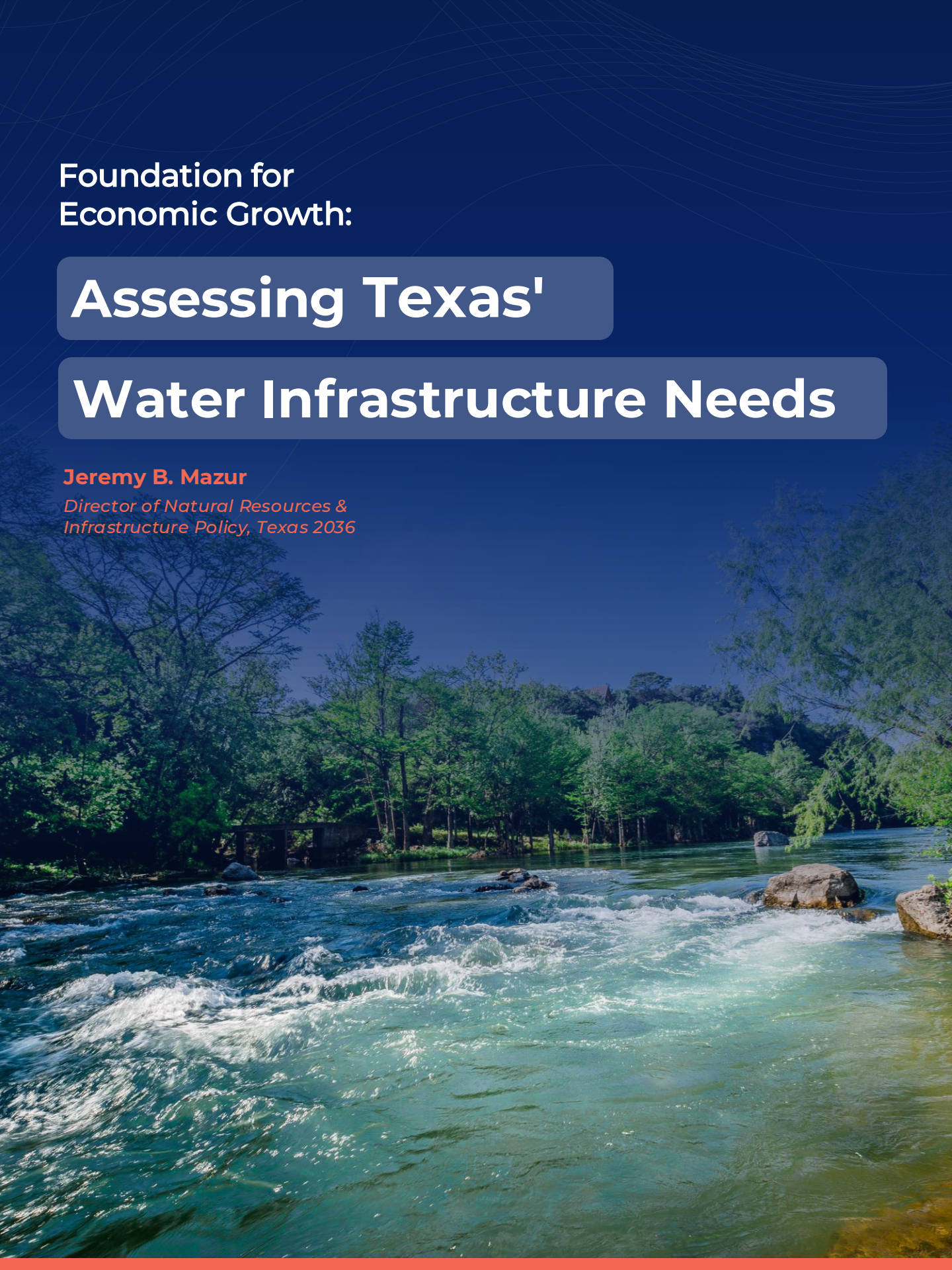
Foundation for
Economic Growth:

Assessing Texas' Water Infrastructure Needs

Jeremy B. Mazur
Director of Natural Resources & Infrastructure Policy, Texas 2036



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Executive Summary

In 2024, a Texas business ceased to exist because of a water shortage. Diminishing water supplies fueled by regional drought in the Rio Grande prompted the Santa Rosa sugar mill to close after 50 years of operation. The closure came at the cost of 500 jobs and hundreds of millions of dollars of economic activity.

The story of what happened in the Rio Grande serves as a cautionary tale about the state's relationship between water infrastructure and economic growth and development. In the same year that the Santa Rosa sugar mill closed forever, the cities of Conroe, Dripping Springs and Magnolia grappled with water infrastructure's controlling limits to continued growth.

Just as water can limit economic growth opportunities, it opens the door for them as well. In north Texas, the City of Sherman approved $500 million in infrastructure investments, including those for a wastewater facility, in order to support Texas Instruments' plans to build a $30 billion manufacturing plant.[1] In Central Texas, the City of Taylor, with an eye towards becoming a new regional tech hub, worked to secure reliable water supplies for Samsung's $17 billion semiconductor facility.[2] Meanwhile, the growth and expansion of other key industries, including downstream refining, data centers, and housing construction, to name a few, are supported by the reliability of water infrastructure.

Water infrastructure serves as one of the three core pillars of economic growth and development. The other pillars include reliable electricity service and a qualified workforce. Just as the continuation of the Texas economic miracle depends on electric reliability and workforce competency, it also relies on water infrastructure. Conversely, water infrastructure failure, like the loss of electric reliability or the absence of a competent workforce, threatens to topple any economic growth and development objective. State and local investments in water infrastructure are, by extension, economic development efforts.

Three Pillars Supporting Texas' Economic Growth & Development

[1] Erin Pellett, "The TI Effect: $500 million worth of projects in Sherman to prepare for manufacturing plant" KXII News, May 14, 2024.
[2] Tina Bellon, "How a little Texas town snagged a $17 bln Samsung chip plant deal" Reuters, November 21, 2021.

// EXECUTIVE SUMMARY

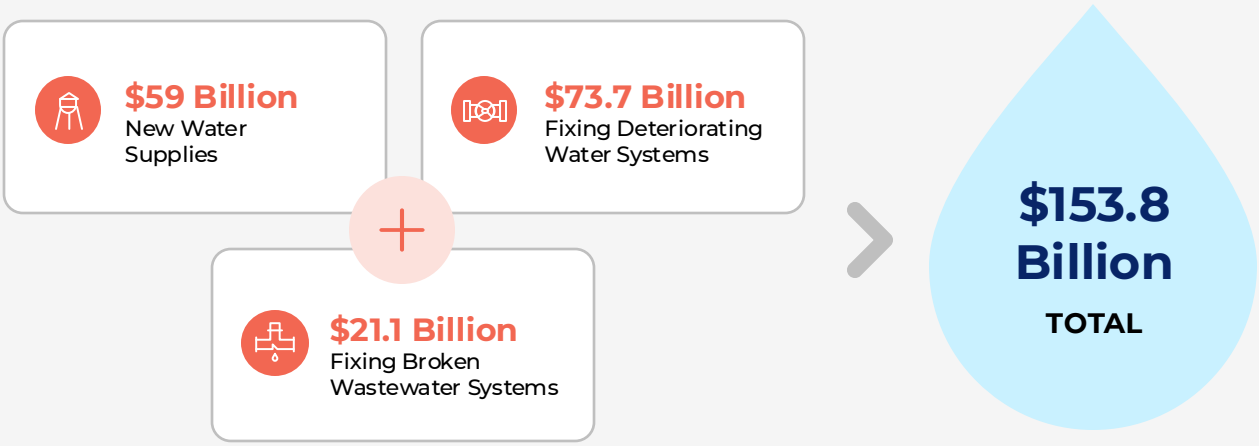
Despite water infrastructure's salience for economic growth and development, Texas faces two critical challenges. The first involves the need to expand its water supply portfolio for a drought-prone and growing state. Here, Texas faces a long-term water supply deficit of nearly 6.9 million acre-feet of water. If Texas fails to develop the broad, diversified water supply portfolio needed for the next prolonged, severe drought similar to that of the 1950s, then as soon as 2030 the state will endure $160 billion in annual GDP losses, nearly 800,000 jobs lost, and an exodus of families seeking refuge – and water – elsewhere. These consequences exceed – and by some metrics equal – those observed in Texas during the Great Recession of the late 2000s and the COVID-19 pandemic. This water supply deficit will also have a direct impact on the state's electricity generation capacity: low water supplies due to droughts could impede dispatchable generation from natural gas, nuclear and coal-fired plants, costing hundreds of millions, and possibly billions, of dollars in economic damages per day.

Texas' second water infrastructure challenge involves addressing the problems attributable to aging, deteriorating water and wastewater infrastructure. Recent headlines about boil water notices, broken water pipes and failing systems are indicative of water systems that are both deteriorating and operating past their useful life. The daily inconveniences and sometimes life-altering effects of water system failures – including families scrounging for bottled water, schools closing due to a boil water notice, and even business closures – represent thousands of small economic cuts that translate into a meaningful wound to Texas' economic well-being. Barring a significant intervention through new investment, over the next 15 years aging, deteriorating water and wastewater systems will contribute to nearly $320 billion in GDP losses for Texas – an amount equal to the size of the state's current two-year budget.

State and federal policymakers have made attempts to address these water infrastructure challenges. In 2013 and, more recently, in 2023, both the Texas Legislature and state voters approved the creation of new funds aimed towards developing water supplies and addressing infrastructure needs. Congress, for its part, approved the US Infrastructure Investment and Jobs Act (IIJA) in 2021, which temporarily course-corrected decades of declining federal spending on state and local water infrastructure. Unfortunately, Texas' share of IIJA gains have since been eroded through the use of Congressional earmarks for other water projects. Since 2022, this practice has resulted in a net loss of $105 million in federal funding for Texas' water infrastructure needs.[3]

Despite these funding efforts, a substantial funding gap exists between Texas' long-term water infrastructure funding needs and the projected state and federal funding effort. Based on inflation-adjusted cost estimates within the 2022 State Water Plan and the Environmental Protection Agency's community needs surveys for drinking and wastewater utilities, Texas will need to spend at least $154 billion over the next 50 years in order to sufficiently address its water supply and deteriorating infrastructure challenges. State and federal water funding programs, including the recently-created State Water Implementation Fund for Texas and the Texas Water Fund, are projected to provide approximately $40-45 billion in financial assistance in the coming decades. This leaves a long-term funding gap of over $110 billion for Texas' water infrastructure.

Texas' 50-Year Water Infrastructure Financial Assistance Needs

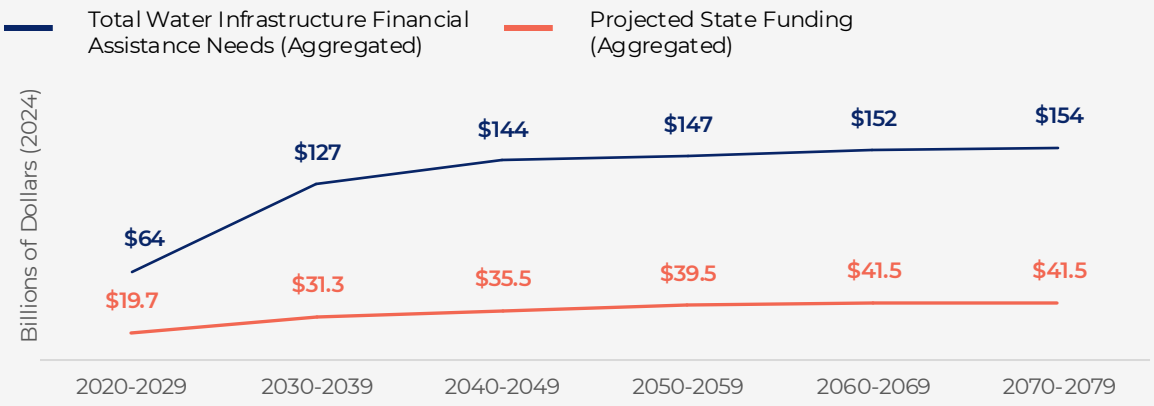


Sources: 2022 Texas State Water Plan, US EPA. Cost estimates reflect 2024 values.

[3] Council of Infrastructure Financing Authorities (CIFA), Impact of Congressional Earmarks on Annual Federal Funding for Water Infrastructure, 2024.

Texas' Water Infrastructure Funding Gap (2020-2079)

Based on Existing Inflation Adjusted Cost Estimates and Projected Funding Efforts



Failing to address this funding gap invites economic peril, endangering both the premise and promise of the Texas economic miracle.

