by industrial and commercial customers.

#### **ES.4 Water Conservation Strategies Examined**

Numerous water conservation strategies were examined and considered during the strategic planning process. These strategies were derived from several resources, including state agency directives, regional water planning groups, water conservation literature, stakeholder feedback, water conservation programs used by other municipalities, and the city’s existing water conservation plan.

The Texas Water Development Board Report 362, *Water Conservation Best Management Practices Guide*, contains 58 Best Management Practices (BMPs) divided into three general areas: municipal, industrial, and agricultural. Each BMP listed in the Guide was evaluated to determine its applicability to the Strategic Plan.

Several cities were interviewed that provide diverse conservation programs for single-family residential, multi-family residential, commercial, and industrial customers. These cities included Austin, Texas; Denver, Colorado; El Paso, Texas; Las Vegas, Nevada; Orange County, California; San Antonio, Texas; San Diego, California (Otay Water District); Seattle, Washington; and Tampa Bay, Florida. The Orange County and Tampa Bay programs are wholesale agencies that assist purveyors who serve retail customers. The remaining interviewees serve a predominantly retail customer base. Conservation programs from other cities were also studied, but detailed interviews were not conducted. Conservation practices and incentives utilized by these cities were evaluated for inclusion in the Strategic Plan.

Water conservation strategies currently employed by DWU include the following:

- Water conservation staff
- Universal meter testing, repair, and replacement
- Leak detection, repair, and control of unaccounted-for water
- Public awareness and education program
- Non-promotional water rate structure
- Reservoir systems operations plan
- Means of implementation and enforcement of water conservation ordinances
- Lawn and landscape irrigation ordinance
- Coordination with regional water planning groups
- Record management system
- Recycled water implementation strategy
- Adoption of updated plumbing code
- Distribution system pressure control program
- Financial incentives (rain-freeze sensor – rebate discontinued January 1, 2005)
- Demonstration sites (e.g., Fair Park Program)

### **ES.5 Water Conservation Strategy Evaluation**

Water conservation strategies identified from the resources were compiled into a list as candidate strategies. Each strategy was researched and evaluated in order to determine if it should be recommended for implementation during the five-year planning period. The

evaluation included an initial screening of the strategies to determine their applicability for use by Dallas, based on the city’s water use profile. Strategies passing the initial screening were subjected to a benefit-cost analysis and weighed against feedback from customer cities, stakeholder groups, and DWU. A final list of recommended strategies was developed and incorporated into the Strategic Plan.

### ES.6 Recommended Water Conservation Strategies

The water conservation strategies presently employed by DWU are recommended for continuation or enhancement under the Strategic Plan. Conservation strategies not presently used by DWU that are recommended for implementation during the five-year planning horizon are shown in Table ES-1. Other conservation strategies are also identified in Table ES-1 that are not recommended for implementation during the initial five-year period, but should be considered for possible implementation after FY 2009, based upon conditions at that time.

<b>TABLE ES-1 Recommended Water Conservation Strategies</b>		
<b>Water Conservation Strategy</b>	<b>Recommended during FY 2005-FY 2009</b>	<b>Recommended for consideration after FY 2009</b>
Existing DWU water conservation strategies	Yes	Yes
Showerhead, aerator and toilet flapper retrofits	Yes	Yes
Toilet replacement program	Yes	Yes
Residential clothes washer incentive program	Yes	Yes <sup>1</sup>
Water surveys for SF and MF customers	Yes	Yes
Landscape irrigation incentives	Yes <sup>4</sup>	Yes
Water wise landscape design program	Yes	Yes
Athletic and golf course conservation	Yes	Yes
Wholesale customer assistance program	Yes	Yes
Rainwater harvesting	No	Yes <sup>1</sup>
New construction graywater	No	Yes <sup>1</sup>
Park conservation	Yes	Yes
ICI program <sup>3</sup>	Yes	Yes
Rinsing and cleaning conservation	Yes (food service industry)	Yes (ICI program)
Retrofitting existing connections with individual meters	Yes <sup>2</sup>	Yes <sup>2</sup>
Residential dishwasher incentive	No	Yes <sup>1</sup>

<b>TABLE ES-1 (continued) Recommended Water Conservation Strategies</b>		
<b>Water Conservation Strategy</b>	<b>Recommended during FY 2005-FY 2009</b>	<b>Recommended for consideration after FY 2009</b>
Residential swimming pool	No	Yes <sup>1</sup>
Hot water on demand	No	Yes <sup>1</sup>
Swimming pools and zoos	No	Yes <sup>1</sup>
Recycled water use	Yes	Yes

<sup>1</sup> Presently anticipated to have limited applicability.

