

Thirsting for Less:

Water Conservation Progress and Potential in North Central Texas

Researched and Written by Margot Clarke

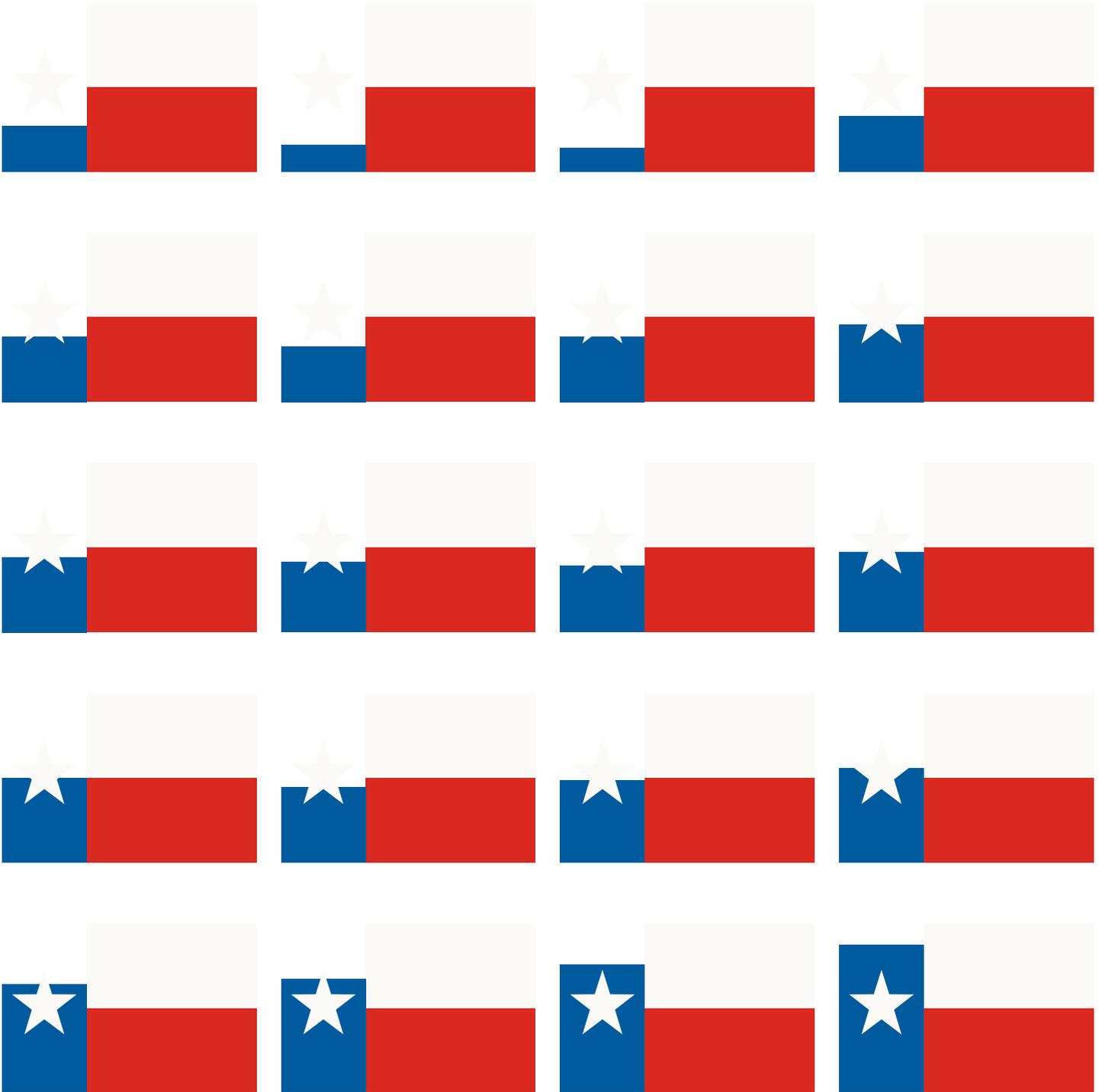


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Executive Summary

Conserving Texas' water through increasing efficiency, reducing waste, and lowering demand is ever more important in our rapidly growing state. Fifteen years ago the Texas Water Development Board and the Texas Legislature began to increase the focus on conservation in the state's water planning process and state water law.

Then, as now, municipal water was the fastest growing water use sector, and North Central Texas was and is a prime example of that trend. With approximately one quarter of the state's population, water use there has impacts beyond the region. The conservation plans and programs in North Central Texas are significant indicators of how water suppliers and users have and will respond to the need to use water more wisely, not only during drought, but on an everyday basis.

In 1997, the Texas Legislature enacted Senate Bill 1 (SB1), changing the state water planning process to use a bottom-up method built on regional plans aggregated into the State Water Plan. SB1 also established new requirements for the consideration of and planning for water conservation for the regions, as well as all entities holding permits for substantial amounts of water. The first state plan with the new format was released in 2002, with the regional plans being completed the year before.

State laws and state, regional, and local water plans all lay out intentions about water use, management, and conservation. This report reviews how, for North Central Texas, those intentions are translating into action on advancing water conservation to meet water needs.

2002 - Baseline

In formulating the first regionally-based state water plan for 2002, all the regional planning groups had been required to include conservation in the water management strategies considered for meeting their regions' needs. Although about two-thirds of the groups identified conservation as a strategy in their plans, the estimated savings were not ambitious.

Water conservation efforts in most areas had been focused on irrigated agriculture. Although municipal water use is growing faster than any other type, while agricultural use is declining, only three of the 11 planning groups that included conservation in their 2001 plans mentioned municipal conservation.

The planning groups were facing a difficult job in projecting 50 years of water use and needs, especially in areas such as North Central Texas, known as "Region C," where population was expanding rapidly. Region C, made up of all or part of 16 counties, contains almost the entire Metroplex; 85 percent of the region's water use is in the Municipal sector, which includes residential, non-industrial commercial, and institutional use of water. The plan had to project water use in that sector based on anticipated population and a water-use metric known as "gpcd," or gallons per capita per day. Several cities in Region C had some of the highest municipal gpcd numbers in the state. According to its plan, the region expected its overall municipal gpcd to increase for at least the next 10 to 20 years.

Region C did project savings from water conservation in the plan, calculating that conservation would reduce by 15 percent the original estimated municipal per capita demand. More than half of that reduction, however,

was due to the increased use over time of newly required low-flow plumbing fixtures.

Another water management strategy, called “reuse,” maximizes the use of an existing supply, rather than developing additional water sources. This strategy uses treated wastewater as a water supply, either directly with effluent from a wastewater plant, or indirectly by returning wastewater to a river and diverting a similar volume downstream. Region C included reuse among the strategies planned to meet the region’s needs, expecting it to be a water source that would cover 34 percent of the projected supply shortfall by 2050.

Planning for and methods of water conservation were not entirely new for water providers, utilities, and agencies, but the general public in many areas did not appear to think much about where their water came from or how much they used. Many regional planning groups, including Region C, did not seem prepared to count on saving water through conservation programs dependent upon consumer behavior. There was uncertainty about how best to tap that source and whether significant amounts of water could result from doing so. This is where North Central Texas was in 2002.

2012 – Conservation in North Central Texas

During the last decade the Legislature has taken additional action on conservation, and more conservation plans and programs have been developed and implemented. The Texas Legislature passed some new laws affecting water planning and management, and established rules and

formats for the conservation plans that were established as a requirement in 1997. The revised plans were due May 1, 2005 and had to:

- Establish 5-year and 10-year targets for quantities of saved water,
- Within those targets, have goals for reducing municipal gpcd,
- And likewise formulate goals for programs addressing water loss.

The legislature also created the Water Conservation Implementation Task Force to assess conservation in the state and develop a best practices guide to assist the planning groups and water providers.

The two state water plans written since 2002 reflected the growing interest in water conservation. The volumes of water planners projected to be made available from conservation to meet the state's needs by 2050 increased from 988,000 acre-feet in the 2002 state plan to 1,896,000 acre-feet in the 2007 plan and 2,024,000 acre-feet in the 2012 plan. These conservation projections, however, include water conservation in the irrigated agriculture sector.

The two North Central Texas water plans written by Region C's planning group for 2006 and 2011 contained much more discussion of water conservation and more focus on water reuse. Despite the additional focus on and planning for water conservation, the expectations for what could be achieved in saving water are relatively unchanged in the five years between the plans. In fact, the projected volumes of conserved water in the region in the later plans are much lower than those in the initial regional plan.

Major Water Suppliers and Conservation

North Central Texas' four largest water suppliers, accounting for close to 60 percent of the region's water volume, are Dallas Water Utilities, Tarrant Regional Water District, North Texas Municipal Water District, and the City of Fort Worth. Being different types of providers – wholesale only, both wholesale and retail, with or without reservoir ownership – there are different conservation actions they can take to save water, though all major suppliers address issues such as water loss and accurate metering.

In 2010, North Texas Municipal Water District, a wholesale supplier, reported that conservation and reuse combined had saved 34.5 percent of the total volume of water produced, with conservation accounting for a third of the savings, more than 11.6 billion gallons. The district's customer cities, however, are under a take-or-pay contract system wherein each city pays for a volume of North Texas water equal to the largest amount it ever used in a year. This is a disincentive for the cities to institute strong conservation programs, except in drought years, as they will be paying for that amount even if they use less.

The Tarrant Regional Water District, another wholesale supplier, in recent years integrated their public awareness water conservation programs with those of the City of Dallas Water Utilities in order to achieve a more consistent message in a larger area. Between 2007 and 2011 the district saved 45.6 billion gallons, nearly 140,000 acre-feet of water, at a cost of less than 10 cents per 1,000 gallons.

The other two top water suppliers in North Central Texas are the cities of Dallas and Fort Worth, whose millions of customers, along with those of the other cities', generate the Municipal water sector demands presented in the

region's water plans. The state Water Conservation Implementation Task Force in 2004 recommended that the overall goal for such municipal use should be 140 gallons per capita per day (gpcd), with an annual reduction of 1 percent of a city's gpcd number until the 140 figure is reached.

Dallas Water Utilities has been implementing some water conservation programs for more than 20 years, but the efforts increased starting in 2001. Since then, Dallas has saved close to an average 45,000 acre-feet per year. Due to the city's current high per capita use, however, Dallas would not reach the recommended goal of 140 gpcd until after 2050, even if the utility had gpcd targets to consistently achieve the one percent reduction.

The City of Fort Worth's water conservation plan has implemented a number of the best management practices guidelines compiled by the state task force in 2004. Although the conservation programs have brought about an increase in public awareness, almost all of the water reported saved in the last two years – a total of more than 6.6 billion gallons – was due to reuse, rather than conservation. The gpcd targets in Fort Worth's conservation plan are in line with the recommended one percent annual reduction, but at that rate the 140 gpcd goal will not be reached until around 2040.

As one of the numerous suburban communities in North Central Texas, Plano is representative of the challenges of reducing demand for water in a rapidly growing metropolitan area. The city is a North Texas Municipal Water District customer and has a take-or-pay contract with the district. Plano's first conservation plan was adopted in 2010, with typical elements of leak detection and repair, landscape rain and freeze sensors, and a public information program. Although the city has tiered water rates, these rates are insufficient to create much incentive to reduce consumption. In addition, Plano's progress in reducing its per capita usage has been minimal in the two

years under the conservation plan. Despite the gpcd target of 225 by 2014, the city's per capita usage in 2010 was 236 gpcd and 241 gpcd in 2011.

Water conservation in North Central Texas has increased and improved in the last ten years. Progress has been neither smooth nor universal, however, and state resources to complement and bolster the efforts of utilities and suppliers have not been forthcoming. Awareness of and policies about conservation are more prominent now than a decade ago. What can we expect of the future?

Future Water Conservation in North Central Texas

Water is a finite resource but essential to life. In Texas, if all the river water already under permit for consumptive use were actually withdrawn, many of the rivers would cease to flow at certain times. Texas is now home to more than 25 million people and some of the largest metropolitan areas in the country. While droughts bring a lot of attention to the need to use water wisely, conserving water is always necessary and prudent, as well as economically and ecologically responsible.