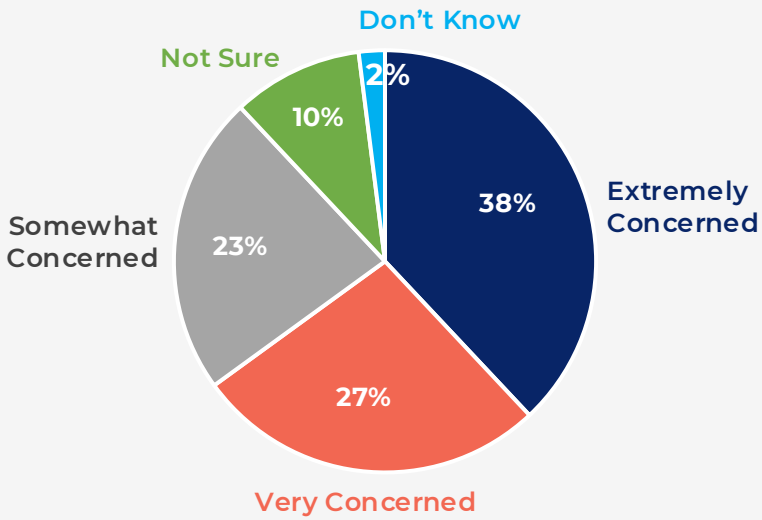
State policymakers have an opportunity to enact meaningful changes to the state's financial strategy for addressing Texas' long-term water infrastructure challenges. The basket of policy solutions available to state leaders includes increasing the endowment for the state's water funds and, more critically, establishing a revenue stream dedicated to those water infrastructure funds. Stable, reliable funding empowers long-term strategic planning and works towards addressing the state's escalating water infrastructure liabilities. Moreover, this financial strategy builds on the successful models that both the Texas Legislature and state voters have approved for funding state highways and parks.

A sustained financial strategy for water infrastructure development proves essential for two reasons. First, and as referenced above, water infrastructure investments will work to avoid severe economic consequences for Texas, including billions in GDP losses, hundreds of thousands of people losing the dignity of employment, and genuine hardships for Texas' families and businesses. Second, and perhaps strategically more important, reliable water infrastructure provides the essential foundation for continued economic growth and prosperity. As this report describes, water infrastructure investments could support billions of dollars in economic growth and development per year, and generate as many as 15 jobs for every million dollars invested. Moreover, the State of Texas has spent billions of dollars on transportation, parks, broadband, public education, health care and energy. The continued success of the state's investments in these areas depends on the reliability of water infrastructure.

Texas has the capacity and the capability to address its long-term water infrastructure challenges. The state's recent history of strategic infrastructure investments, forward-looking water planning processes and a robust water industry are indicative of strong, native assets that offer a firm foundation for long-term success. While this report includes detailed data on potential water shortages during drought, the conditions of aging and deteriorating water and wastewater systems, projected funding gaps and the economic consequences of not having sufficient infrastructure, Texas has the wherewithal to address these challenges. Indeed, the current Texas economic miracle serves as testament to the success of our water infrastructure to date. State investments in water infrastructure will help propel this miracle in the decades to come.

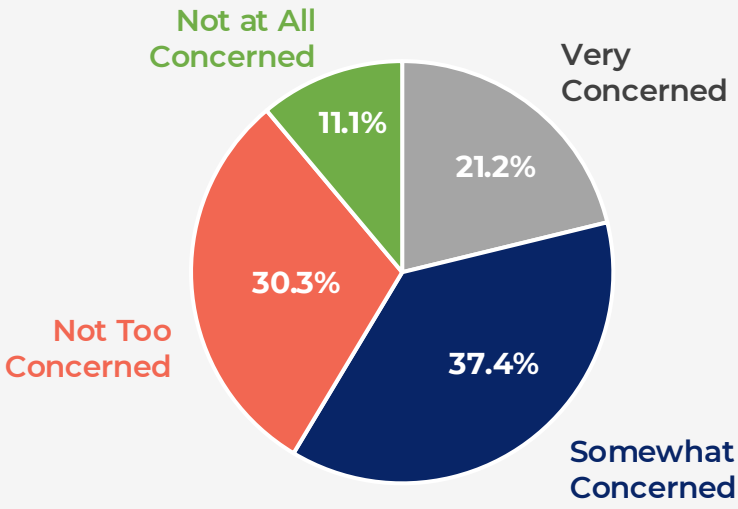
Texas Voters' Concerns About Water

How concerned are you that if a severe drought occurs, then Texas will not be able to meet a significant amount of its water needs, meaning some communities may not have any access to water.



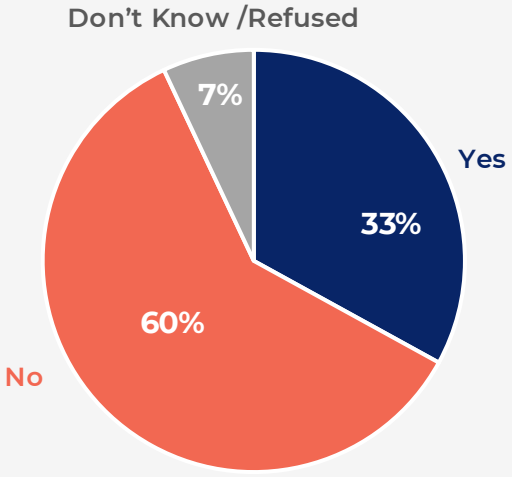
Source: Texas 2036 Voter Poll

How concerned are you about the reliability of the water supply in your community?



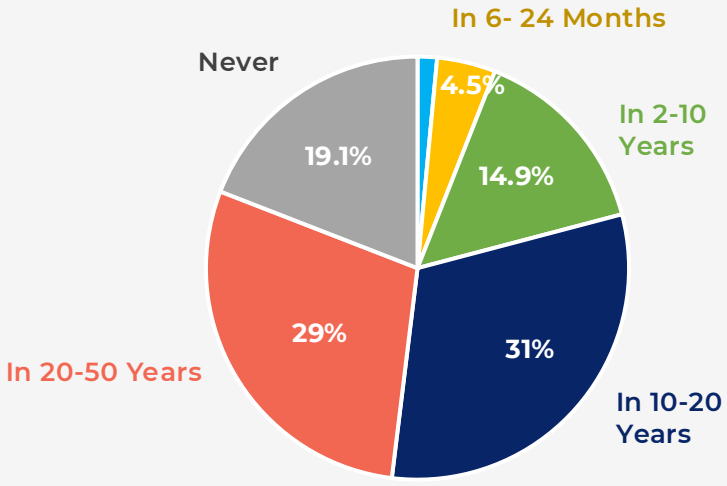
Source: Texas Lyceum Poll (2024)

Have you experienced a boil water notice or notification of unsafe tap water in the past year?



Source: Texas Lyceum Poll (2024)

To your best knowledge based on current and projected information, when will your (rural water) system run out of water?



Source: Texas Rural Water Association Survey (2024)

CHAPTER 1

Texas' Long-Term Water Infrastructure Challenges:

The Need for More Water Supplies and the Problem of Aging, Deteriorating Water and Wastewater Systems

The continuation of the Texas economic miracle hinges on the reliability of its water infrastructure. This includes water supplies and drinking water treatment and wastewater systems. Texas faces two critical challenges here. The first involves the need to expand the state's water supply portfolio given the threat of drought and the demands attributable to population and economic growth. The second challenge involves the significant and escalating problem associated with aging, deteriorating water and wastewater systems.

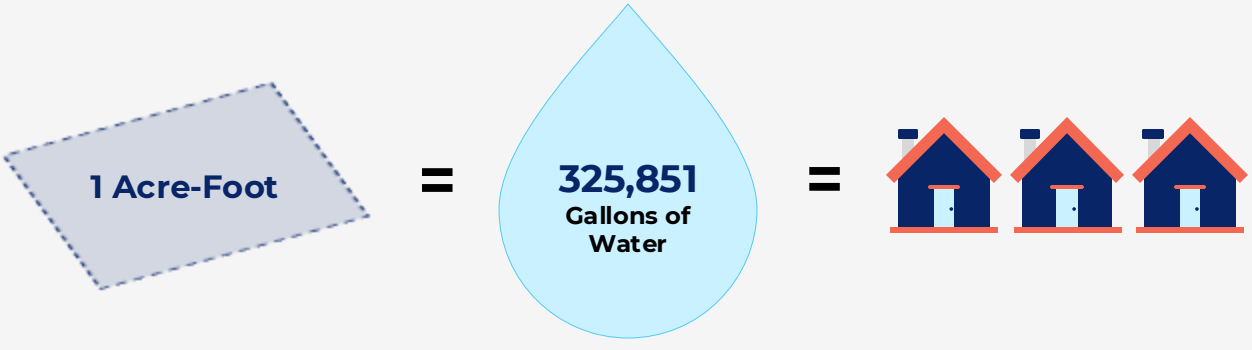
Texas faces a long-term water deficit

Texas' projected population and economic growth translate into increasing water demands. A growing population, due to in-state migration and growing families, will require more water. Between August 2014 and July 2024, a monthly average of 17,058 new private housing building permits were issued in Texas, totaling over 2 million permits during this time period according to data from the St. Louis Federal Reserve Bank.[4] These new subdivisions and housing units have all required water – both water supplies and infrastructure for delivery. As many water policymakers and practitioners have observed, "people are moving to Texas, but they're not bringing water with them."

Simply put, a growing state will demand more water. The 2022 State Water Plan prepared by the Texas Water Development Board (TWDB) forecasts that 51.5 million people will call Texas "home" by 2070. This represents a 73.4% increase from the 29.7 million people currently living in this state.[5]

Water demands will increase with this growing population. The 2022 State Water Plan forecasts that between 2020 and 2070, Texas' collective thirst will increase from 17.7 million acre-feet per year to 19.2 million acre-feet per year. This represents a 9% increase in water demands over the next half century.[6]

What is an acre-foot of water?



An acre-foot is the common metric used for water resource management

Enough to fill 1 acre of land (approximately the size of a football field with 1 foot of water)

1 acre-foot typically serves 2 to 3 Texas households per year

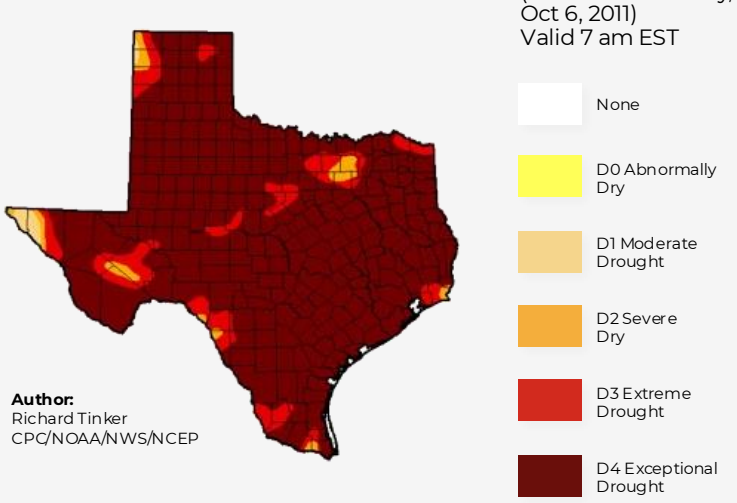
[4] U.S. Census Bureau, New Private Housing Units Authorized by Building Permits for Texas [TXBPPRIV], retrieved from FRED, Federal Reserve Bank of St. Louis, September 14, 2024.
[5] Texas Water Development Board, 2022 State Water Plan, page 48.
[6] Texas Water Development Board, 2022 State Water Plan, page 53.

Similarly, an economic expansion, attributable to the growth of in-state industries, industrial nearshoring and domestic relocation will increase – and in some cases, accelerate – water demands. Contemporary growth of certain water-intensive industries, particularly the semiconductor, data center, and refining industries, point to growing demands for water infrastructure. For example, recent announcements by Samsung and Texas Instruments for the expansion of semiconductor manufacturing activities in Texas coincided with public announcements regarding water supplies and infrastructure. In the meantime, the onset of data center development in Texas, which can consume hundreds of thousands – and sometimes millions – of gallons of water per day, will accelerate water demands.[7] Lastly, the growth in refining capacity, with six out of the seven newest refineries operating in the United States over the past decade located in Texas, equates with growing industrial demand for water.[8]

Texas' Droughts

The drought of record used for state water planning purposes occurred between 1950 and 1957. This prolonged drought had a severe impact on the state's agricultural economy, and prompted the beginning of state water planning and a subsequent boom in reservoir construction. The 1950s drought was not the worst Texas has endured, however. Paleoclimatic records indicate that Texas endured droughts that were longer, and more severe during the mid-19th, early 18th, and late 16th centuries. More recently, the worst one-year drought of record occurred in 2011. At its zenith in October 2011, 97% of the state was in the extreme drought category. Data from the Office of the State Climatologist at Texas A&M University suggests that future droughts may be more severe due to hotter temperatures and greater rainfall variability.

