

**AN OVERVIEW OF THE DALLAS-FORT WORTH AREA'S LONG-TERM
WATER AND TRANSPORTATION NEEDS**

Prepared for the North Texas Future Fund

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I. A SUMMARY OF THE REGION'S WATER NEEDS

Water is the ultimate resource. Recognizing the importance of a reliable long-term water supply, the DFW region has invested heavily in reservoirs and transmission facilities over the past 50 years. Indeed, the dramatic population and employment growth enjoyed by the Metroplex over the past several decades would not have occurred absent an abundant and reliable supply of fresh water for residential and commercial uses.

Despite the foresightedness of the region's leaders, according to the Texas Water Development Board the region may soon find itself facing a water deficit. In short, demand is projected to grow faster than supply (see Table 1). By the year 2010, the deficit could be 272,000 acre-feet, and by 2050 the deficit could reach 1.1 million-acre feet per year—and amount greater than total current demand. Not surprisingly, the largest potential deficits are in the largest counties.

Table 1

Municipal Water Demand Projections for 2000-2060

(in acre-feet per year*)

County	D2000	D2010	D2020	D2030	D2040	D2050	D2060
Collin	129,603	202,093	277,630	329,895	391,260	449,184	513,544
Dallas	565,147	652,093	720,675	763,391	805,182	873,942	974,789
Delta	815	853	906	961	1,022	1,019	1,019
Denton	89,062	156,727	206,870	258,013	302,113	347,705	400,328
Ellis	19,820	27,008	33,645	41,126	49,430	59,502	71,808
Henderson	11,404	14,094	16,312	18,461	20,615	23,472	27,154
Hunt	12,922	13,693	15,182	17,282	20,795	28,913	41,683
Johnson	21,507	26,359	31,014	36,048	41,845	49,292	58,055
Kaufman	10,276	17,657	24,154	28,667	32,828	37,592	43,715
Parker	12,621	18,498	30,052	38,735	43,242	47,970	52,470
Rockwall	9,046	18,446	29,349	34,721	39,397	42,521	44,415
Tarrant	12,621	18,498	30,052	38,735	43,242	47,970	52,470
Wise	6,617	10,456	14,544	17,868	20,955	24,915	29,288
Total	890,419	1,160,207	1,409,289	1,598,690	1,782,950	2,000,148	2,271,174

Source: Texas Water Development Board

*An acft is an amount of water to cover one acre with one foot of water and equals 325,851 gallons.

Table 1 cont'd

Surplus or Need By County Using Only Connected Supplies

(in acre-feet per year*)

County	2000	2010	2020	2030	2040	2050
Collin	23,020	(29,794)	(80,743)	(124,769)	(174,124)	(210,431)
Dallas	(34,250)	(168,112)	(241,696)	(267,472)	(350,525)	(415,879)
Denton	3,108	(20,744)	(92,987)	(184,125)	(210,954)	(234,983)
Ellis	6,935	(10,542)	(13,252)	(17,304)	(21,678)	(23,346)
Kaufman	2,620	(1,024)	(3,566)	(7,921)	(10,145)	(17,119)
Parker	(1,613)	(11,469)	(15,008)	(24,715)	(30,336)	(33,874)
Rockwall	2,941	(6,362)	(10,849)	(15,603)	(21,694)	(28,106)
Tarrant	30,270	(25,625)	(79,466)	(109,210)	(147,498)	(174,233)
Wise	11,531	(1,722)	(3,429)	(6,126)	(7,981)	(9,418)
Total	35,031	(271,662)	(535,547)	(749,089)	(964,914)	(1,135,921)

Source: Texas Water Development Board

*An acft is an amount of water to cover one acre with one foot of water and equals 325,851 gallons.

The deficits assume, of course, that no additions are made to the region's water-holding and transmission capacity. In fact, the region's cities, counties, and water districts have planned investments approaching \$6 billion through the year 2040 (see Table 2). As with the region's education infrastructure, assuring an adequate water supply will entail careful long-range planning and a serious financial commitment by all counties, municipalities, and water districts in the North Texas region.

Table 2

Capital Costs for Recommended Water Management Strategies through 2025

Major Water Provider/County	Estimated Capital Cost
Major Water Providers	
Dallas Water Utilities	\$1,492,649,000
Tarrant Regional Water District	1,167,652,000
North Texas Municipal Water District	1,435,447,000
Fort Worth	221,475,000
Trinity River Authority	166,081,000
TOTAL FOR MAJOR WATER PROVIDERS	\$4,483,304,000
Others (by County)	
Collin	\$14,371,000
Dallas	553,801,000
Denton	581,277,000
Ellis	15,232,000
Kaufman	29,912,000
Parker	83,017,000
Rockwall	4,795,000
Tarrant	83,452,000
Wise	68,483,000

Source: Texas Water Development Board

A more detailed description of the region's water needs can be found in Appendix A.