The state water plan is a valuable tool in preparing for future conditions and needs, although the regional plans it is based upon have no incentive to be conservative in their estimates of future water demands. The projected costs of implementing all of the water management strategies in the state plan total an estimated \$53 billion. **Given that water conservation is the cheapest and most available source of water supply, one thing that is needed is a clearly stated, financially supported, first priority in the state water plan to increasing conservation across the state.**

Because there already have been multiple, effective water conservation programs implemented in North Central Texas, some only within the last few years, there is every reason to believe that more conservation will be achieved. But **additional steps should be taken to advance water conservation in North Central Texas through local, regional, and state action so that the full potential of conservation to meet water needs may be achieved. Here are some avenues that are worthy of pursuit:**

- 1) Update and expand adoption of best management practices for municipal water conservation.**
- 2) Establish more aggressive goals and targets for water use reductions in water conservation plans.**
- 3) Implement a well-funded statewide water education campaign and/or a region-wide water education program in North Central Texas.**
- 4) Continue, enhance, and provide State support for regional coordination of water conservation efforts in North Central Texas.**
- 5) Promote consistent water conservation measures in the region through similar municipal ordinances.**
- 6) Consider alternatives to the use of “take-or-pay” contracts for the sale of water from wholesale providers to retail water suppliers.**

The Region C and state water plans and other documents make it clear that in the last decade attention to and achievements of water conservation in North Central Texas have increased significantly. **Many people, including many of those involved in providing water supplies in North Central Texas believe, however, that *significantly more can and should be done to advance water conservation in the region.*** North Central Texas has made progress on water conservation, and certain developments such as the Water Efficiency Network of North Texas have become models for advancing water conservation in other parts of the state. But clearly the potential for achieving greater progress on water conservation in the region exists. A mix of local, state, and regional actions are available to reach that potential, to the benefit of the water future of not only the region, but also the entire state of Texas.

Introduction

Water conservation – making our water resources last longer by wasting less, using water efficiently, and reducing the amounts we go through – is a concept that has become familiar to more and more people as droughts seem to come with increasing frequency and hot spells get hotter in Texas. Although droughts have heightened Texans’ awareness of the preciousness of water, the term “water conservation” as used here actually refers to ongoing efforts to use our existing water supplies wisely, not measures to reduce water use in response to drought situations (although some water conservation and drought response measures may be similar). Landscape watering schedules and restrictions, tiered water rates, xeriscaping, low-flow plumbing fixtures, drip irrigation, even rainwater harvesting: most Texans have heard of one or more of these techniques used to save water. Increasingly some or all of these techniques are being adopted and employed in different areas on a continuous basis, not just during periods of drought.

But even ten years ago, such was not the case. Although consideration of conservation as a water management strategy first appeared in the third state water plan in 1984¹, the idea of saved water as a water supply did not exactly spread like wildfire, especially in the public consciousness. Instead, as the state’s population grew more rapidly, those planning how to supply all the people, farms, and businesses with water were thinking about taking more from rivers and aquifers, and building more dams, reservoirs, and/or pipelines to hold it or move it to the places where they wanted it. Agricultural water use, always the largest in the state, was starting a slow decline, while municipal water (for homes and

¹ Texas Water Development Board, *Water for Texas – 1997*, Chapter 2, p. 2, http://www.twdb.state.tx.us/publications/State_Water_Plan/1997/Ch_2.pdf.

non-industrial businesses) topped the lists of increased water demands and supply concerns in many locations.

A decade ago the North Central Texas region, with Fort Worth and Dallas as its vibrant urban hub, and the astonishing expansion of suburban communities outward in every direction, exemplified most of these water issues. In particular, the demand for municipal water was skyrocketing along with the population, with all projections for the future continuing the trend. The major water suppliers in the area were facing the costly prospect of needing to increase the amount of water they could deliver to their customers, with almost all the easily accessible sources already in use or spoken for. But some changes were on their way, at least as far as state water policy was concerned.

In 1997, Senate Bill 1 (**SB1**) was the most significant piece of legislation on water law to pass in Texas for a dozen years. It revamped the state water planning process, basing it on regional plans developed around the state, and also required water conservation plans from all entities holding permits for substantial amounts of water. In addition, the new water plan would require every region to consider conservation as a means to address supply needs.

Since then, the North Central Texas region has proposed its solutions to supplying the projected water demands for the coming decades in three regional water plans that were incorporated into three respective state water plans. This report will examine the role that water conservation has played in these regional plans and water management activities in the past decade, how attitudes and expectations toward water changed in the region during that time, and how those changes might or might not affect the future of water supplies, demands, and use in the region. In addition, we explore the impact of the laws, plans, and conservation efforts on the water districts and city utilities in North Central Texas charged with obtaining, treating, and delivering hundreds of billions of gallons of fresh water to millions of people every year.

State laws, state water plans, regional plans, and water providers' plans all lay out intentions about water use and management. This report tries to find out how, for North Central Texas, those intentions are working out with regard to advancing water conservation as a means to meeting water needs. The Metroplex area is home to nearly a quarter of the entire state population, and their water use is not only reflective of the fastest growing sector of water demands, it is a case study for a state that officially proclaims in its state water plan that, “In serious drought conditions, Texas does not and will not have enough water to meet the needs of its people, its businesses, and its agricultural enterprises.”²

² Texas Water Development Board, *Water for Texas – 2012*, Executive Summary, p. III, http://www.twdb.state.tx.us/publications/state_water_plan/2012/00.pdf.

Baseline: Conservation Programs in 2002

A decade ago, the first bottom-up, regionally-based process culminated in the 2002 State Water Plan (**SWP**). Mandated by the 1997 Senate Bill 1 (**SB1**), the format of the state plan was changed to incorporate the plans developed by the 16 newly-established Regional Water Planning Groups (**RWPGs**), and it laid out their estimates of what the state's water supplies, demands, and strategies for matching them would be for the next 50 years.

In that plan, **water conservation was one of the water management strategies required by SB1 to be considered by all of the RWPGs**. A water management strategy is defined as “a specific plan to increase water supply or maximize existing supply to meet a specific need.”³ In water planning, a “need” means an identified situation where the projected demand (water use expected in the future) cannot be met with existing supplies. In the opening section of *Water for Texas – 2002*, conservation is called “a very critical element to meeting the State's long-term water needs” and it is included not only as a recommended management strategy, but also as the subject of several of the plan's major policy recommendations to the Legislature.⁴ **In the regional water plans adopted in 2001 to feed into the 2002 state water plan about two-thirds of the RWPGs identified conservation as one of their strategies to cover the region's anticipated water needs.**

Beyond the stated principle of its importance and the name of the management strategy on the regions' pie charts, however, there were

³ Texas Water Development Board (TWDB), *Water for Texas – 2002*, Volume I, p. 69, http://www.twdb.state.tx.us/publications/State_Water_Plan/2002/WaterforTexas2002.pdf

⁴ TWDB, *Water for Texas – 2002*, Volume I, pp. 7-8, http://www.twdb.state.tx.us/publications/State_Water_Plan/2002/WaterforTexas2002.pdf

factors, especially at the regional level, that may have constrained the thinking about water conservation and the estimates of savings that could be achieved from conservation programs and practices during this new form of planning.

One likely factor was the state's historical experience with water. Texas saw a surge of reservoir building in the mid-twentieth century, starting in the 1930s and 1940s, mainly for flood control. The devastating drought of the 1950s provided another impetus and purpose for new reservoirs – water supply. As the state's population grew by 170 percent in the years between 1950 and 2000 – at the same time shifting from nearly equally rural and urban to more than 80 percent urban – the growing number of reservoirs provided a sense that there was adequate water to meet the larger demands. We went from a state with essentially no natural lakes to the state with the most square miles of inland water of all the Lower 48.

The very terminology used by the Texas Water Development Board (**TWDB**) (originally named the Texas Board of Water Engineers) and by water planners about water supplies and reservoirs might account for some confusion about the concept of conserving. The capacity of a reservoir used for water supply is referred to as “conservation storage capacity,” meaning how much water can be taken out and used.⁵ Sometimes “conservation” is said to have been the reason behind building new reservoirs. And when the water plans propose strategies to cover the projected needs, the words almost always refer to “additional” or even “new” water supplies; several of the plans' strategies include new reservoirs.

Also, until recently, increasing the efficiency of use of existing water supplies usually was expected to happen in the irrigated agriculture sector. **Of the 11 RWPGs that**

⁵ Texas Water Development Board, “Hydrographic Survey: Reservoir Terminology,” http://midgewater.twdb.texas.gov/swrweb/swr/hydro/Hydro_Definitions.html

included conservation as a management strategy in their plans in 2001, only three actually mentioned conservation in connection with municipal use, the fastest growing sector in most regions.

Certainly, the RWPGs were tasked with a daunting job, particularly in certain regions with large populations that were growing rapidly. Nowhere was this more true than in the region called “Region C,” made up of all or part of 16 counties in North Central Texas, whose estimated population in 1998 comprised nearly a quarter of the entire state’s. This largest regional population was getting larger quickly. Indeed, in the course of developing the regional plan, TWDB’s population projections were increased for nine of the region’s counties because, for one thing, the counties’ 1998 population already exceeded the projection for 2000.

These new people in Region C were, and are, concentrated in the area’s big cities and expanding suburban communities. The Dallas/Fort Worth Metroplex, almost all of which is within Region C’s boundaries, contains so many of Texas’ largest cities in close proximity that many non-residents tend to think of it as one enormous metropolis. Thus, when looking at a graph of water uses in Region C, one can see that the category accounting for the vast majority (almost 85 percent) of the total is “Municipal.”⁶ (Exhibit 1) The municipal sector includes residential, non-industrial commercial, and institutional use of water, typically for drinking, cleaning, landscaping, and air conditioning. The water planners not only had to build projections for the population growth in the region, they had to estimate how much water those millions of people would be using in each of five decades into the future.

⁶ Texas Water Development Board (TWDB), *Region C Water Plan*, Section 2, following p. 2.14, http://www.twdb.state.tx.us/RWPG/2001_RWP/c/PDFs/Regional%20Plan%20Main%20Text/Section%2002.pdf

While municipal water use is still less than that of agricultural irrigation in the state overall, it is the fastest-growing sector of use by volume; water use for irrigation is declining. The 2002, 2007, and 2012 state water plans all have projected municipal use to equal the amount of irrigation's by sometime in the decade of the 2060s.⁷ In Region C, whose population projections in those plans have ranged from about 24 percent to more than 28 percent of Texas' total, projections of the region's future demand for municipal water bear enormous implications for the state's future as a whole.

⁷ TWDB, *Water for Texas – 2002*, Vol. I, p. 7,

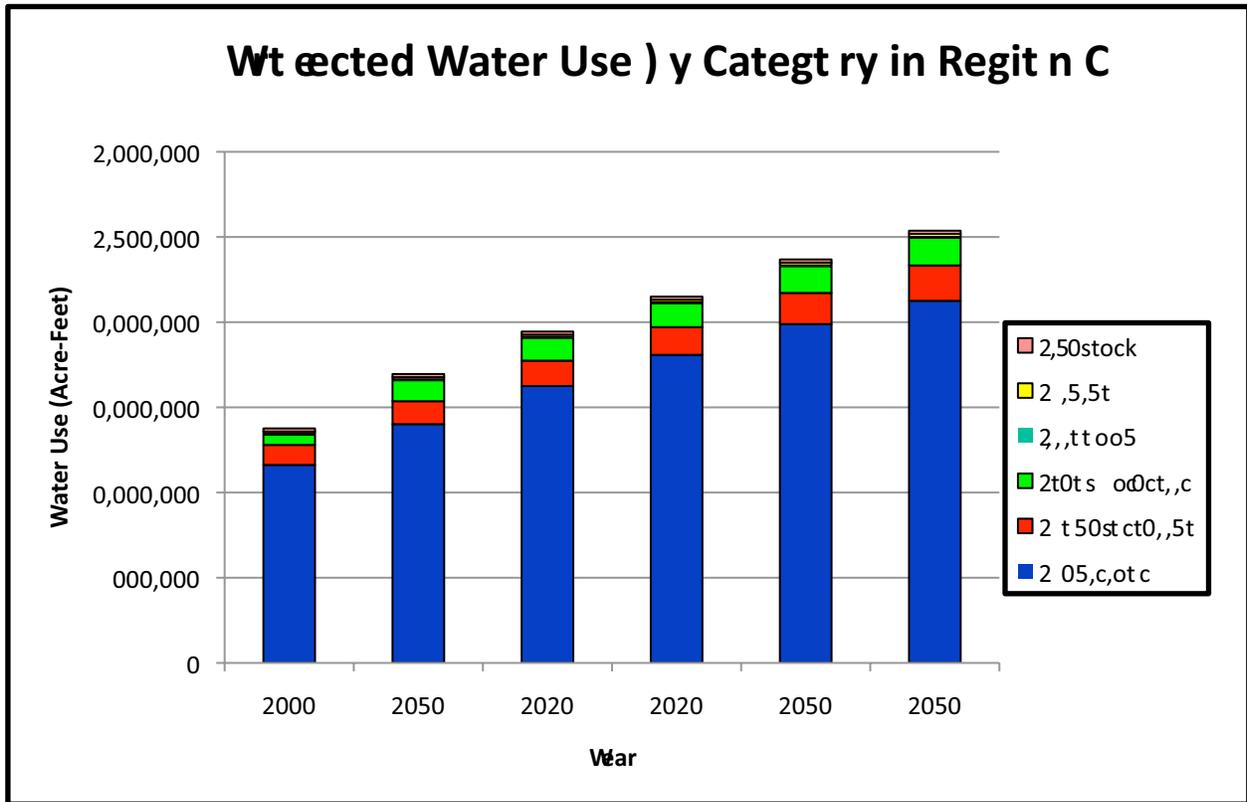
http://www.twdb.state.tx.us/publications/State_Water_Plan/2002/WaterforTexas2002.pdf; TWDB, *Water for Texas – 2007*, Volume 2, p. 123,

http://www.twdb.state.tx.us/publications/State_Water_Plan/2007/2007StateWaterPlan/CHAPTER%204_Final_112806.pdf; TWDB, *2012 – Water for Texas*, Chapter 3, p. 137,

http://www.twdb.state.tx.us/publications/state_water_plan/2012/03.pdf

Exhibit 1

2001 Region C Water Plan



Source: Texas Water Development Board

As mentioned above, estimating municipal water demand requires not only a population projection, but also a forecast for how much water a person will use each day, on average. In general, this figure is based on records of total water used (residential, commercial, and institutional), which is divided by the population number of the time. The amount is expressed in gallons and is known as “**gpcd**,” or gallons per capita per day, and naturally it varies widely across the state due to differences in everything from climate to commercial activity to income. Multiplying gpcd by the projected population of a given area (city, county, region) is how water demand projections are formulated for the area.