> **"Texas is the land perennial drought. broken by the occasional devastating flood.**
>
> - National Weather Service Meteorologist, 1927



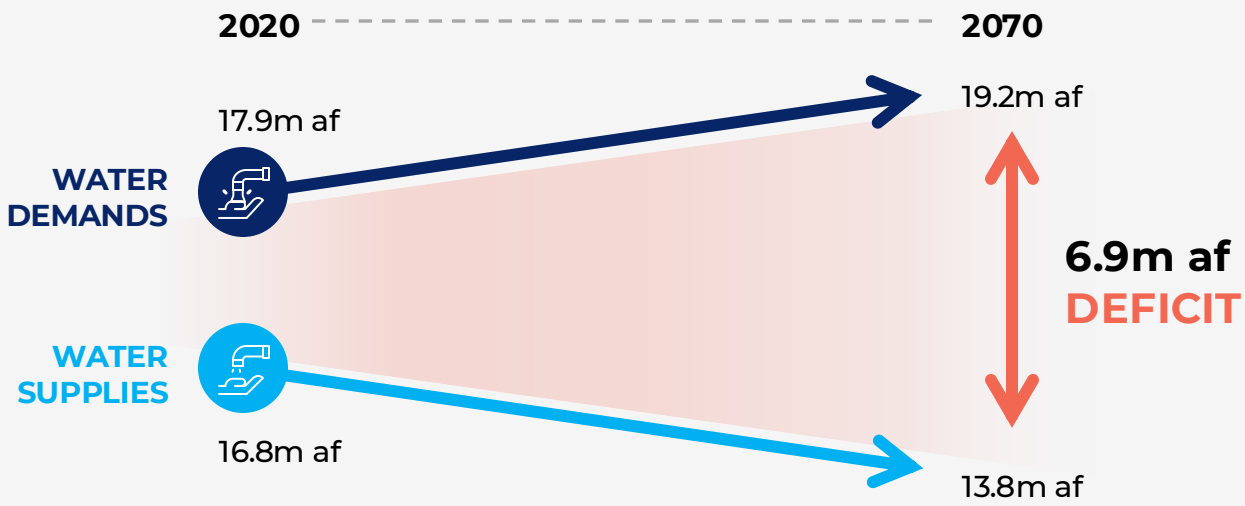
Sources: Cleveland. Votteler. et. al. "Extended Chronology of Drought in South Central, Southeastern, and West Texas." Texas Water Journal, Volume 2, No. 1, 2011. Office of the State Climatologist. Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, 2024.

[7] Rasheed Ahmad, "Engineers often need a lot of water to keep data centers cool." Civil Engineering, March 4, 2024
[8] US Energy Information Administration, "When was the last refinery built in the United States?," updated June 18, 2024

While population and economic growth will contribute to increased water demands, existing water resources are expected to diminish during a repeat of the drought of record. The inset, *Texas' Droughts*, describes Texas' drought of record and history of drought. According to the 2022 State Water Plan, annual existing water supplies during a repeat of the drought of record will decline from 16.8 million acre-feet in 2020 to 13.8 million acre-feet in 2070.[9] These declines are attributable to the sedimentation of rivers, lakes, and reservoirs and the depletion of groundwater resources. Other drought-related factors that could accelerate declines in water availability, including diminished inflows into lakes or reservoirs, or higher rates of evaporation due to hotter temperatures, are not included in the State Water Plan's projections.

Increasing water demands coupled with decreasing available water supplies creates the potential for a long-term water supply deficit if Texas fails to develop needed water supplies before it is affected by a repeat of a drought of record. The State Water Plan projects that this water supply deficit could reach 4.7 million acre-feet by the 2030s, and nearly 6.9 million acre-feet by the 2070s.[10] Texas' cities will see the greatest increase in water needs (i.e. water supplies needed for a drought of record). Between 2020 and 2070, municipal water needs will increase from 215,000 acre-feet in 2020 to 3,144,000 acre-feet in 2070.[11] If additional municipal water supplies and management strategies are not implemented, then at least 13.3 million Texans will have less than half of the municipal water supplies that they require in 2070.[12] Other water users that will face substantial water needs by 2070 include agricultural irrigation (3,046,000 acre-feet), manufacturing (301,000 acre-feet) and steam-electric generation (203,000 acre-feet).

Texas' Water Supply Deficit



Source: 2022 Texas State Water Plan

[9] Texas Water Development Board, 2022 State Water Plan, page 77.
[10] Texas Water Development Board, 2022 State Water Plan, page 86.
[11] Texas Water Development Board, 2022 State Water Plan, page 85.
[12] Texas Water Development Board, 2022 State Water Plan, page 86.

Aging, deteriorating water and wastewater infrastructure threatens water reliability

Many of Texas' water and wastewater systems continue to operate past their designed life. Their antiquity, combined with deferred maintenance and exposure to extreme weather conditions, contributes to the ongoing deterioration of these water systems. Over the past few years, these problems caused prolonged boil water notices in Laredo, broken water mains in Odessa, and the complete failure of the City of Zavalla's water system just to name a few examples. In 2021, Winter Storm Uri forced the problems with aging, deteriorating water systems into stark relief. Widespread power outages prompted over 2,300 boil water notices across the state, affecting over half of the state's population.[13] Scholars believe this was the largest boil water notice event in American history.[14] Approximately 49% of Texans endured without running water for more than two days.[15] While the loss of power was oftentimes the leading cause of outages, aging, brittle systems often broke or burst under the freezing conditions, contributing to widespread failures.

Several data points underscore the magnitude of Texas' aging, deteriorating water and wastewater infrastructure problems. A recent report card issued by the American Society of Engineers (ASCE) rates Texas' drinking water infrastructure with a C-.[16] While ASCE rightfully credits TWDB's water planning and financing efforts for addressing drinking water supply needs, the report points to an increase in boil water advisories between 2008 and 2015 as a potential indicator of aging infrastructure. The report also notes that increasing rates of water loss, especially within small systems, are indicative of low operational maintenance. Further, state drinking water systems' susceptibility to extreme weather events, including droughts and hurricanes, remains an ongoing liability.

Texas' wastewater systems, which collect, treat, and discharge sewage, receive the near-failing grade of D.[17] ASCE's assessment here reflects the absence of resilience to extreme weather events and a decline in systems' condition due to their age. In addition, the documented increase in sanitary sewer overflows between 2016 and 2019, combined with an increased subscription for TWDB financial assistance, points to systems in poor condition.

Texas' Water Infrastructure Grades

C-	Water Infrastructure
D	Wastewater Infrastructure

Source: American Society of Civil Engineers

[13] Yael Glazer, et. al., "Winter Storm Uri: A Test of Texas' Water Infrastructure and Water Resource Resilience to Extreme Winter Weather Events," Journal of Extreme Events, Volume 08, Issue 04, December 2021, page 6.
[14] Glazer, page 6..
[15] Glazer, page 6.
[16] American Society of Civil Engineers (ASCE), 2021 Report Card for America's Infrastructure, Texas 2021 Report, 2021.
[17] American Society of Civil Engineers (ASCE), 2021 Report Card for America's Infrastructure, Texas 2021 Report, 2021.

Boil water notices and high rates of water loss are common symptoms attributable to deteriorating water systems. Between 2019 and 2023 an average of 2,883 boil water notices were issued each year according to Texas Commission of Environmental Quality data. The majority of these boil water notices were due to low distribution pressure frequently attributable to line breaks or water outages. The increased frequency of these events affects a significant portion of Texans. According to a Texas Lyceum poll in 2024, one out of every three Texans indicated that they have received a boil water notice or notification of unsafe tap water over the past year.[18]

In the meantime, Texas' water systems lose substantial quantities of water. A study released by the Texas Living Waters Project and the National Wildlife Federation revealed that Texas water utilities leak at least 572,000 acre-feet – the equivalent of 186 billion gallons – of water per year.[19] The report observes that this volume of water equates with the combined one-year water needs for the cities of Austin, Fort Worth, El Paso, Laredo, and Lubbock. In fact, leaking pipes waste enough water each year to fill a major state reservoir.

Recent subscription rates for the clean and drinking water state revolving funds (SRFs) serve as another indicator of Texas' growing problem with aging, deteriorating water and wastewater infrastructure. Both funds are administered by TWDB, which prioritizes the allocation of each fund towards drinking and clean water projects that ensure compliance with the US Safe Drinking Water and US Clean Water Act. Many entities apply for financial assistance from the state revolving funds in order to replace aging, deteriorating systems. For example, 94 out of the 192 project applications received for the SFY 2025 Clean Water State Revolving Fund Intended Use Plan cited a need for replacing "old", "aging", "failing", "deteriorating", "dilapidated", or "leaking" systems or those near the "end of their useful life."[20] Similarly, 75 out of the 298 applications for the SFY 2025 Drinking Water State Revolving Fund included similar concerns.[21]

The subscription rates for both state SRFs are determined by comparing the total dollar amount of all applications received with the amount of funding for each fiscal year. For both the Clean and Drinking Water SRFs, the total dollar amount of the applications received significantly exceeds the amount of funding available. As indicated within ASCE's report card, this metric points to the magnitude of aging and deteriorating water and wastewater systems in Texas.

Boil Water Notices in Texas

2,883
Average

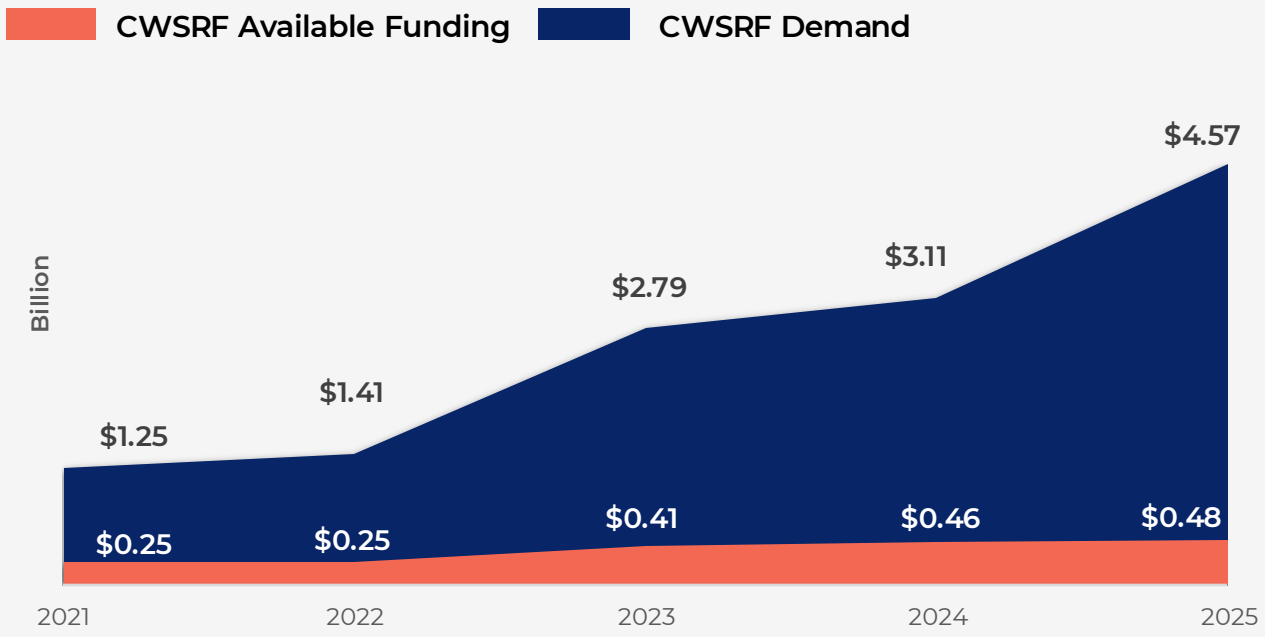
Boil water notices per year since 2019

Source: Texas Commission on Environmental Quality

[18] Texas Lyceum, 2024 Texas Lyceum Poll, 2024, page 16.
[19] Jennifer Walker, Alan Wyatt, Jonathan Seefeldt, Danielle Goshen, Meghan Bock, Ian Johnston, Maya Black, "Hidden Reservoirs: Addressing Water Loss in Texas" 2022, page 5.
[20] Texas Water Development Board, Clean Water State Revolving Fund Draft SFY 2025 Intended Use Plan, 2024.
[21] Texas Water Development Board, Drinking State Revolving Fund Draft SFY 2025 Intended Use Plan, 2024

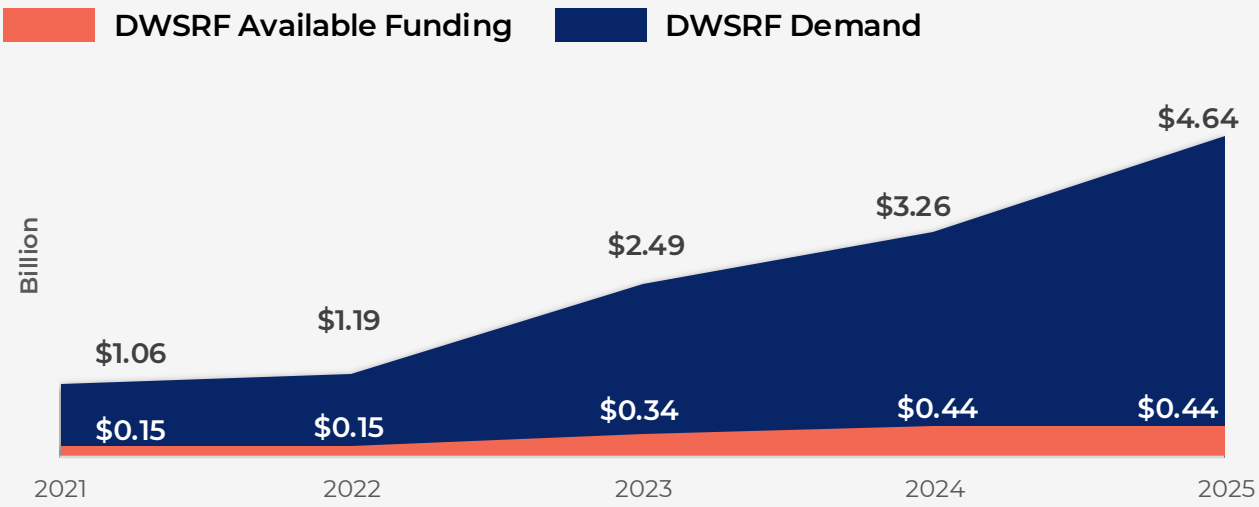
The Clean Water State Revolving Fund (CWSRF) provides financial assistance to assist wastewater operators in complying with the requirements of the US Clean Water Act. Over the past five years, Texas' CWSRF has received an average of $6.74 in applications for every available dollar. In the most recent funding cycle for state fiscal year (SFY) 2025, TWDB received CWSRF applications totaling nearly $4.6 billion for only $481.8 million in available funding. This amounts to a record-setting subscription rate of $9.48 for every available dollar. The chart, *CWSRF Demand vs. Available Funding (SFY 2021-2025)*, illustrates the widening gulf between Texas' wastewater utilities' demand for financial assistance and the funding amounts available for each fiscal year.