II. MOBILITY AND TRANSPORTATION INFRASTRUCTURE FOR THE METROPLEX THROUGH 2025

The Mobility 2025: Metropolitan Transportation Plan is a comprehensive, multimodal, plan to help meet the growing transportation needs of residents in the D/FW Metroplex. The plan is the result of cooperative planning efforts between the Metroplex's local community governments and transportation groups like Dallas Area Rapid Transit (DART), Fort Worth Transportation Authority (The T), Texas Department of Transportation (TxDOT), North Texas Tollway Authority (NTTA), Texas Natural Resource Conservation Commission (TNRCC), and the Dallas/Fort Worth International Airport. The plan encompasses strategies to deal with congestion management, pedestrian and bicycle facilities development, regional rail and bus system development, HOV and managed facility development, Freeway/tollway system development, regional arterial system development, and intermodal/freight transportation development.

The entire plan will cost more than \$49 billion, as summarized in Table 3. Federal and state motor fuel taxes, state vehicle registration fees, dedicated transportation authority sales taxes, tollway revenue, and local government bond programs will be the primary sources of funding for this transportation plan. Nonetheless, the total revenue shortfall is estimated at \$3.3 billion by 2025. Here again, the region will be challenged to come up with the requisite local financing to ensure transportation mobility in the future.

Table 3

Mobility 2025: Financial Summary

Metropolitan Transportation System Components	Cost (Millions/2001\$)	% Total
Operation & Maintenance	\$18,078	37%
Congestion Mitigation Strategies	2,014	4
Bicycle & Pedestrian Facilities and Transportation Enhancements	960	2
Rail and Bus Transit System	8,653	18
HOV and Managed Facilities	2,115	4
Freeway and Toll Road System	11,528	24
Regional Arterial and Local Thoroughfare System	5,677	11
Total	\$49,025	100%

Source: Mobility 2025 Plan Update

A more detailed description of the *Mobility 2025:Metropolitan Transportation Plan* can be found in Appendix B.

APPENDIX A: Detail of DFW Future Water Needs

Definitions

Water availability is the maximum volume of water for use from current water source during drought of record conditions.

Water supply is the volume of water apportioned from each currently existing, connected, and accessible water source, during drought of record conditions.

A source can be used as a supply if it is connected, has the infrastructure in place currently to be used. Supplies that are not connected would include lakes for which there is no current pipeline.

Water Demand Projections

Municipal demand includes commercial, institutional, and residential water uses but does not include manufacturing use.

Factors that increase municipal water use in the region:

- New developments of large houses with large lots, sprinkler systems, swimming pools, and other water using amenities.
- The number of people per household is decreasing. Causes and increase in per capita use because household uses are spread over fewer people.
- Communities are experiencing rapid commercial development, increases per capita use.

Current Water Supply and Projected Demand

In 2000 Dallas and Parker show a net need for immediate additional supplies when all demands and all connected supplies are totaled. The largest water needs are in Collin, Dallas, Denton and Tarrant Counties.

By 2010, Collin, Dallas, Denton, and Tarrant counties will have a combined shortfall of 242,256 acre-feet, utilizing current demand projections.

From 2000-2020 Collin County is projected to experience a 46.7% increase in municipal water demand.

Capital Costs Major Water Utilities

Dallas Water Utilities

To meet the projected municipal water demands the Dallas Water Utilities will need to spend a total of \$1,492,649 in capital costs. These projects include connecting Lake Fork and Palestine, providing an additional 329,000-acre feet/year, with a cost of \$288,000,000 and \$322,600,000 respectively. Various treatment plant expansions are also required costing \$395,233,000. The Marvin Nichols project with a projected start date of 2030 has a cost of \$352,326,000(Dallas Water Utilities Share). Extending the Elm Fork permit and reuse projects total \$124,500,000. These projects are based on 1999 construction costs with a time frame from 2004 to 2040, proving a total of 419,900 acre/feet/year.

Tarrant Regional Water District

Tarrant regional water management strategies include the Cedar-Richland Pipeline expansion beginning in 2005 with a capital cost of \$24,681,000, providing an additional 110,000-acre feet/year. Developing the West Fork Connection to allow water to be transferred among parts of the water supply system costing \$60,539,000. A reuse project to pump water from the Trinity River into Cedar Creek Lake and Richland –Chambers Lake will provide an additional 115,500-acre feet/ year with a cost of \$75,168,000. There are additional water sources in Oklahoma that are projected to be developed by 2010 providing an additional 12,000 acre feet/year with a cost of \$99,931,000. A third pipeline into East Texas is projected to begin in 2015 with a cost of \$233,967,000 bringing an additional 156,000-acre feet/year. The Marvin Nichols project is also included beginning approximately 2030, costing \$637,366,000 bringing an additional 395,500-acre/feet year.

North Texas Municipal Water District

The North Texas Municipal Water Districts management strategies include additional reuse, costing \$1,000,000 while providing an additional 35,900-acre/feet year. Various water treatment plant expansions and improvements costing \$801,455,000 are necessary to expand the water supply. The development of additional water in Texoma, other Oklahoma water, and the Lower Boise d' Arc Creek Lake and Transmission system are approximated to begin by 2014 with a costs of \$5,286,000, \$68,777,000, and \$167,324,000 while bringing a total of 10,000, 50,000, and 98,000 acre feet/ year. The Marvin Nichols project is also slated to begin in 2030 with a cost of \$391,605,000 with an additional 163,300-acre feet/year.