Although comparing gpcd between different cities has limited value due to the reasons stated above, the state water plans do include a table that shows the per capita municipal use projections for the 40 largest cities in Texas for the coming decades. In the 2002 plan,

there were 12 of Region C's cities in the list: four in the 10 largest gpcd numbers, four in the second-highest quartile, and two cities each included in the second-least and lowest per capita use groups. While comparison between cities may not demonstrate profligate or efficient water use, an individual city's plans for water in future years can indicate whether the planners expect to attempt to reduce high water demands.

The dozen North Central Texas cities in the per-capita-use table in the 2002 state water plan have some patterns in their projections. Richardson, the city with the highest municipal use (of the whole list, not just in Region C) planned to decrease its gpcd by about 6 percent, from 275 to 258. That projected 2050 figure, however, was about equal to the next three highest cities' 2000 per capita use amounts (two of which are also in the Metroplex). (**Exhibit 2**) Overall, six (including the top) of the Region C cities in the table projected some level of steady reductions in future gpcd amounts, and two more had reductions that were not so steady – one whose only drop in gpcd was not projected until 2050, the other reducing gpcd by 2020 but not beyond. The other four's 2050 projected gpcd was about the same or even higher than their 2000 numbers, all with substantial increases in the early decades of the planning period.

Exhibit 2

Projected Per Capita Water Use for Largest North Central Texas Cities⁸

(Values in gallons per capita per day)

City	2000	2010	2020	2030	2040	2050	% Change 2000-50
Richardson	275	275	266	262	259	258	- 6.2
Dallas	260	275	275	272	268	264	+ 1.5
Plano	259	272	265	260	258	258	- 0.39
Fort Worth	230	225	221	216	212	207	- 10.0
Denton	211	199	190	186	184	183	-13.3
Irving	210	230	230	225	220	216	+ 2.9
Lewisville	210	220	230	230	225	220	+ 4.8
Carrollton	200	200	200	195	190	180	- 10.0
Arlington	190	195	192	188	181	180	- 5.3
Mesquite	165	165	165	165	165	147	- 10.9
Garland	161	148	141	141	141	141	- 12.4
Grand Prairie	160	155	160	150	145	140	- 12.5

Source: Texas Water Development Board

This brings us back to the other factor used in building demand projections – conservation. Often also called efficiency in water use, conservation allows the resource to go further and serve more people with the same amount; it reduces demand. In the case of municipal

⁸ Texas Water Development Board, *Water for Texas – 2002*, Vol. I, p. 33,

http://www.twdb.state.tx.us/publications/State_Water_Plan/2002/WaterforTexas2002.pdf

use this obviously reduces gpcd. Nearly as obvious, however, is that some forms of conservation are easier to implement, consider reliable, and achieve measurable savings from than others.

Despite SB1's requirements for water providers as well as regional planning groups to develop conservation plans, and the acknowledged importance of conservation to help meet the enormous demands for water in Texas, **the Municipal Water Demand section in the 2002 State Water Plan had a subsection on conservation that was very brief.** In it, TWDB stated that the standards for water-efficient plumbing fixtures established in Texas in 1991 was "a driving force in expected municipal water savings" and added that one of the advantages of such a method was that those savings "do not require day-to-day behavior changes by the consumer."⁹ **The 2002 plan projected that savings from conservation would result in a reduction in municipal demand of about 12 percent by the year 2050.**

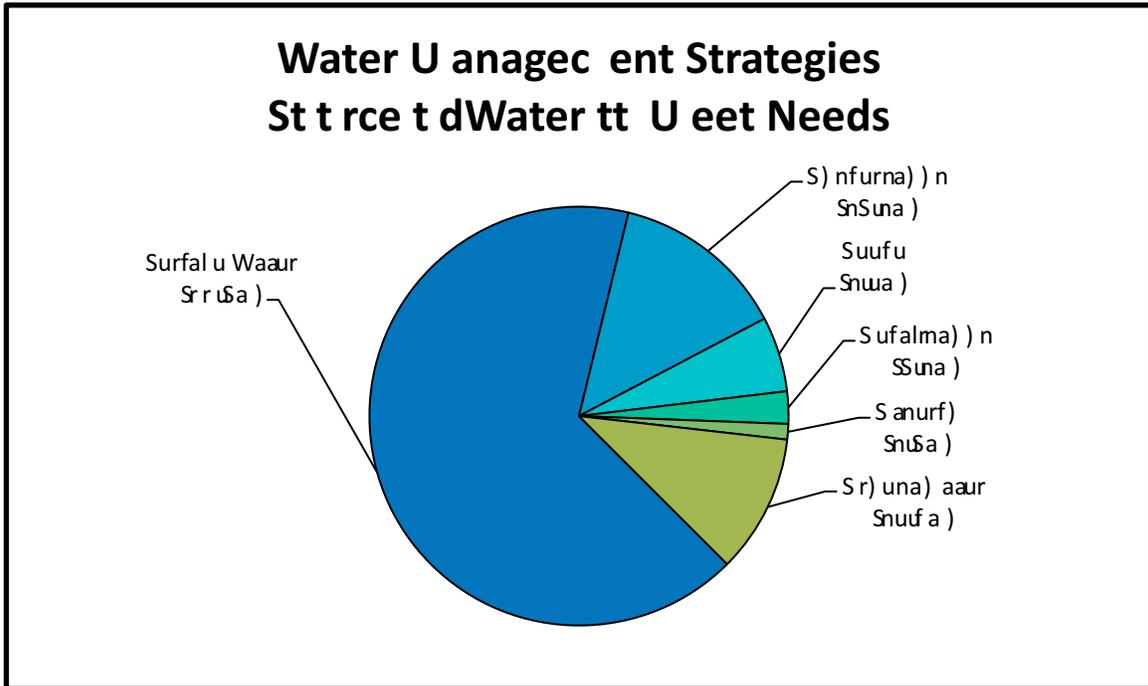
There was a somewhat longer discussion of water conservation in the "Recommended Water Management Strategies" chapter of the 2002 plan. As explained earlier, the water plans devise strategies to meet identified "needs" in a water use sector, a situation where the projected demand by, for example, a city, will exceed existing supply at some point in the future. Water conservation was the first recommended strategy summarized in the chapter, specifically that "about 21 percent of the water user groups with needs recommended conservation as a water management strategy." Nearly 30 percent of those water user groups recommending water conservation were in the irrigated agriculture

⁹ Texas Water Development Board, *Water for Texas – 2002*, Vol. I, p. 34,

http://www.twdb.state.tx.us/publications/State_Water_Plan/2002/WaterforTexas2002.pdf

sector, and overall conservation was planned to meet 13.5 percent of the state’s identified needs.¹⁰ (Exhibit 3)

Exhibit 3
2002 State Water Plan



“Others” includes weather modification, brush control, aquifer storage and recovery, and contract renewals from systems with a mixed supply of groundwater and surface water.

Source: Texas Water Development Board

The strategy summary in the 2002 state plan also briefly discussed the increased awareness of water conservation, thanks to drought conditions in the state during the late 1990s, and again noted the variability of per capita use projections. It acknowledged that some regions actually predicted an increase in gpcd, unlike the majority of the planning regions that projected decreases. **Region C was one of the regions that expected**

¹⁰ Texas Water Development Board, *Water for Texas – 2002*, Vol. I, p. 71, http://www.twdb.state.tx.us/publications/State_Water_Plan/2002/WaterforTexas2002.pdf

its overall municipal gpcd to rise; indeed, per capita increases accounted for the majority of the region’s 28.9 percent upward adjustment of the Water Development Board’s previous 2050 water demand projection for the region. The reason given for about half of the gpcd increase, however, was that “actual per capita municipal demand in recent years” was already higher than TWDB’s earlier projections. Nonetheless, **Region C also decided to plan for continuing the trend of increasing per capita use in the region’s cities for at least the next 10 to 20 years**. Their plan pointed out that the projected increases in demand would have been even larger without “assumed” savings from water conservation.¹¹

In North Central Texas, the Region C planners evaluated many conservation methods for their recommendations, and calculated that conservation would save 15 percent of the original municipal per capita demand they projected. **More than half of the reduction in municipal demand was due to the use of low-flow plumbing fixtures**, the same “driving force” behind municipal water savings that the state plan spoke of; the rest was expected to come from measures such as conservation in landscape irrigation (the second largest potential savings after plumbing fixtures), leak repairs, and, to make the savings a reality, programs to educate the public (including policy makers) about the importance of water conservation. In addition, the Region recommended doing an assessment of the effectiveness of conservation measures during the next 5-year planning period. Region C also suggested that the state increase its participation in water conservation, especially with funding for education and for evaluation of programs.¹²

¹¹ TWDB, *Region C Water Plan*, Section 2, p. 2.18,

http://www.twdb.state.tx.us/RWPG/2001_RWP/c/PDFs/Regional%20Plan%20Main%20Text/Section%2002.pdf

¹² TWDB, *Region C Water Plan*, Section 5, pp. 5.7 - 5.9,

http://www.twdb.state.tx.us/RWPG/2001_RWP/c/PDFs/Regional%20Plan%20Main%20Text/Section%2005.pdf

In addition to water conservation there is one other water management strategy that maximizes use of an existing supply, rather than developing additional water sources. This strategy, called “reuse,” uses treated wastewater as a water supply, either directly or indirectly. Direct reuse takes the treated water – called effluent – directly from the wastewater plant to be used for select purposes, such as watering golf course or industrial cooling. With indirect reuse, the treated wastewater is returned to a river or reservoir (the usual destination for wastewater) and then is “retrieved” (diverted) from that source to be re-treated and become “new” water supplies.

Region C planners included reuse as one of the strategies with which to meet the region’s projected 2050 needs, and said that reuse was expected to become “an increasingly important source of water.” In 2001 there were already more than a dozen reuse projects in use or being developed; more than half of those were direct reuse for watering golf courses, but by far the greatest amount of water was reused indirectly for municipal supplies.¹³ **By 2050, reuse was planned to cover 34 percent of Region C’s needs. The plan did not include conservation measures beyond those required to achieve the “assumed” savings built into the municipal demand projections, as discussed above.** (Exhibit 4) A new major reservoir, however, was recommended, estimated to cost around \$1.625 billion, approximately 26 percent of the capital costs of all the Region C water strategies over the entire 50 years.¹⁴

As mentioned earlier, this was the first SWP that grew out of multiple, regionally generated plans – a new, time-consuming, and often difficult thing for the regions to produce. Conservation planning, however, was not entirely new to water providers and