CWSRF Demand vs. Available Funding (SFY 2021-2025)



Texas' Drinking Water State Revolving Fund (DWSRF) assists utilities in achieving compliance with the requirements of the US Drinking Water Act. The DWSRF subscription rate is much higher than that for the CWSRF. For the past five years, TWDB received an average of $8.05 in application requests for every dollar available through the DWSRF. As indicated in the chart, *DWSRF Demand vs. Available Funding (SFY 2021-2025),* below, the annual demand for DWSRF funds significantly exceeds program capacity. In state fiscal year 2025, TWBD received over $4.6 billion in DWSRF applications for only $444.4 million in available funding, a record-setting subscription rate of $10.45 for every available dollar.

DWSRF Demand vs. Available Funding (SFY 2021-2040)



While the DWSRF and CWSRF subscription rates are indicative of a growing need to replace aging, deteriorating water and wastewater systems, they also highlight the substantial funding gap that exists between the state's financial assistance capacity and the needs of local utilities. The extent of this funding gap will be discussed in more detail in Chapter 3.

The final data point highlighting the magnitude of Texas' aging infrastructure problem is that many utilities are acutely aware of this problem. According to a 2024 survey of 245 water utilities released by the Texas Water Infrastructure Network and Collaborative Water Resources LLC, at least 55% cited aging infrastructure as a primary investment driver.[22] Nearly 50% of utilities indicated that at least 25% or more of their water mains were in need of replacement or repair.

Texas' long-term water infrastructure liability

Combined, Texas' long-term water infrastructure challenges will threaten future economic growth and development. The water supply deficit projected in the 2022 State Water Plan portends significant economic consequences in the absence of water needed by homes, businesses, and industry. Similarly, failing water and wastewater systems will continue to exact a toll on economic development and community vitality. This toll will become more severe as more systems continue to operate past their useful life. The next chapter explores the potential economic cost to Texas should the state fail to address these long-term water infrastructure challenges.

[22] Texas Water Infrastructure Network & Collaborative Water Resources LLC, Texas Water Capital Needs Survey (2024), page 9.

CHAPTER 2

Inadequate Water Infrastructure Threatens Economic Growth

Insufficient and unreliable water infrastructure invites the consequences of lost jobs, diminished income, and shrinking economic activity. This century alone includes several instructive examples of the economic harms attributable to the lack of reliable infrastructure. Between 1996 and 2012 Australia endured an extended drought known as the "Big Dry."[23] This prolonged drought shrank Australia's GDP (which is smaller than Texas') by 1.6%, incurred $15.7 billion ($10.7 billion US) in state and federal disaster assistance and resilience spending, and spurred billions in state spending on water supply projects including seawater desalination plants.[24] In 2018 the city of Cape Town, South Africa came perilously close to "Day Zero" – when it would run out of water – at a cost of 3.4% of the region's GDP.[25] Closer to Texas, in 2022, economic activity in Monterrey, Mexico, ground to a halt as the city ran out of water.[26]

The economic consequences of inadequate water infrastructure are also felt in the United States. Arizona limited new development around the City of Phoenix due to water availability limitations. In Texas, the cities of Conroe, Magnolia and Dripping Springs have also approved growth moratoriums owing to water supply and infrastructure concerns. In 2022, a failing water system in Jackson, Mississippi garnered national headlines as local businesses and residents struggled to find safe drinking water.[27] And in early 2024, a major employer in Texas' Rio Grande Valley, the Santa Rosa sugar mill, shuttered because of the lack of water in the Rio Grande. This closure was estimated to cost the local economy $100 million.[28] Later that year, South Texas citrus growers announced that diminishing water supplies were endangering both current production and the future viability of existing orchards.[29]

Left unaddressed, Texas' water infrastructure challenges will generate significant headwinds to the state's economy and growth prospects. As happened in Australia and Cape Town, a long, severe drought will inflict billions in economic losses if the state does not expand its water supply portfolio. At the same time, aging, deteriorating water and wastewater systems present growing liabilities to economic growth and activity that, if left unchecked, will bleed economic activity.

[23] Australian Institute for Disaster Resilience, "Environment - The Big Dry," (accessed Thursday, August 28, 2024.)
[24] David Fleming-Munoz, Stuart Whitten, Graham Bonnett, "The economics of drought: A review of impacts and costs," The Australian Journal of Agricultural and Resource Economics, June 28, 2023.
[25] Fleming-Munoz et. al., "The economics of drought: A review of impacts and costs," The Australian Journal of Agricultural and Resource Economics, June 28, 2023.
[26] Associated Press, "Deepening drought in Mexico's north a threat to jobs, tourism," NBC News, July 18, 2022.
[27] Ali Dinaldson, "Jackson, Mississippi's Water Crisis Is Pushing Local Businesses to the Brink," Inc., September 2, 2022.
[28] Fernando Del Valle, "Sugar mill closing amid water crisis; $100 million impact expected," MyRGV.com, February 22, 2024.
[29] Texas Citrus Mutual, "Texas Citrus Mutual Addresses Critical Water Issues in South Texas and Mexico's Water Debt," August 20, 2024.

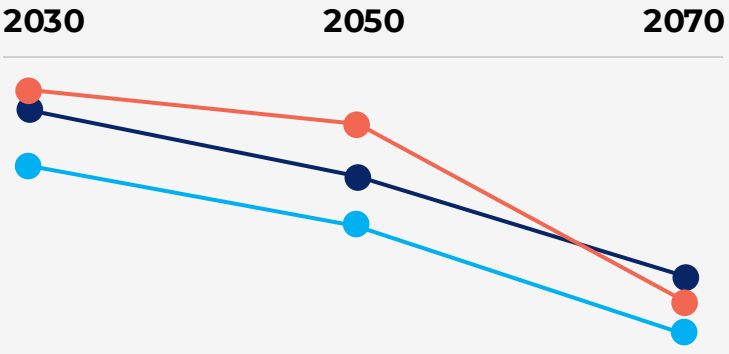
Failing to develop water supplies jeopardizes Texas' economy during drought

Texas' economy has suffered from the wrath of drought. The 1950s drought, also known as the Drought of Record, inflicted substantive damage on the state's agricultural sector, precipitating a migration from rural areas towards Texas' cities. In 2011, Texas endured its worst one-year drought of record, causing between $12 and $17 billion in damages to the state's agricultural sector.[30]

The 2022 State Water Plan provides insightful data on the economic consequences for Texas if the state fails to expand its water supply portfolio and is afflicted by another long, severe drought like that of the 1950s. The projected GDP loss values in the 2022 State Water Plan are in 2018 dollars. This analysis adjusts those values to 2024 dollars. Accordingly, by the 2030s, Texas could endure the loss of 785,000 jobs and $160 billion in GDP in one year from not having enough water for a prolonged drought period.[31] Towards the end of the State Water Plan's horizon, in the 2070s at least 1.4 million jobs could be lost along with $192 billion in GDP during a one year repeat of the drought of record. These economic consequences will precipitate migration out of Texas on the order of 144,000 leaving the state in the 2030s and nearly a quarter of a million by the 2070s.

2022 State Water Plan Economic Impact Data

(Inflation adjusted)



	2030	2050	2070
LEAVING TEXAS	144,000	187,000	252,000
JOBS LOST	785,000	1 Million	1.4 Million
GDP LOSS	$160 Billion	$165 Billion	$192 Billion

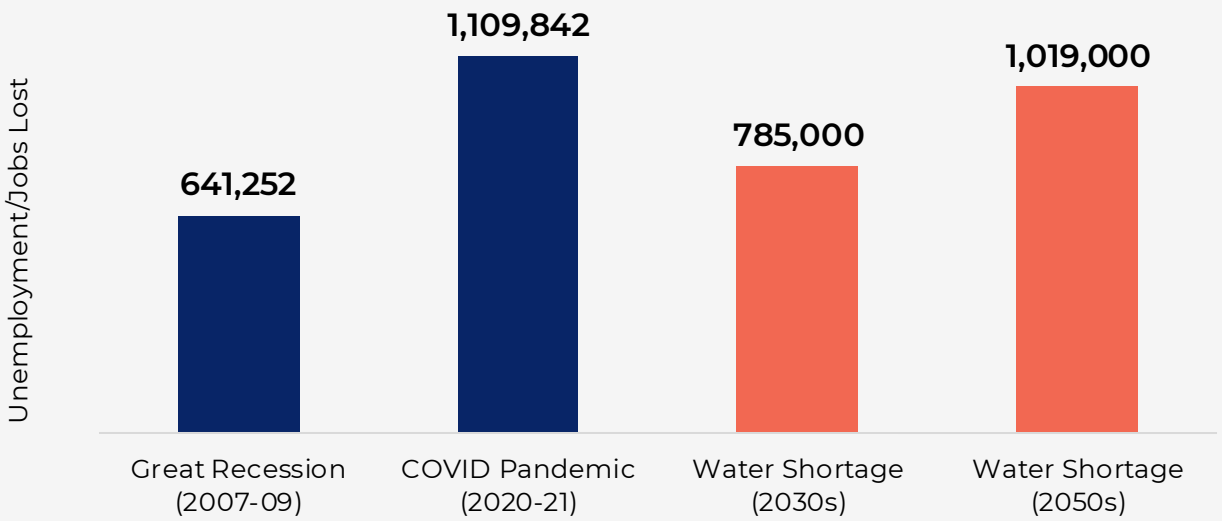
Source: 2022 Texas State Water Plan

[30] Gabriel Collins, Prospective Costs and Consequences of Insufficient Water Infrastructure Investment in Texas, 2024, [manuscript submitted for publication].
[31] Texas Water Development Board, 2022 State Water Plan, page 90.

For comparison, these economic shocks described in the State Water Plan exceed, and by some metrics equal, the magnitude of those endured in Texas during the Great Recession and the COVID-19 pandemic. During the Great Recession of the late 2000s, Texas' monthly unemployment averaged near 650,000 between December 2007 and June 2009 according to US Bureau of Labor Statistics data.[32] Texas' GDP declined by nearly $74 billion (2024 dollars) between 2008 and 2009 before recovering to slightly above 2008 levels in 2010.[33] Throughout the COVID-19 pandemic between March 2020 and April 2021 average monthly unemployment in Texas totaled just over 1.1 million, reaching a record high of 1.7 million in April 2020.[34] Between the pre-pandemic year 2019 and 2020, state GDP declined by $62.7 billion (2024 dollars) before rebounding in 2021.[35]

The chart, *Great Recession, COVID Pandemic, and Future Water Shortage Unemployment,* below, compares the average monthly unemployment rates in Texas during the Great Recession and the COVID Pandemic with the projected job losses from not having enough water supplies during a repeat of a drought of record in the 2030s and 2050s. The job losses attributable to water shortages are those reported in the State Water Plan. Although Texas' economy and labor force will likely be larger in the 2030s and 2050s relative to the Great Recession and Pandemic eras, the number of job losses due to water shortages are comparable to those observed during those times.