<sup>2</sup> Where practicable

<sup>3</sup> Includes industrial water audit, condensate reuse, industrial water waste reduction, industrial submetering, cooling tower and cooling system upgrades, reuse of industrial process water, industrial water treatment, cleaning and sanitation, boiler and steam systems, refrigeration (including chilled water), once-through cooling, commercial clothes washers, ICI management and employee programs, industrial landscape and industrial site specific conservation.

<sup>4</sup> Included in ICI program and rain/freeze sensor rebates for SF, MF and ICI customers.

### **ES.7 Recommended Five-Year Strategic Plan on Water Conservation**

The Strategic Plan is designed to provide the basis for a long-term disciplined approach to water conservation. This approach will reduce the overall consumption of water, reduce the loss and waste of water, broaden the efficient use of water, extend the life of the existing water supply, delay the need for development of costly new water sources, serve as an alternate water supply source to meet future water needs, and address statewide mandates and new initiatives.

Goals established in the Strategic Plan include the following:

- Develop and implement water conservation programs that will:
  - Reduce seasonal peak demands
  - Reduce water loss and waste
  - Decrease per capita water use
  - Maintain quality of life
  - Allow continued economic growth
- Maintain a heightened public awareness of water conservation in Dallas and the surrounding region.
- Include broad-based public and private stakeholder groups in new program development and implementation processes.

- “Lead by example” by upgrading city facilities with water efficient fixtures, landscapes, and irrigation systems wherever possible.
- Facilitate regional conservation efforts among DWU wholesale customer cities and neighboring municipalities.
- Establish a target of an average one percent per year reduction in overall per capita water consumption (total gpcd) for the five-year planning period.
- Establish the foundation for continuation of water savings targets for the following five-year period.

The Strategic Plan is built upon the following major elements:

- City of Dallas Leadership and Commitment,
- Education and Outreach Initiatives, and
- Rebate and Incentive Programs

Each of the three major elements work together to create a balanced program designed to achieve the stated goals. Loss of any of the elements will reduce the program’s effectiveness. Each element contains various water conservation strategies and measures that are set forth in the Strategic Plan, as described below.

*City of Dallas Leadership and Commitment*

The visible efforts and actions of the City of Dallas with respect to its own water use will be the single greatest example of the city’s commitment to water conservation. Positive efforts and actions conducted by the city will impact others and encourage like-mindedness in water conservation, not only by DWU customers, but also with others throughout the region. Specific recommendations for *City of Dallas Leadership and Commitment* include the following:

- Continue to fund personnel and provide resources that are required for continuance of the water conservation program.
- Continue to inspect city facilities and retrofit inefficient plumbing fixtures with low-water use fixtures.
- Convert appropriate sections of city-owned landscapes to water-wise landscapes (begin FY 2005).
- Retrofit city-owned irrigated areas with weather-sensitive irrigation controller technology (begin FY 2005).
- Review and revise existing city ordinances, codes, and standards as necessary to ensure that water-conserving principles are maintained (begin FY 2006). Consider

adoption of new codes and standards that will further advance water conservation (ongoing).

- Improve water conservation code enforcement efforts.
- Further refine the collection and analysis of DWU water use data, and use this data to identify additional strategic areas for water conservation. When additional strategic areas are identified, fund the actions that are recommended, when shown to be cost-effective and appropriate (begin FY 2005).
- Expand the implementation of the recycled water program (begin FY 2006).
- Implement a conservation rate structure that will further reduce discretionary water use (adopt FY 2008 or sooner).