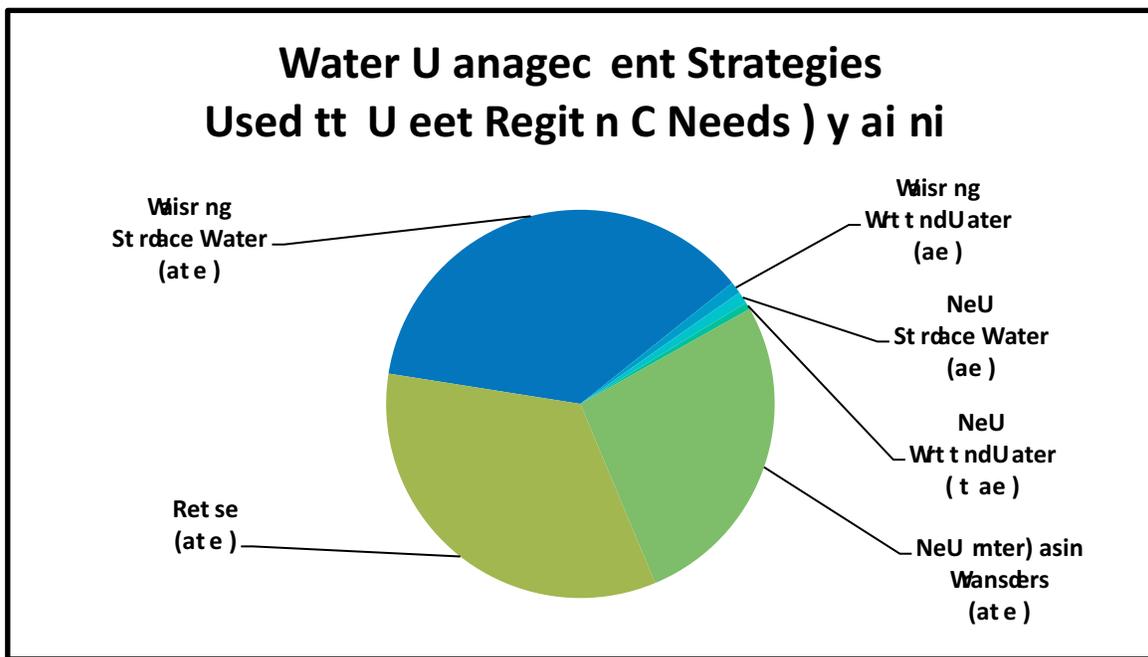
¹³ Texas Water Development Board (TWDB), *Region C Water Plan*, Section 5, pp. 5.10 - 5.11, http://www.twdb.state.tx.us/RWPG/2001_RWP/c/PDFs/Regional%20Plan%20Main%20Text/Section%2005.pdf

¹⁴ TWDB, *Region C Water Plan*, Section 5, p. 5.8; TWDB, *Water for Texas – 2002*, Vol. I, p. 90, http://www.twdb.state.tx.us/publications/State_Water_Plan/2002/WaterforTexas2002.pdf;

utilities. In the years prior to the creation of the RWPGs, loans from TWDB for water projects and applications for new surface water rights permits from the state carried a requirement that the entity develop water conservation and drought contingency plans. In addition, the same SB1 that created the new format for the SWP also required that each entity that had a surface water rights permit for at least 1,000 acre-feet a year of non-agricultural use develop its own conservation plan to be submitted to the state. Naturally, those plans were to be consistent with the regional water plans, adding even more impetus for collaboration and cooperation between the regional planners and the area's water suppliers during the planning process.

Exhibit 4

2002 State Water Plan: Region C Summary



Source: Texas Water Development Board

The people for whom the issue and methods of water conservation was fairly new in 2002 were most of the general public, especially those who lived in cities, suburbs, and towns. While farmers and ranchers – whose living requires attention to sources and quantities of water – have always been familiar with concepts of water use efficiency, the vast majority of Texas' increasingly urbanized

population generally did not think about where the water in their faucets came from or how much they used. There are certain cities, such as El Paso and San Antonio, that have important supply limitations and growing populations, and so have had strong water conservation programs for the past 10 – 20 years. As we can tell by the heavy reliance on new plumbing fixtures to produce conservation water savings in the regional and state plans, those cities were the exception. **“Behavior changes by the consumer,”** that require elements of political will, education, regulation, steady implementation, and time to achieve, as well as plentiful and reliable data with which to track them, are difficult to plan for, much less achieve. **Many RWPGs, even in high per capita use areas like the Metroplex, seemed reluctant in the early part of the last decade to count on saving water by developing programs to bring about such changes.**

This, then, is where North Central Texas was in 2002: poised just inside the threshold of a new era in planning for water management, where the RWPG, water suppliers and utilities, water user groups, and a large number of the fastest-growing communities in the state have to figure out, on an ongoing basis, not only how to predict how much water everyone will want to use in each of the future five decades (and how many “everyone” will be), but where that water will come from. While **it is true that water saved by conservation is the most readily available and *cheapest* source of already clean, consumer-ready water**, it is also true that at that point in time there was uncertainty about how best to tap that source and whether significant amounts of water could result from doing so. Thus it was that in the initial Region C plan, water conservation was not a “critical,” or even a very significant element in meeting North Central Texas’s projected long-term water needs.

Conservation Today: North Central Texas in 2012

Fast-forward ten or eleven years from the beginning of multiple water management plans and the first required conservation plans. What has changed in North Central Texas in the thinking and policies about water use? And what has happened in that time to spur those changes?

One of the most influential elements in an increased focus on water issues is the same as it ever was – drought. Texas experienced five periods from 2000 – 2011 in which 100 percent of the state was considered to be in some stage of drought; a couple of these dry spells lasted more than a year.¹⁵ The 2011 drought, which as of this writing is still ongoing in multiple parts of the state, certainly brought more attention to water conservation, as many cities implemented their drought contingency plans. Those plans call for landscape watering restrictions that for some cities are always in effect, such as the time of day or number of days that watering is allowed.

Since 2002, two more revised sets of regional water plans have been rolled into the 2007 and 2012 state water plans. Both of these plans were developed while the state was suffering from severe droughts. The plans projected new numbers for populations, water demands, and supply needs (demands not met by existing supplies), and proposed strategies to meet the needs for the next five decades. Also, the Texas Legislature continued to consider, and in some cases pass, new laws affecting water planning and management, including conservation, across the state.

¹⁵ Nathan Bernier, “History of Texas Drought, 2000-2011,” KUT News (April 11, 2011), <http://kutnews.org/post/history-texas-drought-2000-2011>

Statewide

A year after the 2002 State Water Plan, the Legislature specified some elements to be in the water conservation plans that were first required by the 1997 Senate Bill 1. **The new-format plans, the first of which was due on May 1, 2005, were required to:**

- **Establish 5-year and 10-year targets for quantities of saved water,**
- **Within those targets, have goals for reducing municipal gpcd,**
- **And likewise formulate goals for programs addressing water loss.**

These water conservation plans were to be updated regularly; the first conservation plan update was due on May 1, 2009 and then on May 1st every five years ongoing.

Also in the 2003 legislative session, a bill was passed that created the state's Water Conservation Implementation Task Force (**WCITF**). According to the Texas Water Development Board (**TWDB**), the task force was charged "to review, evaluate, and recommend optimum levels of water use efficiency and conservation for the state, and develop a best management practices guide for use by planning groups and political subdivisions responsible for water delivery service."¹⁶ The *Water Conservation Best Management Practices Guide* was produced by WCITF in 2004, along with a report on the Task Force's work on its assigned tasks and a set of recommendations for the legislature to consider.

Three years later, in the 2007 session, the Legislature again upped the number of entities required to formulate water conservation plans, this time including retail water utilities (selling water to individual households and businesses) that have 3,300 connections or

¹⁶ TWDB and Texas State Soil & Water Conservation Board, "An Assessment of Water Conservation in Texas," (December 2006), p. 7,

http://www.tsswcb.texas.gov/files/docs/waterconservation/TWDBTSSWCB_80th.pdf

more. Their initial plans were due on the same date as the previously required updates, the first of May in 2009, and the plans for these utilities, serving cities small and large, must include implementation schedules for the programs to achieve their goals, and ways to track the progress made. All of the entities producing conservation plans submit an annual report on May 1st that covers the implementation and results of the plans.

In 2011, a bill passed by the Legislature required an effort to find an answer on how to measure water conservation programs' impact on water use. The WCITF had, in its 2004 report to the legislature, established standard methods for calculating total and residential gallons per capita per day (**gpcd**), in order to have benchmarks in tracking progress on conservation plans. But because municipal gpcd has such variability across different climates, water customers, and even in how it is calculated, comparisons of gpcd among cities and other municipal water suppliers are problematic. Other sectors of water use, such as agricultural or industrial, are even less well served by gpcd, as their amounts are not necessarily connected to population size. The TWDB and the Texas Commission on Environmental Quality (**TCEQ**) were tasked by the legislature to work with the Water Conservation Advisory Council to "develop a uniform, consistent methodology and guidance for calculating water use and conservation." In the municipal sector the metric will classify and account for the different types of water users, provide methods to calculate both total and residential use in gpcd, and allow for consistent water conservation reporting by cities and utilities.¹⁷ Initial guidance and methodology for water conservation reporting is being finalized by TWDB and TCEQ in consultation with the Advisory Council and is expected to be published for public distribution in January 2013.

¹⁷ Texas S.B. 181, 82nd Legislature, Regular Session, (2011)

<http://www.capitol.state.tx.us/tlodocs/82R/billtext/pdf/SB00181F.pdf#navpanes=0>

Water Planning

The state water plans since 2002 likewise reflect an increased focus on water conservation. The 2007 plan, in the chapter describing different water management strategies, said, “In recent years, the awareness and understanding of water conservation and water use efficiency has grown significantly in Texas.” It goes on to compare the volumes of water from conservation strategies in the 2002 plan with those in 2007. **In the 2002 plan, water conservation was projected to meet close to 988,000 acre-feet of the state’s water needs by 2050 (representing 13.5 percent of all the water management strategies). In the 2007 state water plan the amount of water to be provided through conservation had increased to nearly 1,896,000 acre-feet by 2050(23.2 percent of the total projected).**

The 2012 State Water Plan (**SWP**) shows a slightly larger portion of the water needs being met by conservation: about 2,024,000 acre-feet in 2050, or 25.6 percent of the total. **It is important to remember, however, that the conservation projections include water conservation in the irrigated agriculture sector.** The savings from municipal water use represents about 27-30 percent of the conservation total in the later plans, roughly 7 percent of the volume projected from all strategies for 2060.¹⁸

Another indicator of an emphasis on conservation within the water planning process appears in a changed format after 2002 for the regional summaries in the state water plans. In the new format, immediately following the section on “Recommended Water Management Strategies and Cost,” the summaries for every region in both 2007 and 2012

¹⁸ Texas Water Development Board (TWDB), *Water for Texas – 2007*, Chapter 10, pp. 259-260, http://www.twdb.state.tx.us/publications/State_Water_Plan/2007/2007StateWaterPlan/CHAPTER%2010%20final_112706.pdf; TWDB, *Water for Texas – 2012*, Chapter 7, pp. 189-190, http://www.twdb.state.tx.us/publications/state_water_plan/2012/07.pdf

include a section called “Conservation Recommendations.” In light of the number of entities across the state now required to develop and update water conservation plans, and the resulting growing body of data on conservation measures and implementation results, the water management plans can be expected to continue to include more information on the subject in the future.

Region C

Just as in the statewide plan, Region C’s 2006 and 2011 water plans have much more to say about water conservation than the first regional plan from 2001. The plans have sections and chapters on the subject of water conservation; these usually discuss reuse strategies as well. The region’s planning group explicitly includes reuse when proposing water-saving strategies, citing the Texas Water Code definition of conservation which includes measures that “increase the recycling and reuse of water,” along with those that actually reduce water consumption and waste. Consequently, both plans state that “it is clear that reuse of treated wastewater effluent is a water conservation measure.”¹⁹ When calculating water savings projected to result from Region C’s recommended strategies and their effect on the region’s per capita water use, the plans present the numbers expected without any conservation, with recommended conservation strategies, and with both conservation and reuse strategies.