Great Recession, COVID Pandemic, & Future Water Shortage Unemployment



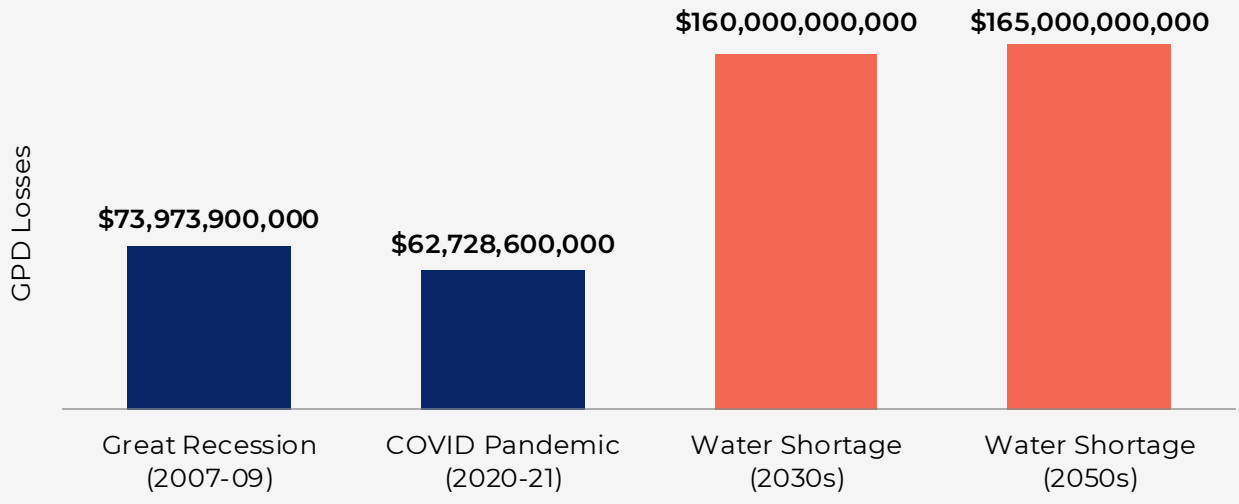
Sources: US Bureau of Labor Statistics, 2022 State Water Plan

[32]U.S. Bureau of Labor Statistics, "Texas Labor Force Data, Employment," (accessed Wednesday, October 9, 2024).
[33]U.S. Bureau of Economic Analysis, "SAGDP1 State annual gross domestic product (GDP) summary" (accessed Wednesday, October 9, 2024).
[34]U.S. Bureau of Labor Statistics, "Texas Labor Force Data, Employment," (accessed Wednesday, October 9, 2024).
[35]U.S. Bureau of Economic Analysis, "SASUMMARY State annual summary statistics: personal income, GDP, consumer spending, price indexes, and employment" (accessed Wednesday, October 9, 2024).

More alarmingly, the aggregate state GDP losses from not having enough water supplies to meet demands during future drought will exceed those endured during the Great Recession and COVID Pandemic. This comparison is depicted within the chart, *Great Recession, COVID Pandemic, & Water Shortage GDP Losses,* below. According to the State Water Plan's data, adjusted for inflation, water shortages during a repeat of a drought of record would inflict over $150 billion in GDP losses in the 2030s and 2050s. This exceeds the GDP declines observed in Texas during the Great Recession and COVID Pandemic.

The 2022 State Water Plan notes that these cost estimates are "snapshots of a one-year repeat of the drought of record" however.[36] This means that a prolonged, multi-year drought event, like that of the 1950s, would inflict greater economic damages in aggregate if Texas does not develop needed water supply projects. These GDP losses over the course of a multi-year drought – like that of the 1950s – would be substantially higher than those observed during the Great Recession and COVID Pandemic.

Great Recession, COVID Pandemic, & Water Shortage GDP Loss



Sources: US Bureau of Economic Analysis, 2022 State Water Plan

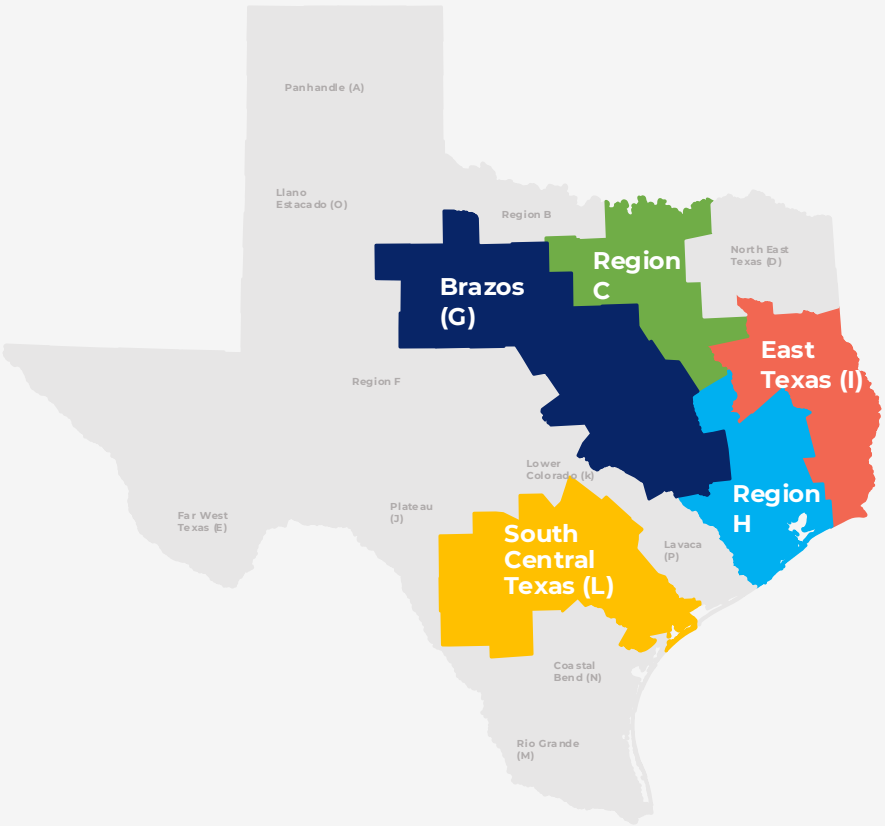
Regional Industry Economic Impacts

Different industries within various planning regions of the state will be affected by the lack of water supplies during a long, severe drought. This analysis shows how key industries across different regions of the state would be affected under these circumstances. While some of these economic sector impacts will be felt within the Texas Triangle between DFW, Houston, and Austin-San Antonio, key industries in regions outside of this area will also be affected.

[36] Texas Water Development Board, 2022 State Water Plan, page 90.

The top five regions for manufacturing in Texas include the Dallas-Fort Worth Metroplex, greater Houston area, East Texas (including Beaumont, Tyler, and Lufkin), Central Texas (including College Station, Temple, and Waco), and South Central Texas (including San Antonio and Victoria). These regions account for 82% of state manufacturing GDP and 77% of manufacturing jobs. According to an analysis by the Baker Institute for Public Policy at Rice University, within 20 years these five regions will endure nearly $20.8 billion in manufacturing GDP and more than 116,000 jobs lost due to water shortages during a repeat of a drought of record.[37]

Top 5 Manufacturing Regions Affected by Potential Water Shortage During a Drought of Record

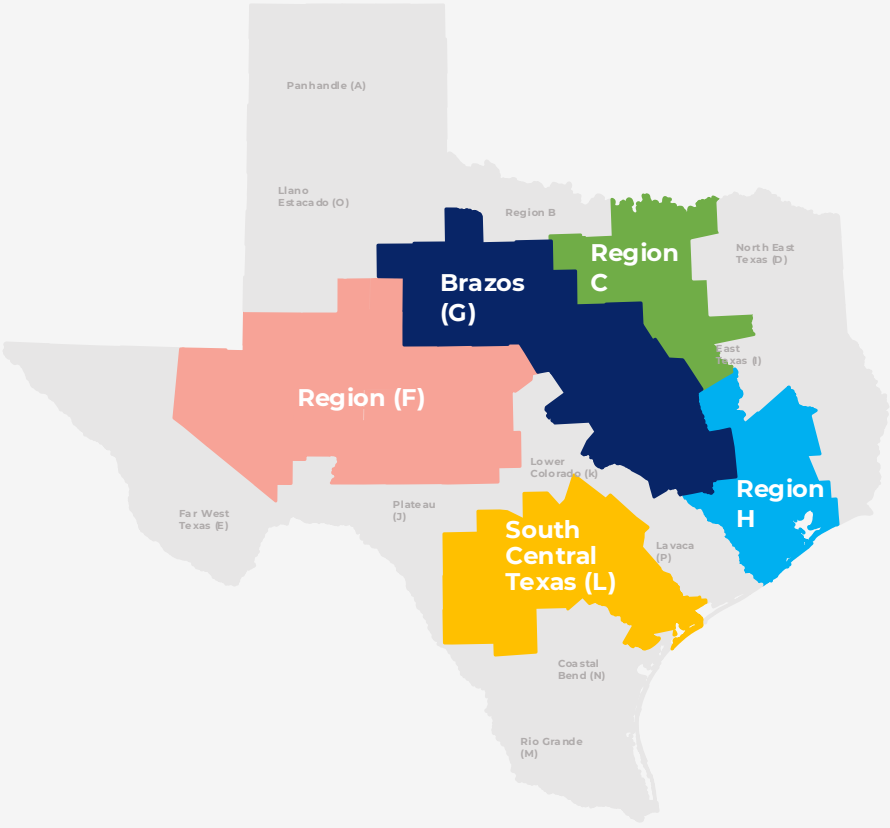


Sources: 2022 State Water Plan, Economic Impact of Severe Draught by Dr. Joyce Beebe(2022)

[37] Dr. Joyce Beebe, "Economic Impact of Severe Drought," 2022, pages 16-17. (This report cited $16.6 billion in manufacturing sector GDP losses by 2040 in 2018 dollar values. This analysis updates that GDP estimate to account for recent inflation.)

Texas' energy sector, which includes oil and natural gas extraction and electricity generation (steam-electric power), serves as a cornerstone to the state's economy. As illustrated by the map, Top 5 Energy Regions Affected by Water Shortage, Texas' leading energy-related regions include DFW, Houston, Central Texas, South Central Texas, and the Permian Basin (including Midland and Odessa). Combined, these five regions contribute over 80% of Texas' energy-related GDP, and account for 75% of energy-related jobs. By 2040, these five regions could lose $52.9 billion in energy sector GDP and nearly 200,000 jobs during a severe drought event.[38]

Top 5 Energy Regions Affected by Potential Water Shortage During a Drought of Record



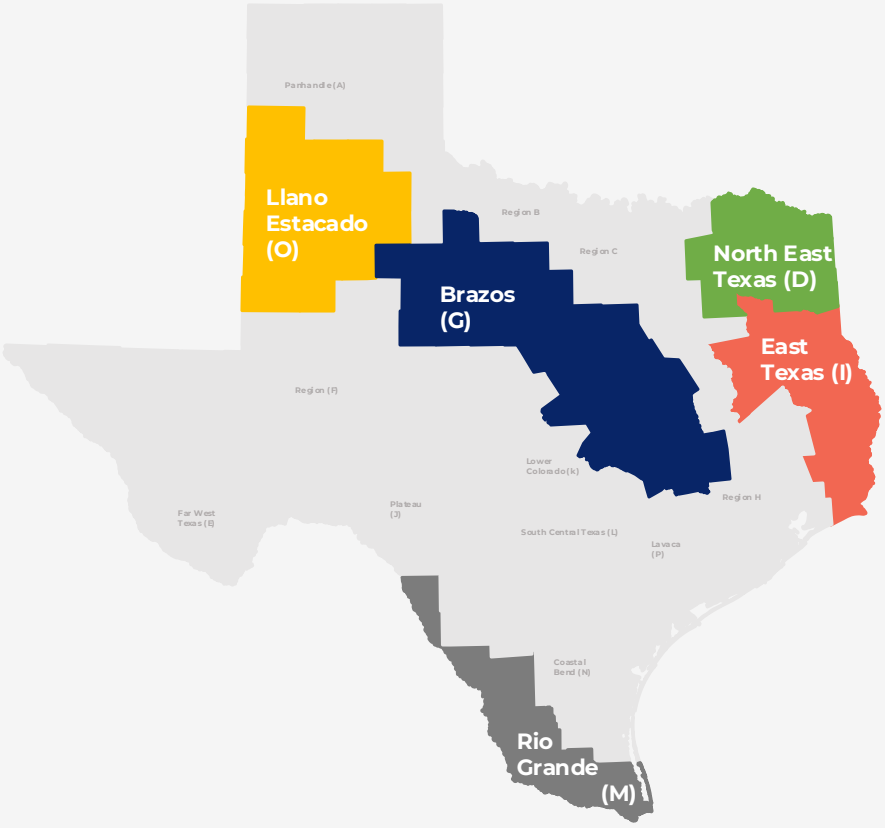
Sources: 2022 State Water Plan, Economic Impact of Severe Draught by Dr. Joyce Beebe(2022)

[38] Beebe, "Economic Impact of Severe Drought," 2022, page 19. (This report cited $42.2 billion in energy sector GDP losses by 2040 in 2018 dollar values. This analysis updates that GDP estimate to account for recent inflation.)