Fort Worth

The city of Fort Worth obtains essentially all of its raw water from the Tarrant Regional Water district. Fort Worth essentially provides treated water to its citizens

and a number of water suppliers in Tarrant County. The estimated capital costs for Fort Worth’s water treatment plant expansions between now and 2050 total \$221,475,000.

Trinity River Authority

The Trinity River Authority will continue to develop use projects and expand raw water transmission. The projects will include additional landscape irrigation and reuse for municipal supply in Dallas County through Joe Pool Lake and Lake Grapevine. These projects have an estimated capital cost of \$166,081,000, proving an additional 81,500-acre feet/year.

Counties

- Collin County water user groups will continue to obtain treated water from North Texas Municipal Water District
- Collin County water suppliers will temporarily overdraft groundwater while developing surface supplies
- Dallas will continue to obtain treated water from Dallas Water Utilities and North Texas Municipal Water District
- Irving will complete facilities to bring its water supply from Lake Chapman to Lake Lewisville for treatment by Dallas and use by Irving
- Current groundwater use in Denton County exceeds Texas Water Development Board’s estimated long term reliable supply
- Ellis County water users will temporarily overdraft groundwater while developing surface supplies

Surplus or (Need) for Each Major Water Provider

Major Water Provider	Surplus or (Needs) in Acre-Feet per year					
	2000	2010	2020	2030	2040	2050
Dallas Water Utilities	(72,986)	(126,101)	(37,314)	21,833	2,866	(7,113)
Tarrant Regional Water District	12,797	(55,335)	(51,528)	(77,643)	(95,108)	(120,856)
North Texas Municipal Water District	34,253	(46,236)	(120,083)	(182,555)	(245,377)	(294,686)
Fort Worth	10,665	(9,025)	(6,288)	(15,075)	(25,665)	(35,373)
Trinity River Authority	(5,652)	(43,403)	(43,454)	(47,901)	(51,682)	(54,674)

Source: Texas Water Development Board

- Notes:
- a. As required by TWDB guidelines, all contracts with major water providers are treated as demands even if actual use is not expected to occur until later decades. This results in exaggerated demands (and needs for water) in early decades.
 - b. As required by TWDB guidelines, demands are assumed to disappear as current contracts expire. This results in understated demands (and needs for water) in later decades.

APPENDIX B: Summary of Mobility 2025

Congestion management:

- Travel Demand Management – focuses on reducing the number of vehicles traveling on the roadways through the promotion of programs such as employer trip reduction programs, vanpool programs, and park-and-ride facility development.
- Transportation System Management – Focuses on the improvement of existing transportation systems through intersection improvements, traffic signal enhancements, and removal of freeway/arterial bottlenecks.
- Intelligent Transportation System – A comprehensive system update plan that will utilize closed circuit television, lane control signals, dynamic message signs, ramp meters, mobility assistance patrols, and traffic flow detectors to notify to provide “real-time” notification to drivers.

Pedestrian and bicycle facilities development:

- The mobility 2025 plan provides a more cohesive approach to planning, developing, and constructing the pedestrian and bicycle component of the regional transportation plan. The plan will implement improvements for the regional Veloweb system (a 306 mile system of off-street bicycle facilities), an on-street bicycle improvement program, and pedestrian and bicycle transportation districts at a cost of approximately \$754 million.

Regional rail and bus system development:

- Mobility 2025 proposes to expand existing rail and bus lines to create a region-wide public transportation system. The plan proposes the addition of 77 miles of light rail, 152 miles of commuter rail, 141 miles of rail in a yet undefined location, and 25 miles of special event service to Texas Motor Speedway. The total cost for this plan would be \$8.6 billion

HOV and managed facility development:

- In order to take full advantage of the HOV capacity, the 2025 plan calls for some revisions to the program. The first strategy is to create reversible HOV lanes to accommodate directional commuter traffic at its heaviest, two-way facilities will be used where traffic is heavy in both directions during peak times. The second strategy is to create a toll environment at the HOV lanes charging a higher toll for non-HOV users and a lower (or no toll) for HOV users. The plan calls for the construction of 600 lane miles of HOV/ managed facilities for \$2.1 billion

Freeway/tollway system development:

- The plan calls for the addition of 2,479 lane miles of new freeway/tollway capacity. The cost for this would be \$11.5 billion with \$1.3 billion coming from tolls and user fees.

Regional arterial system development:

- The plan estimates that travel of regional arterials will increase by 48% by the year 2025 and calls for the improvement of 1,731 miles of regional arterials.

This will cost approximately \$3.1 billion. The plan also calls for \$2.6 billion in additional funds for other arterial improvements.

Intermodal/freight transportation development:

Though no concrete plans or funds have been made available to this section of the plan, intermodal/freight transportation is considered to be important an important element in the region. As more funds become available, strategies to improve the mobility and safety of this sector will be explored.