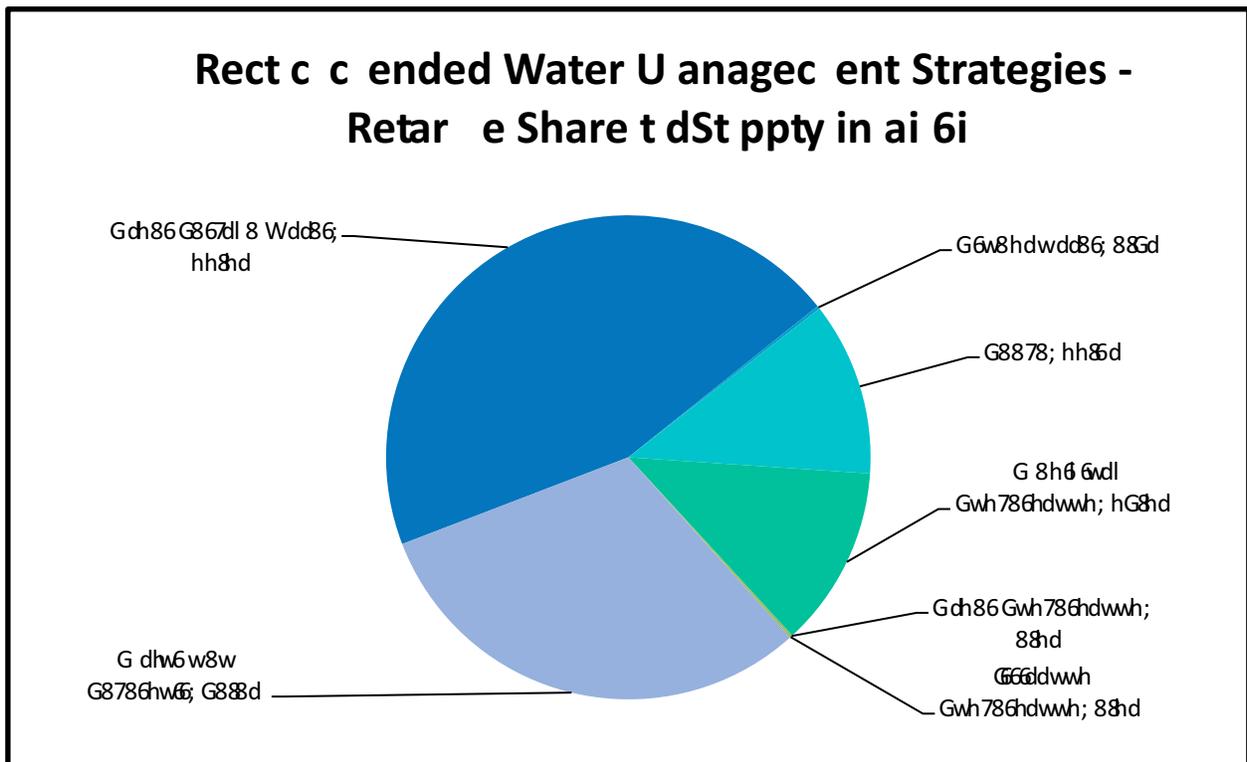
In the 2007 SWP Region C summary, the “Plan Highlights” included a combined figure of more than one million acre-feet as the amount of water that conservation and reuse

¹⁹ Texas Water Code, Chapter 11 – Water Rights, Section 1.002, “Definitions,” <http://law.onecle.com/texas/water/11.002.00.html>; Texas Water Development Board (TWDB), 2006 *Region C Water Plan*, Chapter 4B, p. 4B.1, http://www.twdb.state.tx.us/waterplanning/rwp/plans/2006/C/Region_C_2006_RWP.pdf; and TWDB, 2011 *Region C Water Plan*, Chapter 4B, p. 4B.1, http://www.twdb.state.tx.us/waterplanning/rwp/plans/2011/C/Region_C_2011_RWPV1.pdf.

strategies were expected to provide by 2060; the conservation portion of that figure, however, was less than 30 percent. The Region C summary in the 2012 SWP improves the information highlighting conservation – it includes separate water volume percentages for conservation and reuse strategies in the highlights and adds a pie chart with conservation details. (Exhibit 5)

Exhibit 5

2012 State Water Plan: Region C Summary



Source: Texas Water Development Board

The planning group in North Central Texas, in preparing for the second and third water plans, spent significant time and effort assessing the feasibility of various conservation methods, as well as gathering information about which programs had already been implemented in the region and by which entities. In Region C’s 2006 water plan, a survey of water user groups (WUGs) and wholesale water suppliers allowed the planners to get a sense of what types of conservation techniques were being used. They divided the methods into categories of

water use, including one called “System/Utility” for programs addressing the bulk of water before it is distributed to retail end-users. The survey found that most of the conservation techniques that had been implemented were at that wholesale, system level, rather than being aimed at the residential customers’ particular indoor and outdoor uses, or the industrial, commercial, and institutional water users. The system strategies implemented were:

- System water audit and water loss prevention,
- Pressure control and leak detection,
- Public information and school education,
- Water waste prohibition,
- Water conservation pricing.²⁰

In addition, the planners worked to define and refine estimates of the costs of implementing, and the amounts of water saved by, different water conservation strategies. They were assisted in this task by a Texas Water Development Board study from 2002 that was designed to provide the planning regions with just that type of information.

Region C’s recommended water conservation strategies were based on all these data sources; the recommendations were divided into a Basic and Expanded groups, with the Basic strategies recommended for all municipal WUGs. The Expanded package of strategies was recommended for more than 45 percent of those WUGs. The 2011 Region C Water Plan updated the information on feasibility, costs, and savings, and changed the designation of two conservation strategies –conservation pricing structure and water waste prohibition – from Expanded to Basic, while adding irrigation restrictions to the

²⁰ Texas Water Development Board (TWDB), *2006 Region C Water Plan*, Chapter 6, pp. 6.19-24, http://www.twdb.state.tx.us/waterplanning/rwp/plans/2006/C/Region_C_2006_RWP.pdf

Expanded package. In this plan, the Expanded group of conservation strategies was recommended for more than 50 percent of the WUGs.²¹

Comparing Region C's 2006 and 2011 water plans' actual goals and projections for conservation, however, can lead to an interesting conclusion. **Despite more discussion, studies, data, and conservation planning by more entities, the expectations for what could be achieved in saving water are relatively unchanged in the five years between the plans.** Overall, the population projections over the decades up to 2060 are close to the same in the two plans, yet the amount of water expected to be saved by that year is slightly lower in the 2011 plan (about 291,000 versus 298,000 acre-feet) and the projected demands for municipal use are also very slightly higher for the five decades. **Indeed, neither plan's projected conservation water savings for the region come close to those of the 1997 State Water Plan's – it had estimated that by 2050, Region C could be saving “approximately 465,000 acre-feet.”**²²

Although a stronger emphasis on water conservation might be expected to reduce demand and save more water, possibly the planners did not predict those results because of other considerations – experience in projecting numbers for the future of growth and water, for example – or they were being cautious in expecting changes in behavior and water use that require time and effort to achieve. It is not very surprising that those laying out many

²¹ TWBD, “Quantifying the Effectiveness of Various Water Conservation Techniques in Texas,” <http://www.twdb.state.tx.us/conservation/municipal/plans/doc/GDSReport.pdf>; TWDB, *2006 Region C Water Plan*, Chapter 6, pp. 6.22-23, http://www.twdb.state.tx.us/waterplanning/rwp/plans/2006/C/Region_C_2006_RWP.pdf; and TWDB, *2011 Region C Water Plan*, Appendix K, p. K.1 and Chapter 6, p. 6.19, http://www.twdb.state.tx.us/waterplanning/rwp/plans/2011/C/Region_C_2011_RWPV1.pdf.

²² TWDB, *Water for Texas – 1997*, Section 3.2, p. 3-38, http://www.twdb.state.tx.us/publications/State_Water_Plan/1997/Ch_3.2_Regions.pdf.

predictions for the future of a rapidly growing area would be careful in setting up expectations for what the next 50 years will bring. Perhaps, instead, the surprise will be that those living in Region C will learn about and conserve water better than expected.

Major Water Suppliers

As the changes in planning requirements legislated by the state indicate, policy-makers in Texas have decided that water conservation needs to be part of the thinking and operations of practically everyone involved with supplying water on even a moderately-sized scale. As explained earlier, the type of non-agricultural water provider that must submit a conservation plan to state agencies, originally limited to those wholesalers with a water permit for 1,000 acre-feet or more, was redefined in 2007 to include retail suppliers or utilities with at least 3,300 connections.

In North Central Texas, there are about four dozen entities that each provide more than 5,000 acre-feet of water a year to their customers, wholesale and retail. Of these, the top four by amount of water supplies are: Dallas Water Utilities (**DWU**), Tarrant Regional Water District (**TRWD**), North Texas Municipal Water District (**NTMWD**), and the City of Fort Worth. Together, these four suppliers accounted for 58.2 percent – nearly 1.42 million acre-feet – of the water that was sold by all of the region’s largest water providers in 2006 (which was, it should be noted, a dry year). They are, however, different types of water providers; TRWD and NTMWD essentially sell only wholesale water, while Fort Worth’s water sales are 30 percent wholesale, and DWU’s customers are also split, with roughly 37 percent being wholesale and 63 percent retail.²³

²³ Texas Water Development Board, *2011 Region C Water Plan*, Chapter 1, pp. 1.38 – 1.44
http://www.twdb.state.tx.us/waterplanning/rwp/plans/2011/C/Region_C_2011_RWPV1.pdf; Dallas Water Utilities, *City of Dallas Water Conservation Plan*, June 2010, p. 14,
<http://savedallaswater.com/pdf/Dallas%20Water%20Conservation%20Plan.pdf>.

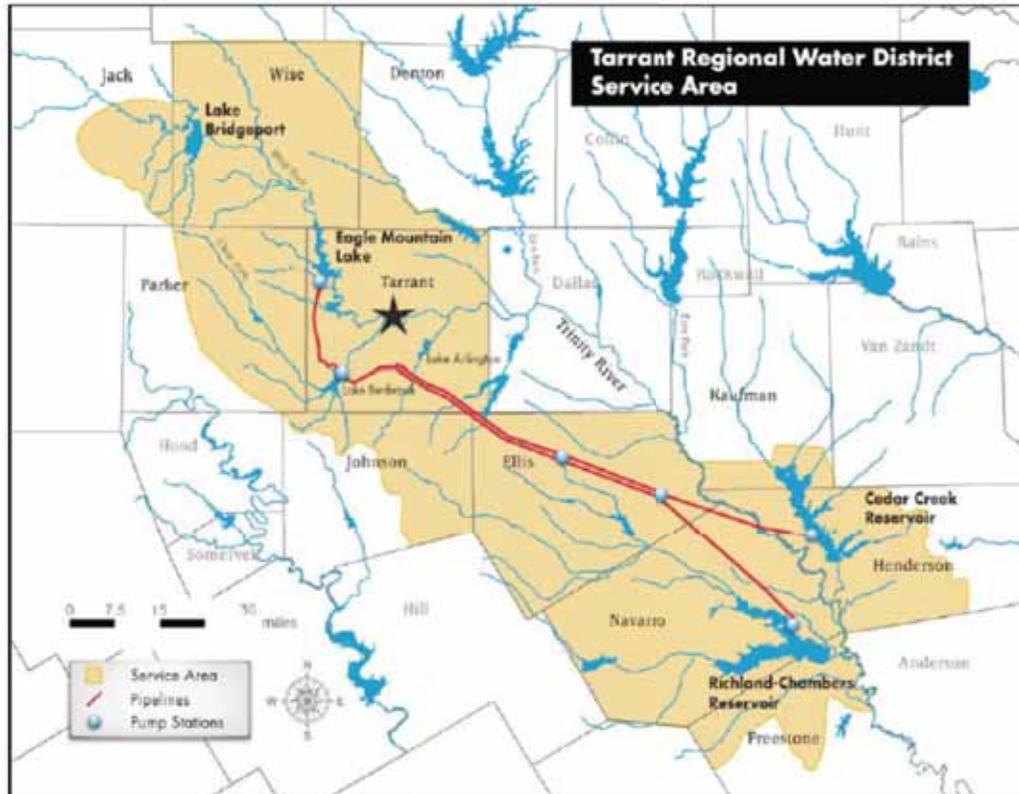
With regards to conservation, there are of course differences in what actions wholesalers and retailers can take. In addition, the financial implications of saving water for an entity that builds and operates reservoirs and treatment plants, builds pipelines, and contracts with cities to deliver hundreds of thousands of acre-feet of water every year, differ greatly from those for a utility delivering X number of gallons of water to hundreds of thousands of businesses and households, maintaining water and wastewater distribution systems, and reading meters to send bills. If, for example, the customers of the entities that develop water supplies can reduce their demand enough through conservation practices, the water suppliers can postpone, often with great monetary savings, capital expenditures for new pipelines or, even more expensive, new reservoirs.

Both of the wholesale providers, NTMWD and TRWD, have established – as required by the state – water conservation and drought contingency plans. They both also require their customer cities to submit annual water conservation reports, and provide templates to assist the cities in developing their own water conservation plans. The water districts are quasi-governmental, not-for-profit organizations with elected boards of directors and bonding authority, created to supply their customers with raw (TRWD) or treated (NTMWD) water, as well as provide, in the case of Tarrant, flood control and, for North Texas, wastewater (and solid waste) services.

Tarrant Regional Water District (TRWD) is the older of the two wholesale providers, created in 1924 in response to intense floods in Fort Worth. Three years later, voters approved bonds for the construction of the first two of the four reservoirs that TRWD owns and operates (some of the district's water comes from other reservoirs as well). Now, 85 years later, TRWD's service area has a population of roughly 1.8 million people in 10 counties on the western side of the Metroplex. [Exhibit 6] Although TRWD has more than 30 wholesale customers, four of them account for 90-92 percent of its sales: the cities of Fort Worth, Arlington, and Mansfield, and the Trinity River Authority (which also has water rights of its own from other reservoirs). Those entities in turn provide both

wholesale and retail raw and treated water to their own customers; as noted above, Fort Worth is itself one of the four entities supplying the most water in the region.²⁴

Exhibit 6



Source: Tarrant Regional Water District

North Texas Municipal Water District (NTMWD) has a less convoluted role as a water supplier than that described above. Established by the Texas Legislature in 1951 in response to a request by ten cities in an area east and north of Dallas, the district’s original and still primary purpose is “to develop, finance, construct, and operate facilities to meet [the cities’] future water needs.” The ten communities became NTMWD’s original member cities, whose city councils appoint their representatives to the district’s board of directors;

²⁴ Texas Water Development Board, *2011 Region C Water Plan*, Chapter 1, pp. 1.46, 1.48
http://www.twdb.state.tx.us/waterplanning/rwp/plans/2011/C/Region_C_2011_RWPV1.pdf

three more cities have since become members as well. In addition to its member cities, North Texas provides water to about 50 other customers, which include utility districts and water supply corporations as well as cities and towns. Ten of NTMWD's 11 largest water sales in 2006 were to member cities, accounting for nearly 86 percent of the total.