Although not as capital intensive as the manufacturing and energy sectors, Texas' agricultural sector will be profoundly affected by water shortages due to drought. This sector is also likely the first to endure economic losses from the onset of severe, prolonged drought conditions.

Moreover, and unlike the manufacturing and energy sectors, agricultural activity is more widely distributed across the state. Texas' top five agricultural regions, as measured by agricultural GDP and related jobs, include Northeast and East Texas, Central Texas, the Rio Grande Valley, and the Llano Estacado in West Texas. Combined, these regions account for 54% of state agricultural GDP and 45% of jobs. According to an analysis by the Baker Institute at Rice University, by 2040 a severe drought would cost these five regions over $4.5 billion in agricultural GDP and 63,000 jobs.[39]

Top 5 Agricultural Regions Affected by Potential Water Shortage During a Drought of Record



Sources: 2022 State Water Plan, Economic Impact of Severe Draught by Dr. Joyce Beebe(2022)

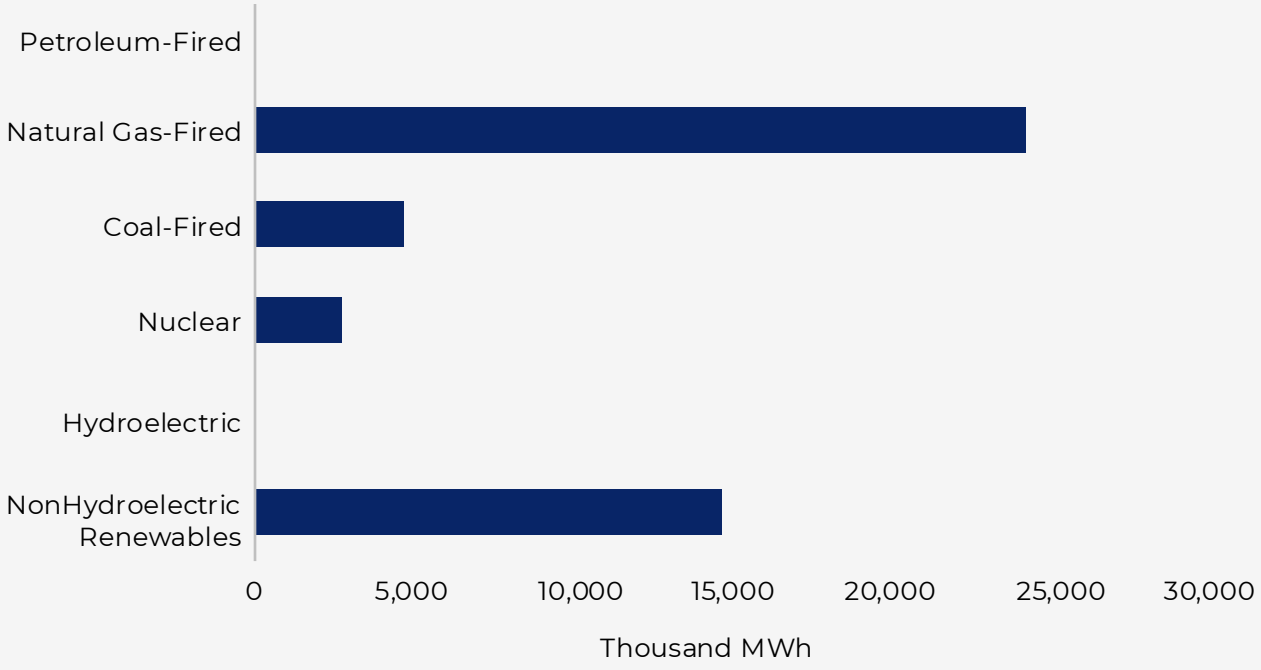
[39] Beebe, "Economic Impact of Severe Drought," 2022, page 21. (This report cited $3.6 billion in agricultural sector GDP losses by 2040 in 2018 dollar values. This analysis updates that GDP estimate to account for recent inflation.)

Impact on the Texas Electric Grid

Different industries within various planning regions of the state will be affected by the lack of water supplies during a long, severe drought. This analysis shows how key industries across different regions of the state would be affected under these circumstances. While some of these economic sector impacts will be felt within the Texas Triangle between DFW, Houston, and Austin-San Antonio, key industries in regions outside of this area will also be affected.

In 2023, Texas' utility-scale electricity generation accounted for 12.9% of all US generation.[40] According to the US Energy Information Administration's analysis, Texas generated more electricity than any other state, and nearly twice the amount of its second-place competitor, Florida.[41] As depicted within the chart, *Texas Net Electricity Generation by Source*, a substantial portion of Texas' electric generation comes from dispatchable sources, including natural gas, nuclear, and coal-fired plants. These generation sources, which are capable of operating regardless of weather conditions (provided that they are weatherized), are essential to the continued reliability of the state's electric grid. Moreover, and as demonstrated within Texas 2036's Future of Texas Energy scenario models, even as renewable generation capacity increases within Texas, these dispatchable forms of electricity generation will be essential for the seamless provision of electric service.[42]

Texas Net Electricity Generation by Source, May. 2024

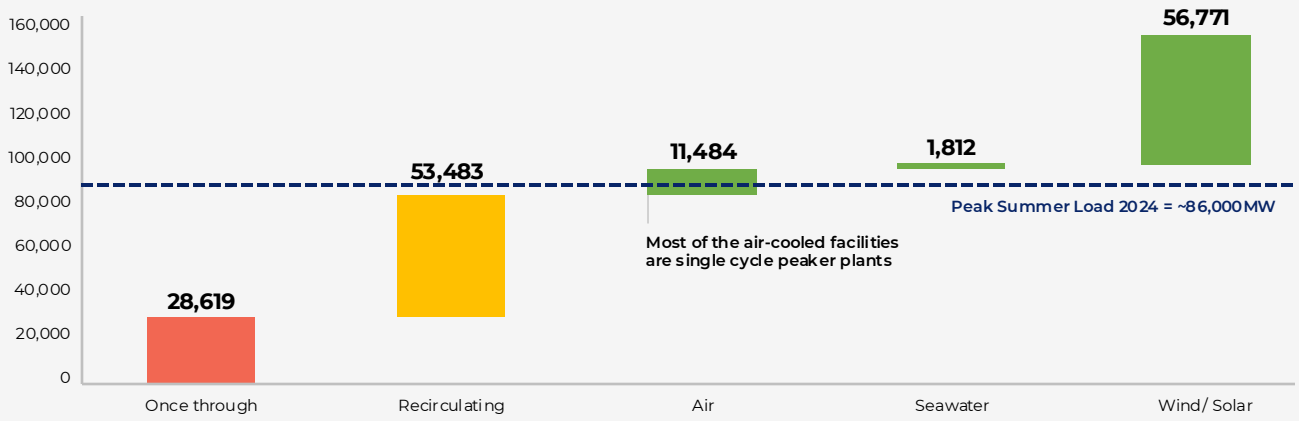


Source: Energy Information Administration, Electric Power Monthly

[40] US Energy Information Administration (USEIA), Electricity Data Browser.
[41] USEIA, Rankings: Total Net Electricity Generation, May 2024 (thousand MWh).
[42] Texas 2036, The Future of Texas Energy, Texas Energy and Economic Scenario Planner, 2024.

Dispatchable generation requires substantial water supplies and resources to operate. As depicted in the chart, *Texas Electricity Generation by Cooling Type*, over 80,000 MW of generation uses "once-through" or recirculating water for cooling and generation purposes. These "once-through" facilities collect surface water from rivers, lakes, or reservoirs for generation purposes and then discharge that water after it runs through their systems. Recirculating facilities collect water for continuous use within their generating systems that include heat exchangers and cooling towers. A substantial portion of the state's electric generation capacity relies on state water resources. More critically, this generation is essential for meeting peak summertime loads.

Texas Electricity Generation by Cooling Type



Source: Gabe Collins, Prospective Costs & Consequences of Insufficient Water Infrastructure Investment in Texas, 2024

Insufficient water infrastructure, specifically water supplies, will threaten the reliability of the state's electrical grid during prolonged drought conditions. In 2023 Texas witnessed one of its hottest summers on record, precipitating record-breaking electricity demands as homes and businesses increased air conditioning use. In the meantime, severe drought conditions spread throughout the state, including central and eastern portions of Texas.[43] That August, the Electric Reliability Council of Texas (ERCOT) reported more than 25% of the grid's dispatchable electricity generation was at risk of having insufficient water supplies over the subsequent 18 months to sustain operations.[44] Had these severe drought conditions persisted into 2024 as had happened during previous multi-year droughts, then a substantial portion of Texas' dispatchable generating capacity needed for reliable electricity service would have been at risk of interruption.

The interruption of dispatchable electricity generation due to the scarcity of reliable water supplies would inflict substantial damages on Texas' economy. A recent study that quantified the value of lost electricity load to medium and large commercial customers within the ERCOT region suggests that the cost of each unserved megawatt hour of electricity is approximately $35,000 for a one-hour outage, trailing down to $13,500 per megawatt-hour for a 16-hour outage.[45] At $13,500 per MWh, each 1,000 MW of generation capacity shortfall could trigger daily economic losses of more than $320 million. If recent history serves as an instructive guide, the electricity interruptions during Winter Storm Uri in February 2021, contributed to over $100 billion in losses for Texas.[46]

[43] U.S. Drought Monitor, Texas Drought Map, August 15, 2023.
[44] Electric Reliability Council of Texas (ERCOT), ERCOT Drought Risk Analysis: 2023, page 1. Gabriel Collins, Prospective Costs & Consequences of Insufficient Water Infrastructure Investments in Texas, 2024, [manuscript submitted for publication].
[45] Charles Gibbons, Sanem Sergici, "Value of Lost Load Study for the ERCOT Region," The Brattle Group, August 19, 2024, page 3.
[46] Garrett Golding, Anil Kumar and Karel Mertens, "Cost of Texas' 2021 deep freeze justifies weatherization" Federal Reserve Bank of Dallas, April 15, 2021.

Aging, deteriorating water and wastewater systems will inflict economic damages

Aging, deteriorating water and wastewater systems present distinct obstacles to economic growth and financial stability. Unreliable water service, whether caused by a broken water main or a failing pump, interrupts everyday civic and business activity. Restaurants and hotels close, manufacturers stop operations, and families search for bottled or hauled water to meet their needs. Over the past few years water system failures within several Texas cities, including Zavalla,[47] Odessa,[48] and Toyah,[49] to name a few, adversely affected communities' quality of life. Even boil water notices, which are sometimes symptomatic of failing systems, can inflict upheaval within an affected area. In November 2022, Houston issued a city-wide boil water notice, prompting area schools to close for several days and families to scramble for child-care options.[50] Lastly, improperly treated drinking water and wastewater present a threat to human health and safety. Contaminated drinking water can sicken entire communities, as happened in Milwaukee, Wisconsin when cryptosporidium contaminated the city's water system in 1993. Similarly, failing wastewater systems increase exposure to harmful parasites, viruses and bacteria.

Failing water systems will exact their economic toll over time. These costs come in the form of foreclosed or diminished business activity across multiple economic sectors, health care expenses and families' efforts and expenses towards obtaining safe water. While there is no Texas-specific study of the economic impacts attributable to aging, deteriorating water and wastewater systems, the Value of Water Campaign has released a series of reports in partnership with the American Society of Civil Engineers describing these costs at the national level. These reports found that failing water systems, left unaddressed, could contribute to a cumulative national GDP loss of $3.6 trillion dollars by year 2039.[51] This decline would precipitate the nationwide loss of 636,000 jobs per year. In addition to these macroeconomic impacts, American households will spend upwards of $5.3 billion annually by 2029, and over $17 billion per year in 2039, towards finding alternative water supplies and cleaning up after sewer overflows.[52] The Value of Water Campaign also estimates that between 2019 and 2039 US households will spend nearly $9.5 billion in cumulative health-care costs attributable to failing water and wastewater systems.[53]

US Economic Costs Attributable to Failing Water & Wastewater Systems

Cumulative GDP Loss (2019-2039)	**$3.6 Trillion**
Daily GDP Loss	**$30 Billion**
Annual Total Household Impact (2039)	**$17 Billion**
Cumulative Health Care Costs (2019-2039)	**$9.5 Trillion**

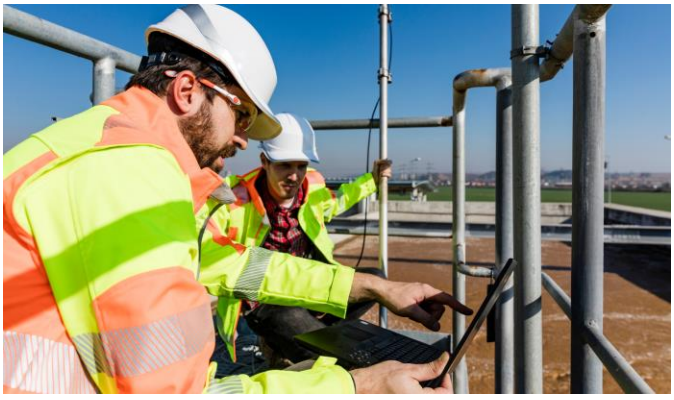
[47] Pooja Salhotra, "An East Texas town must boil its water on Thanksgiving as officials seek a solution to aging infrastructure," Texas Tribune, November 23, 2022.
[48] Carlos Nogueras Ramos, "After three citywide water outages, Odessa will invest $25 million to fix infrastructure," Texas Tribune, July 17, 2024.
[49] Mitch Borden, "Toyah residents struggle to access clean water as boil water notice stretches on for years," Marfa Public Radio, April 14, 2023.
[50] Hannah Dellinger, John Wayne Ferguson, "HISD cancels class again Tuesday due to boil water notice," Houston Chronicle, November 28, 2022.
[51] Value of Water Campaign, The Economic Benefits of Investing in Water Infrastructure: How Failure to Act Would Affect the US Economic Recovery, 2020, page 22. The original report, published in 2020, observed a GDP loss of $2.9 trillion in 2019 dollars. This analysis updates that estimate to account for recent inflation.
[52] Value of Water Campaign, 2022, page 24. Cost estimates updated to 2024 values.
[53] Value of Water Campaign, 2022, page 25. Cost estimates updated to 2024 values.