#### *Education and Outreach Initiatives*

The sustainability of an effective water conservation program is directly impacted by the cooperative spirit and active participation of the customers. Absent a continuous program of education, public awareness and outreach, any gains in water conservation will be eroded and over time will be substantially lost. The elements of education and outreach must be continued indefinitely in order to achieve long-term and permanent savings. Specific recommendations for *Education and Outreach Initiatives* include the following:

- Continue to fund the multi-media public awareness campaign (ongoing).
- Continue to fund new and expanded special events to promote water conservation (ongoing).
- Augment the existing school education programs to include a structured English and Spanish K-12 curriculum (begin FY 2005).
- Develop and implement a bilingual customer water audit program (begin FY 2006).
- Create an enhanced website, providing up-to-date information that promotes, encourages, and educates the public on water conservation (begin FY 2005).
- Take a leadership role in promoting a regional approach to water conservation by creating stakeholder committees, task forces, or advisory groups to better define the water conservation message and recruit allies in promoting water conservation (begin FY 2005).
- Continue to work with DWU customer cities and other municipalities on joint water conservation education efforts and encourage them to adopt “like” measures and initiatives as they relate to DWU efforts (ongoing).

#### *Rebate and Incentive Programs*

Throughout the country, rebate and incentive programs have proven to be an effective means of promoting water conservation, generally through modification of equipment, behavioral

activities, or system processes. In general, rebate programs can be divided up by either category of user (residential or industrial, commercial, and institutional, also referred to as ICI) or by where the water savings will occur (indoor or outdoor). The Strategic Plan includes the following specific rebate and incentive recommendations:

- Implement a rain-freeze sensor rebate program (rebate through December 31, 2004).
- Implement a faucet aerator and showerhead retrofit program. It is recommended that these be provided free of charge to DWU customers (begin FY 2005).
- Implement a toilet retrofit program. It is recommended that this program include single-family, multi-family, and ICI customers, and that a special partnership program be developed to focus on low-income and elderly households. The low-income/elderly program is recommended to begin in FY 2005. The single-family and multi-family program is recommended to begin in FY 2006, and the ICI program is recommended to begin in FY 2008.
- Implement an ICI grant program. This program will focus on higher use ICI customers and will include grants as an incentive for installation of both indoor and outdoor water conservation measures. It is recommended that DWU cost-share 50% of upgrades or conversions up to a ceiling established by DWU. The applicant will be required to perform an engineering study to determine the potential amount of water savings. The applicant will be required to keep the conservation devices in service a minimum of ten years. This program is recommended to begin in FY 2007.
- Implement a water-efficient washing machine program. This program will initially be for residential customers (begin FY 2007); then ICI customers will be phased in over the following 24 months.
- Implement a pre-rinse spray nozzle program for commercial restaurants, schools and hospitals. It is recommended that this device be provided free of charge to qualified customers, beginning in FY 2008.

Each rebate and incentive program is recommended to begin as a pilot program, which would then evolve to a full-scale program over one to two years. The programs should include mechanisms for marketing and educating the public of the potential water savings. The financial incentive should encourage customer participation. A means of confirming the installation and tracking the water savings per measure is also recommended. The overall rebate program should be structured such that individual programs can be modified or phased-out as necessary, and new incentive programs be developed and implemented to achieve the overall goals of the Strategic Plan.

Five-year budgetary recommendations were developed for the Strategic Plan to achieve the stated water conservation goals. A summary of the recommended budget and program elements is provided in Table ES-2.

<b>TABLE ES-2</b>					
<b>Proposed Budgets and Targeted Water Savings</b>					
<b>Element</b>	<b>FY 2005</b>	<b>FY 2006</b>	<b>FY 2007</b>	<b>FY 2008</b>	<b>FY 2009</b>
City Leadership and Commitment	\$0.89M	\$1.73M	\$2.31M	\$2.20M	\$2.23M
Education and Outreach	\$1.41M	\$1.49M	\$1.54M	\$1.54M	\$1.54M
Rebates and Incentive Programs	\$0.63M	\$0.31M	\$1.18M	\$2.23M	\$2.84M
Totals	\$2.93M	\$3.23M	\$5.03M	\$5.97M	\$6.61M
Annual Contribution to Total Per Capita Water Savings	1.2%	0.4%	0.8%	1.4%	1.3%
Targeted Cumulative Total Per Capita Water Savings	1.2%	1.6%	2.4%	3.8%	5.1%