The service area of NTMWD, located primarily in five counties (and including small parts of three others) east and north of Dallas, has a population of approximately 1.6 million.

[**Exhibit 7**] The district owns four large wastewater treatment plants that make up its Regional Wastewater System, providing services to more than 800,000 people, as well as owning or operating more than a dozen smaller, city wastewater plants.²⁵

²⁵ Texas Water Development Board, *2011 Region C Water Plan*, Chapter 1, pp. 1.49-1.51 http://www.twdb.state.tx.us/waterplanning/rwp/plans/2011/C/Region_C_2011_RWPV1.pdf; "NTMWD Water Conservation and Drought Contingency and Water Emergency Response Plan," p. 3-1, <http://www.ntmwd.com/downloads/plans/plansntmwdcombined.pdf>; and "North Texas Municipal Water District," <https://ntmwd.com/history.html>.

Exhibit 7

NTMWD Service Area



Source: North Texas Municipal Water District

These two water districts' conservation plans are very similar in most ways, following as they do the state regulations. As regional water districts, they do not have the same means to directly affect end users' water consumption that a city utility does, such as passing ordinances or running conservation programs aimed at individual retail customers. Their conservation goals, fulfilling the state's requirements for wholesale suppliers that are mostly oriented towards system efficiencies, include:

- Universal metering for customers and proper calibration and maintenance of the meters

- Keeping ‘lost’ (unaccounted for) water at a small percentage of the total – the goal for these districts is 5 percent
- Having a program for detecting and repairing leaks
- Using ‘reuse’ water as a supply source. For NTMWD in 2008, the goal was to continue and expand their reuse program, enabled by the large amounts of treated wastewater from their plants. TRWD’s first indirect reuse project became operational in 2009, using constructed wetlands for additional cleaning of the water returned to the Trinity River after it was taken from TRWD reservoirs and used by the district’s customers.

Another element required in the conservation plans is a continuing public education and information program; consequently, both of the districts have a goal to help district customers with their programs to educate the public about water conservation, and ways to save water and use it more efficiently.

NTMWD has done public presentations to civic groups and government staff in its customer cities, as well as distributed informational materials, and provided funding for the Smartscape, Water-Wise, and Water IQ: Know Your Water programs. By 2008, North Texas had spent more than \$5.5 million on Water IQ, the statewide water conservation public awareness campaign conceived by the Water Development Board for local entities to adapt and use. By this year, the total spent by NTMWD on public awareness and outreach is more than \$10 million.

In its 2010 Water Conservation Annual Report, NTMWD writes that, between conservation and reuse, it saved 34.5 percent of the total water produced; the reuse portion was 23 percent. **The conservation savings amounted to more than 11.6 billion gallons of water.** Comments on the report point out that, because weather conditions affect water use so significantly, water conservation savings cannot be readily distinguished from weather-related changes in use, though reuse savings are

“quantifiable.” The district’s executive director says that **with all the different conservation programs going on in the area, he has seen a 10 – 12 percent reduction in water supplied by NTMWD.**²⁶

The Tarrant district has also supported Smartscape and Water-Wise, plus the Texas Rivers program, distributed water conservation materials, made group presentations, and produced an online conservation newsletter, as well as funding a couple of demonstration water conservation gardens in Fort Worth and Arlington.²⁷ In 2007, TRWD contacted Dallas about using their “Save Water, Nothing Can Replace It” tagline in developing the district’s public outreach campaign. By 2009, the organizations decided to completely integrate their two programs to have “one voice, one message,” combining their outreach budgets into more than \$1.5 million of annual spending. **TRWD believes this “collaborative partnership” with Dallas has been “an extremely successful way of getting the message out.”** The total water conservation budget for the district is about \$1.2 million.

TRWD addressed the issue of measuring the water savings from water conservation when the district hired the Alan Plummer Company to develop a strategic plan for their conservation program, part of which was a model of water use without any conservation. Using the model, TRWD calculates that between 2007 and 2011 the district has saved 45.6

²⁶ “*NTMWD Water Conservation and Drought Contingency and Water Emergency Response Plan*,” pp. 4-1, 8-1 – 8-2, <http://www.ntmwd.com/downloads/plans/plansntmwdcombined.pdf>; Texas Water Development Board, “Water Conservation Annual Report,” Utility Data: NTMWD, 3/28/2011; and Interview with James Parks, Executive Director/General Manager, NTMWD, July 27, 2012.

²⁷ “*TRWD Water Conservation and Drought Contingency Plan*,” pp. 4-1, 8-2 – 8-4, http://www.savetarrantwater.com/Shared%20Documents/TRWDconservation_drought_plan_final_April_2009.pdf

billion gallons, nearly 140,000 acre-feet of water. **According to a district manager, TRWD is spending less than 10 cents per 1,000 gallons of saved water.**²⁸

Leaders of both of these major water suppliers have similar ideas of what they perceive as the biggest obstacle, or “challenge” to achieving the highest level of efficiency or conservation in the area. Getting people to change their behavior is challenging, especially because there is a resistance to change; when change is urged, it is “not exactly embraced instantaneously,” was the diplomatic way the conservation manager at TRWD put it. The executive director of North Texas notes that it is human nature to be inclined to do what you want to do, and believes that peer pressure is “stronger and more effective than ... a bunch of regulations and rules.” As shown above, both organizations have made large investments in public outreach in order to overcome that resistance and build peer pressure.²⁹

Certain aspects of the operation of North Texas Municipal Water District (NTMWD) are significantly different from other wholesale water providers. NTMWD’s member cities, which account for 85 percent of all the water used by the district’s customers, have one uniform contract that continues “in perpetuity or for the useful life of the system;” this is quite unusual, as most water contracts have term limits, though they might be decades long. This contract, as well as the individual contracts of the customer, non-member, cities (which do have term limits), are based on what is called “minimum annual demand.” Also referred to (interestingly) as the “maximum annual demand,” the contract term means that the largest amount of water that a city uses in any year becomes the amount of water it pays for *every* year. If, in a dry year or a time of growth, for example, a city ends up using more water than its established maximum, that larger amount becomes its new minimum

²⁸ Interview with Mark Olsen, Conservation & Creative Manager, TRWD, August 3, 2012.

²⁹ Interview with Mark Olsen; Interview with James Parks, Executive Director/General Manager, NTMWD, July 27, 2012.

that it will pay for each year thereafter (until or unless the city uses an even larger volume).

This contract minimum allows NTMWD, which has the authority to issue revenue bonds to finance the development of the district's system, to expect and plan on receiving at least a certain level of revenue every year to cover its debt service and operational costs. The district maintains that this approach, sometimes called "take or pay," assures that "the city that created the demand on the District's system is required to pay its fair proportional share of the increased cost to develop, operate and maintain supplies and facilities." In addition, this method is thought to be an impetus to the cities to carefully monitor their water use, and conserve in order to avoid increasing their maximum water volume.³⁰ With the expansion of water conservation efforts in recent years, however, and the attempts to lower per capita use in this area that has seen many years of rapid growth, **being locked into paying for a large volume of water is likely to be a disincentive to investing in strong water conservation programs to change behaviors of retail customers.** Changing the minimum annual demand billing method would require agreement by all of NTMWD's member cities and its board of directors.

Cities

City utilities are the water suppliers closest to the millions of water users who generate the Municipal sector demands seen in the regional water plans. In addition, the water use data collected by these entities helps generate the goals and targets in their water conservation plans, as well as the information in the required annual reports that track the progress of plan implementation. As mentioned earlier, the WCITF set the initial methods for measuring gpcd, and in addressing its task on the issue of "Targets and Goals for Per-

³⁰ North Texas Municipal Water District, "Background for Current Water Rate Methodology;" Interview and emails with James Parks, Executive Director/General Manager, NTMWD, July 27, 2012.

Capita Water Use,” recommended that the “Municipal Water Conservation Plans required by the state shall include [five- and ten-year] per-capita water use goals” considering the planned savings from the utilities’ conservation programs.³¹ **The Task Force’s overall recommendation was for the water conservation plans to have a goal to reduce total per capita use by 1 percent per year to get to 140 gpcd.**

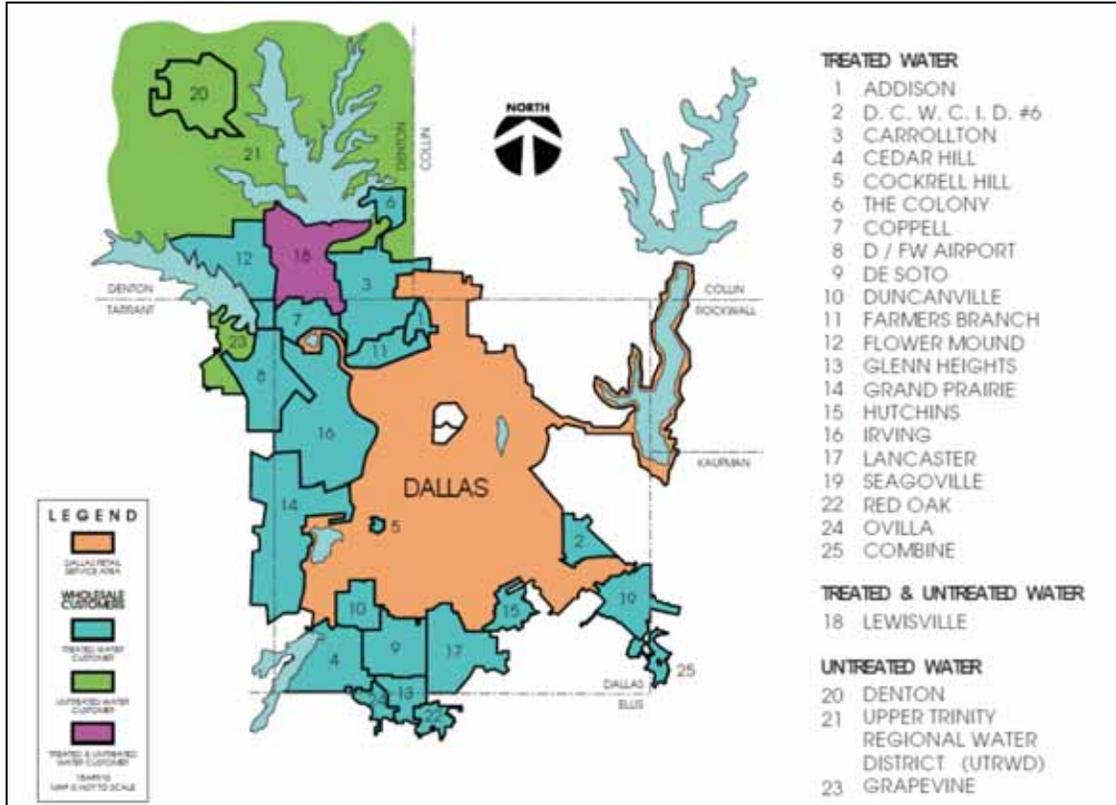
The remaining two of the top four major water suppliers in North Central Texas are also the titular cities of the Dallas/Fort Worth area, each with their own retail water utilities, along with wholesale customers.

Dallas: Dallas Water Utilities (**DWU**) is a major provider on both sides of the sales equation: third largest wholesaler in the state and seller of by far the most retail water, more than 284,000 acre-feet in 2006, roughly 92.6 billion gallons to Dallas households and businesses. The utility’s service area population is, obviously, large – 2.5 million, of which 1.3 million are Dallas residents and the other 1.2 million are served by DWU’s 27 wholesale customers. The customers are located in six counties, with the majority being in Dallas and Denton counties. [**Exhibit 8**] Because of this dual role as a water supplier, DWU is in a unique position on conservation, able to address the habits of water users large and small.