Analysis of the Value of Water Campaign's data reveals that Texas could endure substantial economic impacts attributable to aging, deteriorating drinking water and wastewater systems. Using the statistical basis that Texas accounted for an average of 8.83% of US GDP and 8.11% of US households over that past decade provides more granular insights into how much failing water infrastructure will cost Texas' economy and families.[54] Applying Texas' share of US GDP to the Value of Water Campaign's data suggests that between 2020 and 2039, water service interruptions due to decaying infrastructure could contribute to a cumulative state GDP loss of $317.9 billion.[55] Unreliable water and wastewater infrastructure will cost Texas households and families $430 million by 2029, and nearly $1.4 billion in 2039.[56] Lastly, water contamination attributable to failing drinking water and wastewater systems will cost Texas families, and also state and local governments, a total of at least $770 million by 2039.

The costs attributable to failing water and wastewater systems will escalate over time. Just as unreliable water infrastructure will trigger immediate problems for Texas' businesses and families as they cope with boil water notices or scrounge for bottled water, the persistence of these problems will accrue economic damages over the next 20 years that nearly equal the size of the current two-year state budget. These economic costs and impacts will escalate as Texas' water and wastewater systems continue their march towards – and in some cases past – the end of their useful life.

Texas' Economic Costs Attributable to Failing Water & Wastewater Systems

Cumulative GDP Loss (2019-2039)	**$317.9 Billion**
Annual Total Household Impact (2039)	**$1.4 Billion**
Cumulative Health Care Costs (2019-2039)	**$770 Million**



[54] These percentages were determined by analyzing US and Texas household and GDP data available through the U.S. Census Bureau and the U.S. Bureau of Economic Analysis.
[55] This value was determined by multiplying 8.83% (Texas' average share of US GDP between 2014 and 2023) by $3.6 trillion (the inflation-adjusted cumulative US GDP losses by 2039 reported by the Value of Water Campaign).
[56] These values were determined by multiplying 8.11% (Texas' average share of US households between 2013 and 2022) by $5.3 billion and $17 billion (the inflation-adjusted US household impacts for 2029 and 2039 reported by the Value of Water Campaign).

CHAPTER 3

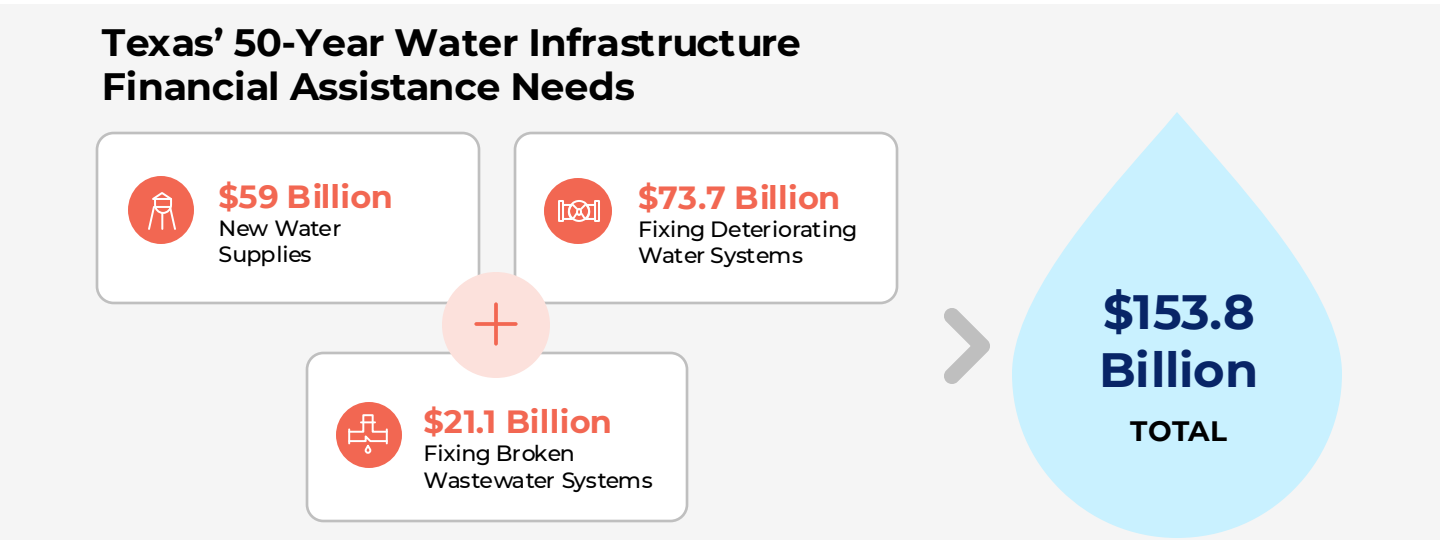
Texas Underfunds Water Infrastructure Needs

Texas will need to invest at least nearly $154 billion over the next 50 years in order to address its water infrastructure challenges. This figure reflects the inflation-adjusted cost estimates included in the 2022 State Water Plan and the US Environmental Protection Agency's (EPA) recent community needs assessments for drinking and wastewater infrastructure. Unfortunately, despite recent state and federal funding initiatives, the State of Texas remains behind the curve for keeping pace with needed water infrastructure investments. Texas 2036 estimates a long-term water infrastructure funding gap of at least $112 billion.

Texas' 50-year price tag for reliable water infrastructure: $153.8 billion

The 2022 State Water Plan recommends over 2,400 water supply projects needed to deliver reliable water supplies in the event of a repeat of the drought of record. These projects include new reservoirs, desalination plants, aquifer storage and recovery facilities, water reuse, conservation programs, and new groundwater wells, to name a few. The inflation-adjusted 50-year price tag for these projects equals $100 billion.[57] Part of this $100 billion will be paid by local water users through rates or fees. The remaining $59 billion in water supply project costs will require state financial assistance, however. These cost estimates are only for developing the new water supplies needed to answer Texas' anticipated water supply deficit during a drought of record. They do not include the cost attributable to the replacement of existing water and wastewater systems.

Data from the US EPA identifies the costs associated with addressing aging, deteriorating water and wastewater systems over the next 20 years. In 2023, the EPA released its 7th Drinking Water Infrastructure Survey and Needs Assessment.[58] This survey gauges the price tag for Drinking Water State Revolving Fund (DWSRF)-eligible projects, including the installation of new drinking water plants and the replacement or rehabilitation of existing systems. According to the 2023 assessment, and adjusting for inflation, Texas will have $73.7 billion in drinking water infrastructure needs between 2021 and 2040.[59]



Sources: 2022 Texas State Water Plan, US EPA. Cost estimates reflect 2024 values.

[57] The total capital costs for projects recommended in the 2022 State Water Plan equals $80 billion in 2018 dollars. (TWDB, 2022State Water Plan, page 133) Using an online inflation calculator, this $80 billion price tag equals $100 billion in 2024 dollars.

[58] US Environmental Protection Agency (USEPA), Drinking Water Infrastructure Needs Survey and Assessment, 7th Report to Congress, September 2023.

[59] EPA's original cost estimate for Texas equaled $61.3 billion in January 2021 dollars. The revised $73.7 billion estimate was calculated by using the US Bureau of Labor Statistics' Consumer Price Index Inflation Calculator to determine July 2024 values.

The EPA released a similar assessment for wastewater infrastructure in 2024.[60] This assessment identifies the capital investments needed for compliance with the US Clean Water Act between 2022 and 2041. Relevant projects include wastewater treatment plants, sewer systems, stormwater facilities, and nonpoint source controls. The EPA estimated that Texas's wastewater utilities will have $18.9 billion in wastewater infrastructure needs between 2022 and 2041. Adjusted for inflation, this figure equals $21.1 billion in 2024 dollars.[61]

The $153.8 billion cost estimate for Texas' long-term water infrastructure needs does not account for other factors that could make these costs higher over time. For example, the cost estimates in the State Water Plan do not account for future inflation. This means that the $100 billion in water supply projects costs and the $59 billion in state financial assistance needs could be higher if the United States endures inflationary periods similar to (or worse than) that between 2022 and 2024.

Further, the EPA's drinking water and wastewater community needs surveys are for project needs between now and 2040 and 2041. It is reasonable to assume that, as drinking water and wastewater systems continue to age and deteriorate, and are challenged to meet the requirements of the US Safe and Clean Water acts, that these costs will continue to escalate by 2070. For example, based on the observation that the EPA's cost estimates for the Drinking Water Community Needs assessments have increased by an average of 35.4% since the first assessment was released in 1997, the projected costs for a survey released in 2043 for project needs between 2041 and 2060 could equal $279.1 billion. [62] It should also be noted that the EPA's estimates are for compliance with existing federal water regulations. They do not account for aging, deteriorating utilities that are compliant with federal regulations but also lack the financial capacity to rehabilitate their systems.

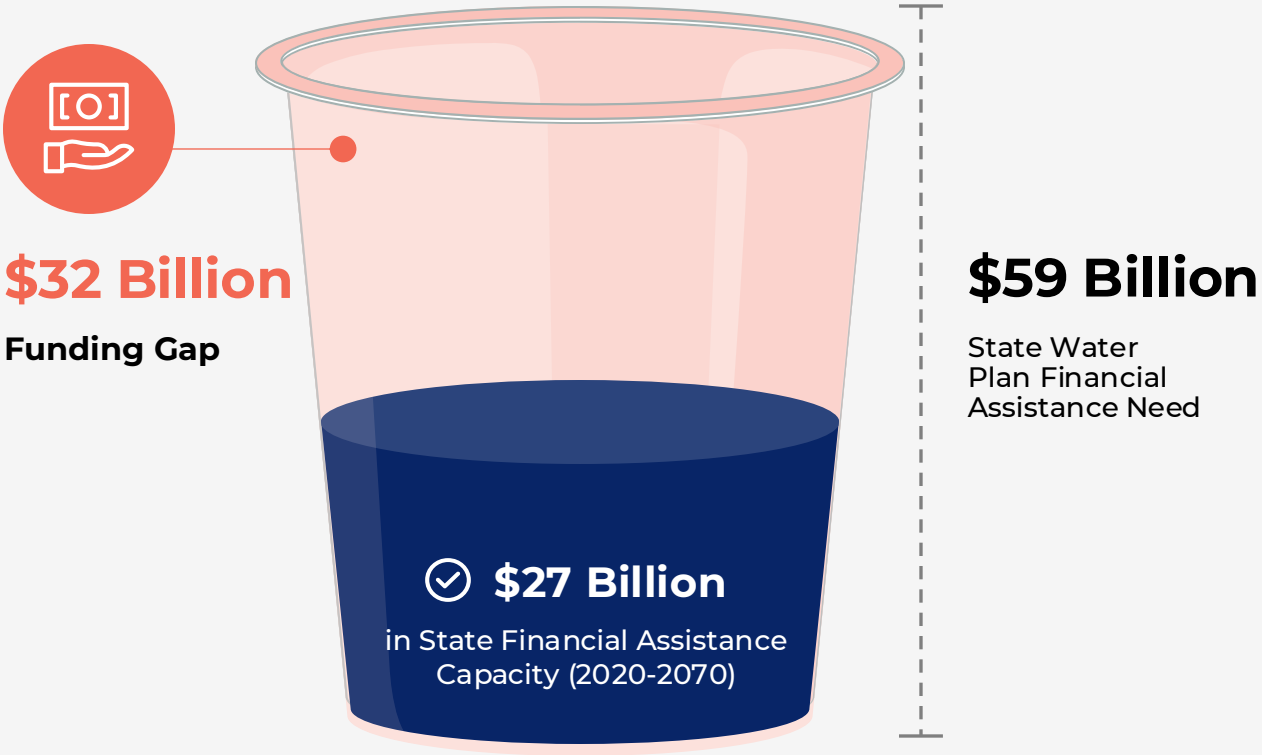
Lastly, the $153.8 billion cost estimate applies to only water infrastructure, including water supplies, and drinking and wastewater systems. This figure does not include the capital expenditures needed for flood control and mitigation projects. The 2024 State Flood Plan released by the Texas Water Development Board in August 2024 includes 4,609 flood risk reduction solutions with an estimated total implementation cost of more than $54.5 billion.[63]

[60] USEPA, 2022 Clean Watersheds Needs Survey, Report to Congress, April 2024.
[61] EPA's original cost estimate for Texas equaled $18.9 billion in January 2022 dollars. The updated, inflation-adjusted figure was calculated by using the US Bureau of Labor Statistics' CPI Inflation Calculator to determine July 2024 values.
[62] EPA's drinking water needs assessments have increased an average of 35.4% since they were first published in 1997. The non-inflation adjusted cost estimates for Texas' drinking water infrastructure needs within EPA's seven community needs assessments were $12.4 billion (1997 assessment), $13.1 billion (2001 assessment), $28.2 billion (2005 assessment), $26.1 billion (2009 assessment), $33.9 billion (2013 assessment), $45.2 billion (2018 assessment), and $61.3 billion (2023 assessment). The average rate of increase between these assessments equals 35.4%.
[63] Texas Water Development Board, 2024 State Flood Plan, 2024, page 2.