³¹ Texas Water Development Board, “Water Conservation Implementation Task Force – Report to the 79th Legislature,” pp. 4-5, http://www.savetexaswater.org/about/doc/WCITF_Report_2004.pdf

Exhibit 8

DWU Service Area



Source: Dallas Water Utilities

Likewise, the goals in Dallas' latest water conservation plan, adopted in 2010, reflect differences from the wholesale-only suppliers like Tarrant Regional and North Texas. While the goals include similar items, such as reducing water waste and being consistent with the Region C Water Plan, there were also goals of lowering seasonal peak demand and reducing consumption as shown by a decreased gpcd. In addition, because wholesale demand is a growing proportion of DWU's total, projected to reach 40 percent of all the utility's supplied water by 2050, Dallas' contracts with its wholesale customers require that

the customer develop a water conservation plan that includes “loss-reduction measures and demand management practices.”³²

Although Dallas began its first water conservation efforts in the 1980s, its current programs started building in 2001 when the city passed an ordinance prohibiting water waste in lawn and landscaping irrigation. As a follow-up to that ordinance, the city implemented a two-year public outreach campaign in 2002 to spread the word about the new rules. This grew into a full-fledged water conservation public education program that is still on-going; from 2002 to 2010, DWU spent a total of \$9.25 million on the program. The “Save Water, Nothing Can Replace It” tagline, as mentioned above, was adopted by Tarrant Regional Water District as they were developing their public outreach campaign in 2007, and then the two water providers merged their education efforts by combining their outreach budgets to have a regionally consistent message. The outreach program puts information about water conservation in television and radio ads, on billboards, and in newspapers, as well as maintaining a website, SaveDallasWater.com (for TRWD, the site is SaveTarrantWater.com).

Other parts of DWU’s water conservation program include:

- Free residential and commercial irrigation system inspections by conservation-licensed irrigators on staff
- Cooling-tower audits and recommendations for industrial, commercial, and institutional (**ICI**) customers with large cooling water use
- Water efficiency assessments for other ICI operations, such as food service, hotel/motel, or medical/laboratory facilities
- Free high-efficiency toilets to replace older, water-wasting residential units – called “New Throne for Your Home”

³² Dallas Water Utilities, *City of Dallas Water Conservation Plan*, June 2010, pp. 11, 14, 28, & 71, <http://savedallaswater.com/pdf/Dallas%20Water%20Conservation%20Plan.pdf>

- As of April 2012, a mandatory year-round maximum twice per week watering schedule

In 2010, DWU's Water Conservation Division had nearly 11 full-time staff. According to the conservation program manager, **Dallas has saved 146 billion gallons of water since 2001, or close to an average 45,000 acre-feet per year.** She believes that the first step of the water-waste ordinance, especially the time-of-day watering restriction, was "extremely effective in curbing water waste," and like her counterparts at the other major water suppliers, knows that changing behaviors is challenging, slow, and requires a continuing effort "to remind people that water is a precious resource ... [otherwise] people tend to go back to old habits."³³

The water conservation plan DWU updated in 2010 has, as required, 5- and 10-year targets for the utility's total gpcd. The 5-year target, for 2015, is in line with the Water Conservation Implementation Task Force's 1 percent annual reduction in gpcd; the target for 2020, however, shows only a one tenth of one percent improvement per year. **Even if DWU's plan had gpcd targets to consistently achieve the one percent reduction, Dallas would not reach the recommended goal of 140 gpcd until after 2050.** While it should be noted that the plan did not include reuse credits in their reduction targets, reused water was only about 26 percent of DWU's total water savings in 2011.³⁴

³³ Interview with Carole Davis, Water Conservation Program Manager, Dallas Water Utilities, August 3, 2012; Dallas Water Utilities, *City of Dallas Water Conservation Plan*, pp. 21, 23, 24, & 26, <http://savedallaswater.com/pdf/Dallas%20Water%20Conservation%20Plan.pdf>; and Save Dallas Water website, "Free Toilet Replacement Program" and "Industrial, Commercial, & Institutional (ICI) Program" sections, <http://savedallaswater.com/>.

³⁴ Dallas Water Utilities, *City of Dallas Water Conservation Plan*, June 2010, p. 11, <http://savedallaswater.com/pdf/Dallas%20Water%20Conservation%20Plan.pdf>; Texas Water Development Board, "Water Conservation Annual Report," Utility Data: City of Dallas Water Utilities, 4/20/2012.

Fort Worth: Essentially all of the more than 230,000 acre-feet of treated water that the City of Fort Worth sold to its customers in 2006 were first purchased raw from Tarrant Regional Water District. So, although Fort Worth is the fourth largest water supplier in Region C, it is unlike the other providers discussed above, in that the city does not operate any reservoirs or have permits to withdraw surface water for its use. It does have large-capacity water treatment plants, including wastewater plants serving Fort Worth and many of its wholesale customer cities.

Slightly more than 30 percent of Fort Worth's water sales are to wholesale customers – smaller suburban communities, mostly in Tarrant County, that serve a population of about 340,000 people. Some of these cities, it should be noted, have very high per capita water use. Fort Worth's contracts with these 30 customers require each of them to have a water conservation plan that they implement and update according to the state guidelines. The city also “encourages” the customer to have water savings goals that are similar to (within 10 percent of) Fort Worth's.

Similarly to the other major suppliers, Fort Worth has system-based conservation programs to address metering issues, and system water loss and efficiency. In 2009, the city did its first system water audit by the standard of the International Water Association, which it repeats every year. The audit allows Fort Worth to have more data with which to monitor “non-revenue water,” which includes water actually lost from leaks as well as “apparent losses” from meter or billing errors, or water use not charged for such as by the Fire Department.

On the retail side of its operations, Fort Worth's service area population is nearly 750,000 people. In its conservation plan, the city attempts to align its goals with the Best Management Practices (**BMPs**) guidelines that the state Water Conservation Implementation Task Force developed in 2004. Fort Worth has implemented a number of BMPs in its water conservation program, and plans to initiate more before the year 2015. The city passed a time-of-day watering restriction one year after adopting its 2005 water conservation plan; originally applied only from June through September, it was amended

in 2007 to become a year-round prohibition on water waste, with an added requirement for rain and freeze sensors on irrigation systems. Fort Worth also has established a tiered water-rate system to encourage conservation through cost signals of higher unit prices in the tiers for larger water use. Other conservation measures the city has implemented include:

- School education program - provides Waterama, Major Rivers, and Waterwise presentations to 4th and 5th graders in the 17 school districts within the city;
- Public outreach – implemented through bill inserts and brochures distributed at events.
- Free irrigation audits
- Save Fort Worth Water website (not related to Dallas and TRWD)
- SmartFlush toilet replacement – free high efficiency toilets

Residential water use surveys, landscape design and conversion, and assistance to wholesalers are among practices planned for the near future.³⁵

According to Fort Worth’s 2010 water conservation annual report, the SmartFlush program installed nearly 12,500 dual-flush toilets in the city. Also, in 2011, the utility saved a total of more than 3.6 billion gallons of water; however, reuse was responsible for the bulk of that water, with conservation accounting for only 1.3 percent of the savings. The previous year, conserved water was 2.4 percent of the total water saved by conservation and reuse. The utility’s spokesperson stated that the public’s awareness of the need for conserving water has grown, especially

³⁵ City of Fort Worth Water Conservation Plan, March 2009, pp. 3-4, 6-8, 12, 16, http://fortworthtexas.gov/uploadedFiles/Water/Save_FW_water/FinalWCP09.pdf

after the 2011 drought, but that Fort Worth faces the same challenges in continual education efforts to change people's behaviors.³⁶

Fort Worth's conservation plan gpcd targets match the Water Conservation Implementation Task Force standard of 1 percent reduction per year, with its reported 192 gpcd in 2008 going down to 179 gpcd by 2015, and 170 by 2020. Another of the utility's main "Performance Indicator Goals" pertains to water losses, gauged by a measure called Infrastructure Leakage Index, or ILI; Fort Worth maintains that its 2008 ILI number is "in the average zone of ILIs within the United States," and plans to reduce it by about 25 percent by 2020. **Both of these 2020 targets, however, will still be short of the levels the Task Force recommended as the final goal for the reductions. The city's gpcd number, with an annual 1 percent reduction, will not reach 140 gpcd until around 2040.**³⁷

Plano: It was beyond the scope of the research for this report to review the water conservation efforts of each of the numerous suburban communities in North Central Texas, most of which are customers of the wholesale entities examined. A case study of one of those suburban communities, however, illustrates some of the ongoing challenges in addressing water use in the region.

The City of Plano is representative in many ways of the dozens of suburban communities and metropolitan subsets, so to speak, that have mushroomed in the DFW Metroplex in recent decades. Not that Plano is a new city, but it remained a small farming community of fewer than 20,000 residents until the 1970s; by 2000 it had a population of 222,000. The

³⁶ Texas Water Development Board, "Water Conservation Annual Report," Utility Data: City of Fort Worth Water Department, 5/3/2012 and 4/19/2011; Interview with Mary Gugliuzza, Media & Communications Coordinator, City of Fort Worth Water Department.

³⁷ City of Fort Worth Water Conservation Plan, March 2009, pp. 3.

city's rapid growth has leveled off, and its population projections for the ten years from 2010 through 2019 predict an increase of fewer than 10,000 people.³⁸

Plano is one of the original member cities of the North Texas Municipal Water District (NTMWD). The city's staged water restrictions are initiated when NTMWD calls on its customers for demand reductions in response to a decrease in the district's supply availability (because of drought or a zebra mussel infestation in a water supply, for example). In addition, as explained earlier, as a district customer, Plano has a take-or-pay contract with NTMWD that requires the city to pay for a set minimum quantity of water. The amount is set to match the highest volume of district water that Plano has previously used in a year. Currently that amount is 26.7 billion gallons of water, or close to 82,000 acre-feet per year.³⁹

Plano's water conservation efforts are relatively new, with the city's first required water conservation plan having been adopted in March, 2010, although by statute it was supposed to be submitted to the state by May, 2009. The plan includes standard goals and measures for elements of water conservation, such as:

- Universal metering, meter maintenance – Plano has been replacing all meters with those capable of automated meter reading in recent years.
- Calculation and control of lost water amounts– Plano monitors and repairs leaks, and targets areas with frequent problems for pipe replacement. The goal is to keep unaccounted-for water below 12 percent of the total.

³⁸ Texas State Historical Association, "The Handbook of Texas Online: Plano, TX," <http://www.tshaonline.org/handbook/online/articles/hdp04>; Texas Water Development Board (TWDB), "Utility Profile: City of Plano," 4/1/2010.

³⁹ Interview with Mark Israelson, Director of Policy and Government Relations, July 27, 2012.

- Public education and information – the city has an education coordinator, sends out bill inserts, does presentations, and has a website with information and links to resources, including the Water IQ, Texas Smartscape, and NTMWD websites.
- Landscape watering – Plano’s goal is to “decrease waste in lawn irrigation.” The plan says the city is adopting “measures as required by NTMWD” whereby Plano “promotes a policy that restricts lawn irrigation between the hours of 10 am to 6 pm from April 1 to October 31;” “promotes” twice-a-week watering during those months and once-a-week for the months of November through March; and prohibits watering impervious surfaces or during rain or freezes. The city’s own landscape regulations require rain and freeze sensors, as well as a number of design and installation elements for new irrigation systems.
- Per capita use – the city’s plan sets out five-year and ten-year goals for its municipal gpcd. The plan, written in 2009, says that the current five-year average for Plano is 237 gpcd (excluding commercial and industrial use); the goal for 2014 is 225 gpcd, and for 2019 is 213 gpcd.

Plano has a tiered block structure for its water rates that the plan says “is intended to encourage water conservation and discourage excessive use and waste of water.” The blocks, however, are unlikely to send a strong conservation signal as structured. There are essentially only two (and a half) rate blocks: \$0.35 per 1,000 gallons for water use between 1,001 and 5,000 gallons (the first 1,000 gallons are included in the meter charge), and \$1.79 per 1,000 gallons beyond 5,000. The half block is for summer use, April through October – there is a charge of \$4.57

per 1,000 gallons for use of *more than* 20,000 gallons.⁴⁰ These rates are insufficient to create much incentive to reduce consumption. For comparison, see the table below:

Residential Water Consumption Charges

CITYC	CITTT@gallon@useC	CI ITTT@gallon@useC
ClanoC	CI TC9C	CC9T TC
CoTMDWoTMD	CCI T9TC	CI TTC9C
CusY9nC	CCI TCC	CTCTI 9C

Plano’s progress towards greater efficiency and less waste in its residents’ water use is not well demonstrated in its annual water conservation reports for 2010 and 2011. Despite the gpcd target of 225 for 2014, the city’s per capita usage in 2010 was 236 gpcd, and in 2011 was 241 gpcd. The amount of water saved in the two years averaged less than one percent of the total. Plano spent less than \$150,000 each of the two years on the water conservation programs; the city has also, however, paid NTMWD for more water than it used each year for the past decade.⁴¹

⁴⁰ City of Plano, *Water Management Plan*, March 8, 2010, pp. 13-20, 58, <http://plano.gov/SiteCollectionDocuments/City%20of%20Plano%20Water%20Conservation%20Drought%20Plan%20March%202010.pdf>

⁴¹ Texas Water Development Board (TWDB), “Water Conservation Annual Report,” Utility Data for the City of Plano, 3/28/2011 and 4/5/2012; TWDB, “Utility Profile for the City of Plano, 4/1/2010

Overview

Most of the cities in North Central Texas have some form of water conservation program; thanks to state requirements, all but the smallest communities have developed water conservation plans, and track and report on their implementation of those plans. Some of the suburban communities, such as the City of Allen, appear to have developed and are implementing extensive water conservation measures. But the State of Texas does not require that savings targets in municipal water conservation plans be ambitious, or that water suppliers and utilities push their customers to demand smaller volumes of water so that they will not need to develop new supplies as soon. Nor has Texas yet invested in a statewide public awareness campaign to help change attitudes and behavior about an irreplaceable resource, a campaign that would complement existing education efforts in North Central Texas and provide information where local efforts have not been established.

There has been change and progress in the past ten years on water conservation in North Central Texas, but the rate of change and progress has not been universal throughout the region. Moreover, much of the information evaluating the effectiveness of different water conservation measures implemented in North Central Texas is still anecdotal and in need of more empirical analysis. Nevertheless, water conservation is now a more prominent part of the water picture in the region than a decade ago. What could the next ten years bring?

The Future of Water Conservation in North Central Texas

Water is a finite resource, yet essential to life. In Texas, if all the river water already under permit for consumptive use were actually withdrawn, many of the rivers would cease to flow at certain times. We live in a state that is, on average, semi-arid, and subject to extreme swings in patterns of precipitation. Once a place of vast ranches and farms, and widely scattered small towns, Texas is now home to more than 25 million people, many of them living in some of the largest metropolitan areas in the country. The amount of water being used by an ever-larger population living in North Central Texas is enormous. Conserving water is critical to Texans' future.

In one way, Texas is ahead of the game – **the State Water Plan is unique and forward-thinking in trying to anticipate the needs of all sectors of water users and proposing ways to meet them.** Using a bottom-up, regionally based planning structure means that people with knowledge about the communities and water issues in their regions are gathering the data and deciding what is needed for the future well-being of the area. **The process also results, however, in regional plans that have little incentive to be conservative in projecting future demands for water and a state plan that amplifies that situation.** Once the estimated costs for the water management strategies in the state plan are totaled, Texans are presented with the news that some \$53 billion is needed to implement the plan. **Although there has been an increased emphasis on water conservation in state water policies over the last 10 to 15 years, what is needed is a clearly stated, financially supported, first priority in the state water plan to this cheapest and most available source of water supply.**

The successful implementation of water conservation programs in various communities is the best evidence that more can be done. Indeed, because many communities' and utilities'

efforts to conserve were only initiated within the last few years (after the first planning requirements), **there is every reason to believe that the amount of water saved through conservation programs will increase.** In addition, those programs can provide information about the best conservation practices that can be emulated by others to save more water, or reach established goals and targets.

Given this context, what additional steps should be taken to advance water conservation in North Central Texas through local, regional, and state action so that the full potential of conservation to meet water needs may be met? Some avenues that are worthy of pursuit are:

(1) Update and expand adoption of best management practices for municipal water conservation. The experiences of various water suppliers in North Central Texas in adopting and implementing best management practices for municipal water conservation should be incorporated into the update of the state Water Conservation Implementation Task Force's (**WCITF's**) *Best Management Practices Guide* now underway. The guide, produced in 2004, contains detailed descriptions of no fewer than 22 water conservation techniques for municipal water users (as well as practices for industrial and agricultural water users). Each best management practice (**BMP**) section includes information about which water user groups the BMP is appropriate for, details of all aspects and criteria of the practice, implementation steps and schedules, costs, what data should be collected about the program's progress, and how to determine the resulting water savings amounts.

The BMP guide is currently being updated by the state's Water Conservation Advisory Council (the successor to the WCITF), created by state legislation in 2007. Representatives from some of the wholesale and retail water suppliers in North Central Texas are participating in the update. That updating process will be most useful if it is accelerated and completed so that the revised BMP guide is available at least by the fall of 2013.

Water conservation plans required by state law from retail water suppliers and others must be revised every five years, and the deadline for submittal of the next set of revised plans is May 2014. Providing water suppliers with updated BMPs in time to be folded into that revision schedule will increase the chances that the revised conservation plans will reflect the state of knowledge about the effectiveness and appropriateness of various BMPs for different municipal water suppliers.

Each of the water suppliers in North Central Texas that are required to submit revised water conservation plans should review the updated BMPs and incorporate as many of those BMPs as appropriate to their individual circumstances in order to enhance the potential contribution of conservation to addressing their respective water needs.

(2) Establish more aggressive goals and targets for water use reductions in water conservation plans. For the many water providers, utilities, and cities required to develop and implement water conservation plans, the BMP guide can provide great help in deciding what practices to include in, or add to, their plans. The guide does not, however, advise groups on how ambitious or aggressive the goals should be for their programs. The diversity among the entities in North Central Texas with water conservation plans naturally leads to great differences in the goals and targets contained in those plans. But in light of the importance of conserving water in this area of large and growing municipal water use, there is an argument for water suppliers in Region C to set more ambitious – but reachable – goals and targets than are currently found in many of the water conservation plans of area suppliers. A clear example is the City of Plano, whose conservation plan targets for reducing water use, even if reached, would continue its current status as a heavy water user for years. With the array of proven conservation techniques available for municipal water suppliers, there is little justification for not making quicker progress in reducing water use than Plano has projected in its conservation plan.

(3) Implement well-funded statewide water education campaign and/or a region-wide water education program in North Central Texas: The water district and utility managers discussed in this report have all noted that changing people’s behavior in how they use water in their daily lives is challenging. The most prevalent strategy to accomplish this is to try to raise awareness, educating the public about the need for and practicality of saving water. Indeed, **it is challenging but necessary to reshape the public’s thinking about water, so as to deeply ingrain new habits.** One manager likened it to the seat belt campaigns, making saving water an automatic thing (and perhaps something your children would remind or nag you about). Another said that wasting water needs to become socially unacceptable. **The Water Conservation Implementation Task Force recommended a statewide public awareness program with “a design, scope, and budget comparable to those of the highly successful *Don’t Mess with Texas*” campaign.** The Task Force believed that such a program was essential and would not only bolster local and regional water conservation efforts, but also would be the basis for real progress in saving water to meet the state’s needs.⁴²

But such a well-funded, consistent, and penetrating statewide program has not developed. The state program, Water IQ, was established and is under the auspices of the Texas Water Development Board, but State funding for the program has never been provided. The program, where it is used, depends on local funding and/or private spending, but that severely limits its scope and impact.

⁴² Texas Water Development Board (TWDB), “Water Conservation Implementation Task Force Report to the 79th Legislature,” November 2004, p. 3,

http://www.savetexaswater.org/about/doc/WCITF_Report_2004.pdf

In Region C, multiple outreach and education efforts send different messages to different subsets of the whole population. North Texas Municipal Water District, for example, has used Water IQ within its service area, with apparent success in impacting water use, but other suppliers have taken other approaches. The coordination by the Dallas Water Utilities (DWU) and Tarrant Regional Water District (TRWD) on their conservation awareness campaigns shows that “one voice, one message” is possible from different sources. These water suppliers, in their combined outreach budget expenditures, concentrate on the common elements of their separate conservation programs; there are many messages that all education packages need get to water users in the area if behavior changes are to be widespread. Region C, or perhaps some other regional entity, could help to **coordinate an effort to bring a region-wide consistency to the public education efforts to establish good water conservation habits.**

(4) Continue, enhance, and provide State support for regional coordination of water conservation efforts in North Central Texas. There is an existing example in North Central Texas of a group of cities, suppliers, and other water-involved organizations coming together to collaborate on water conservation issues on an informal basis. **The Water Efficiency Network of North Texas (WENNT)** formed after the 2005 drought that lasted into early 2007. Because North Texas water districts and municipalities had to activate drought contingency plans and water restrictions suddenly to respond to the rapidly worsening water supply situation, the area faced an urgent need to alert and inform the public quickly and effectively. Afterwards, the large amount of new information available about programs, effectiveness, materials, and methods of outreach, plus the realization that water conservation was an ongoing necessity, inspired what was at first a small group of cities to come together to share experiences and knowledge.

Several years later, WENNT continues to meet monthly and has, in addition to working to find effective means of communicating with the public about conservation, also collaborated on the funding and production of a booklet-like brochure and how-to videos

on efficient landscape irrigation. WENNT's educational efforts include workshops and trainings in the region as well; their model is being duplicated in other locations in the state.

WENNT's efforts would be augmented and supported if the State of Texas pursued adoption of certain recommendations by the state Water Conservation Implementation Task Force. In 2004 the Task Force considered and unanimously endorsed the concept of **state-funded incentives in the form of grants, recognition awards, and cost-sharing to support effective and innovative water conservation programs.**

The Task Force specifically recommended that there be **new Regional Conservation Coordinator staff positions at the Water Development Board "to work directly with Planning Groups and water-supply entities in the regions."**⁴³

Having such incentives and dedicated staff could aid networks such as WENNT and accelerate the coordination and cooperation needed to 'regionalize' water conservation in areas such as Region C.

(5) Promote consistent water conservation measures in the region through similar municipal ordinances. Another element of consistency that would increase water savings across the region pertains to city ordinances. While it is unrealistic to expect all Metroplex cities to have the same regulations about water conservation, **it is also problematic for cities not to have even basic ordinances that promote water conservation by their residents and businesses.** Prohibiting water waste, when landscape watering is still such a large use, should be universal; **time-of-day limits have made a very large impact wherever they have been put in place.** Retail water pricing, while specific to suppliers, should always be structured to promote conservation; **flat water rates for any and all volumes of use, no matter how**

⁴³ TWDB, "Water Conservation Implementation Task Force Report to the 79th Legislature," November 2004, pp. 3-4.

large, send a message that counters every existing public awareness effort on water conservation.

Getting different governments or governing bodies to come together and reach agreement on imposing the same new regulation, or making a change to existing rules affecting multiple entities is difficult, of course. A

very recent illustration in North Central Texas can be found in an effort to establish ongoing limitations on outdoor landscape watering. In April the City of Dallas adopted a year-round twice-per-week maximum watering schedule. Originally, under the leadership of their respective mayors, four cities were going to make that move, not only Dallas but also Arlington, Fort Worth and Irving. Thus far, the city councils of the other three cities have not acted.⁴⁴ Adopting a similar ordinance restricting outdoor landscape watering in several cities, however, would make it much easier to promote a consistent public education message to residents of the area through common media markets.

(6) Consider alternatives to the use of “take-or-pay” contracts for the sale of water from wholesale providers to retail water suppliers. It seems evident from Plano’s example that North Texas Municipal Water District’s **minimum annual demand contracts can have, at the least, a dampening effect on full commitment to conserving water** in the district’s customer cities. The state Water Conservation Implementation Task Force in 2004 recommended, and the Texas Legislature in 2005 directed, that the Texas Water Development Board do a study of take-or-pay contracts to see if they affect water conservation efforts.⁴⁵ The report was done under contract to the Board in 2006, but the Board staff deemed its results to be

⁴⁴ Rudolph Bush, *Dallas Morning News*, “Dallas only city so far to act on mayors’ water-saving pledge,” May 18, 2012, <http://www.dallasnews.com/news/local-news/20120518-dallas-only-city-so-far-to-act-on-mayors-water-saving-pledge1.ece>.

⁴⁵ Texas Water Development Board, “Water Conservation Implementation Task Force Report to the 79th Legislature,” November 2004, p. 8.

inconclusive – in part because a survey of water suppliers indicated split opinions about whether such contracts affected water conservation.⁴⁶ Nevertheless, it is an assault on common sense to think that having to pay for a certain amount of water whether you use it or not has no impact on a retail water supplier’s interest in pursuing aggressive water conservation. How does a retail water supplier amass sufficient revenues to pay for all that water unless it has the water sales to provide that revenue?

⁴⁶ Texas Water Development Board, “A Report on the Effect of Take-or-Pay Contracts on Water Conservation,” December 2006.

Conclusion

The Region C and state water plans and other documents make it clear that in the last decade attention to and achievements of water conservation in North Central Texas have increased significantly. **Many people, including many of those involved in providing water supplies in North Central Texas believe, however, that significantly more can and should be done to advance water conservation in the region.**

There are certain cities in other regions of Texas that are often cited as prime examples of water conservation programs, and on-target per capita use numbers. Unfortunately, and perhaps unfairly, cities in North Central Texas are sometimes portrayed in a very different light. There is no reason why that impression cannot be changed with vigorous commitment to saving water, exemplary cooperation, and shared effort by those communities.

North Central Texas has made progress on water conservation, and certain developments such as the Water Efficiency Network of North Texas have become models for advancing water conservation in other parts of the state. But clearly the potential for achieving much greater progress on water conservation in the region exists. A mix of local, state, and regional actions are available to reach that potential, to the benefit of the water future of not only the region, but the entire state of Texas.

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The goals of the project are to:

- ensure adequate water for people and environmental needs,
- foster efficient and sustainable use of current water supplies, and reduce future demand for water,
- educate the public and decision makers about the impact of wasteful water use and the opportunities for water conservation, and
- involve citizens in the decision-making process for water management.

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