Texas' water infrastructure funding gap: $112 billion

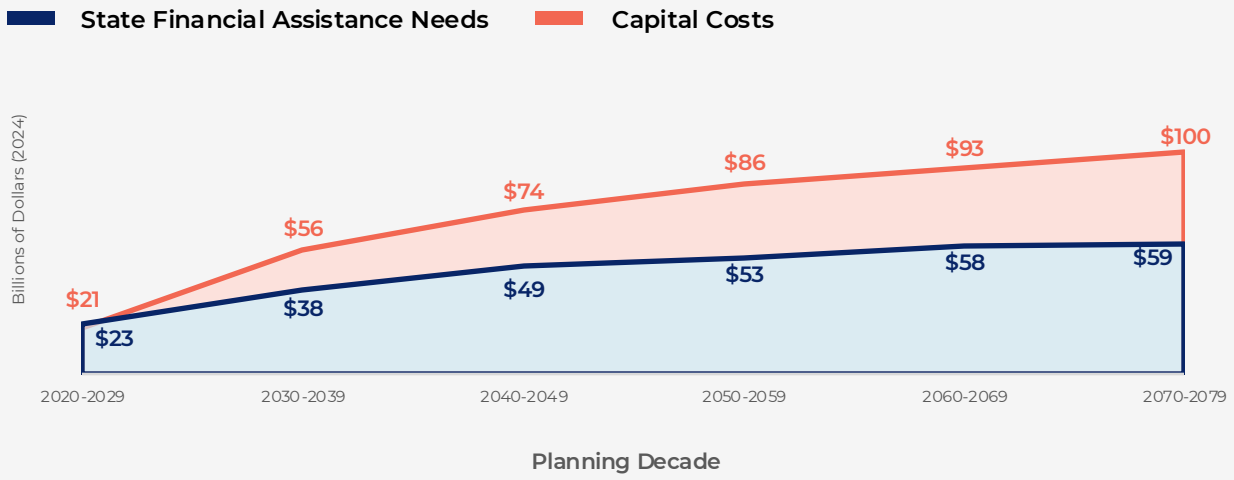
Despite the significant and escalating costs associated with Texas' water infrastructure needs, the state's financial assistance effort lags behind the estimated needs. Consequently, substantial funding gaps exist between the amount of financial assistance needed for water supply and drinking and wastewater projects and the amount of financial assistance that has been and is projected to be provided over the next decades.

State Water Plan Funding Gap: $32 Billion by 2079



The capital costs of recommended water supply projects and management strategies in the 2022 State Water Plan needed to prepare Texas for the next long, severe drought equals $80 billion. Of this $80 billion, $47 billion will require state financial assistance – in the form of state-originated low-interest loans or grants – over the next 50 years. The remaining $33 billion would be paid by local ratepayers. These figures were based on 2018 dollar values, however. A revised cost estimate that accounts for inflation since 2018 reveals that the State Water Plan's project costs are 25% higher than the figures provided in the original report. These updated cost estimates are depicted within the chart, *Inflation Adjusted 2022 State Water Plan Capital Costs & Financial Assistance Needs (2020-2079)*, below.

Inflation Adjusted 2022 State Water Plan Capital Costs & Financial Assistance Needs (2020-2079)



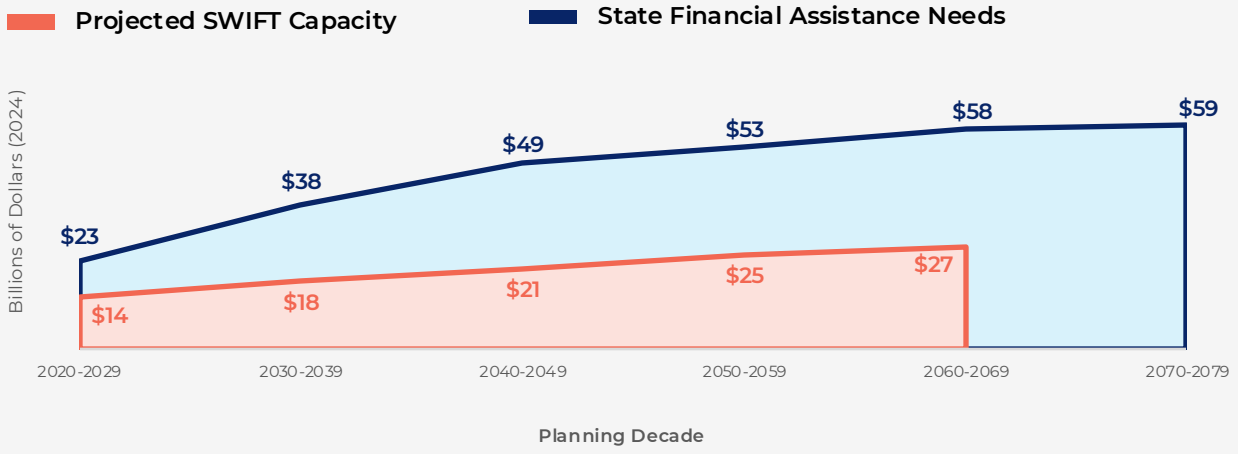
As depicted in the chart, the aggregate capital cost for water supply projects in the 2022 State Water Plan will total $100 billion by the 2070s. Over one half of these costs will require state financial assistance in the form of either below market interest rate loans or grants. By the 2030s at least $38 billion in state financial assistance will be required. The amount of state financial assistance effort required for recommended State Water Plan projects grows to $59 billion by the 2070s.

Despite TWDB's progress towards funding State Water Plan projects through the State Water Implementation Fund for Texas (SWIFT) and other agency programs, the State of Texas lags in the financial effort needed to fund the water supply projects needed over the next 50 years. The SWIFT was created in 2013 for the purpose of providing low-interest loans for water infrastructure projects in the State Water Plan. At the time of its creation, the SWIFT was designed and capitalized to finance $27 billion in State Water Plan projects over 50 years.[64] As of August 2024, the SWIFT has made nearly $14.5 billion in financial commitments, of which at least $13.7 billion reflects state financial assistance needs in the current State Water Plan.

[64] Texas Water Development Board, "State Water Implementation Fund for Texas (SWIFT)," accessed on August 20, 2024.

The SWIFT lacks the capacity to provide the $59 billion in state financial assistance needed over the next 50 years for State Water Plan projects. Given the SWIFT's historic funding commitments, the program's decade-old legislative directive to finance $27 billion in water projects over 50 years, and accelerating demands for state financial assistance for water supply projects, Texas faces a long-term funding gap of $32 billion for needed water supply projects. The chart, *State Financial Assistance Needs vs. Projected SWIFT Capacity (2020-2079)*, illustrates the magnitude of this funding gap. Between this decade and that of 2060, the last decade of the SWIFT's anticipated life cycle, state financial assistance needs are projected to increase at a rate of more than double the SWIFT's capacity. Further, given the SWIFT's 50-year operational horizon, it's hard to determine if the program will be capable of providing financial assistance after the 2060 decade.

State Financial Assistance Needs vs. Projected SWIFT Capacity (2020-2079)



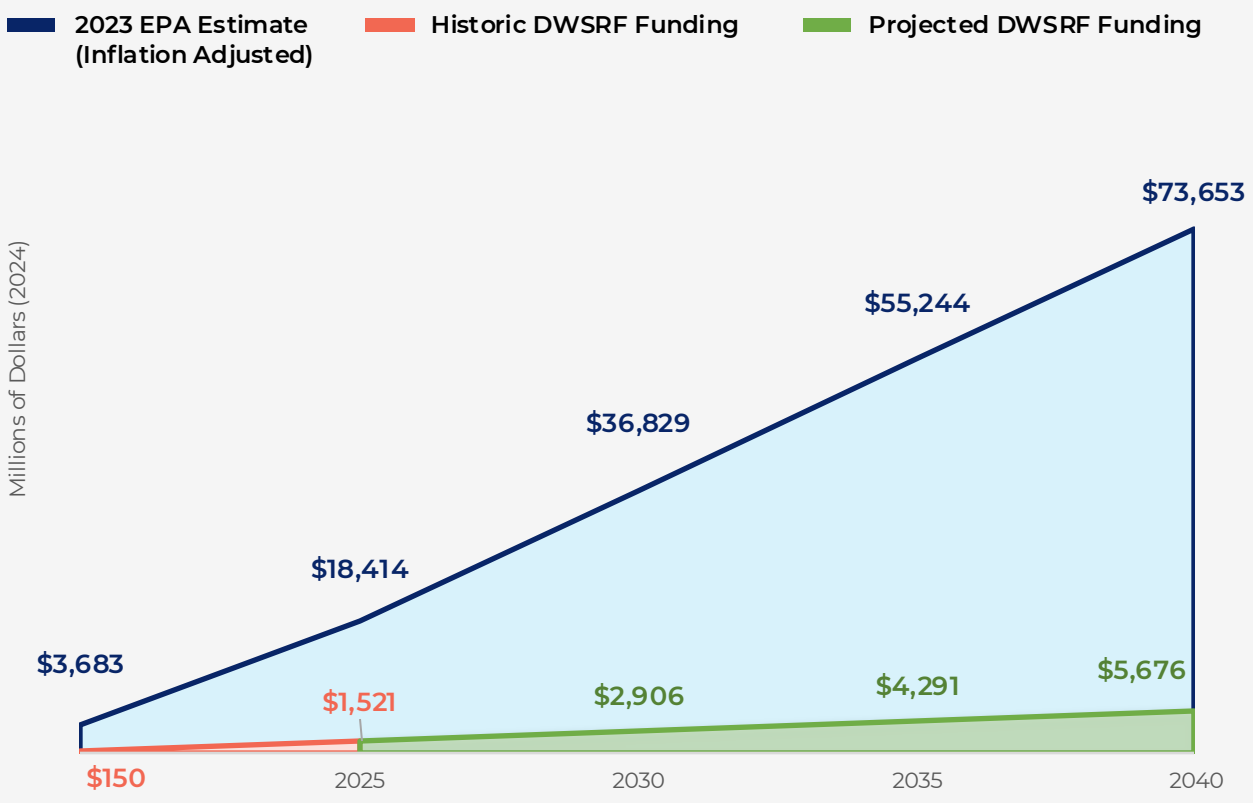
Other state financial assistance programs administered by TWDB have also funded projects listed in the State Water Plan. Since 2014, the state's revolving funds, Water Development Fund, and Economically Distressed Areas Program (EDAP), have provided over $1.4 billion in financial assistance for projects that are listed – entirely or in part – in the current or previous State Water Plans. While the efforts of these programs are significant, their funding variability combined with greater state reliance on the SWIFT, makes it difficult to determine how much funding they may contribute in future decades.

Texas' long-term funding gap for State Water Plan projects likely exceeds $32 billion. While the revised state financial assistance needs estimates account for the recent inflationary environment, they do not account for continued inflationary pressures or the rising costs attributable to public works projects.

Drinking Water Infrastructure Funding Gap: $68 Billion by 2040.

The EPA's 2023 7th Drinking Water Infrastructure Survey and Needs Assessment projects that Texas' drinking water utilities will require $61.3 billion in financial assistance over the next 20 years based on January 2021 dollars.[65] After adjusting for inflation, this cost estimate increases to nearly $73.7 billion. The chart, *Drinking Water Infrastructure Financial Assistance Needs vs. State Historic and Projected Funding (2021-2040),* depicts the level of state and federal funding effort required to achieve this level of financial assistance over the next 20 years. Between 2021 and 2025, TWDB has made a total of $1.5 billion available through the Drinking Water State Revolving Fund (DWSRF), well below the projected funding effort required. Using the assumption that future state and federal funding efforts for the DWSRF will match the annual average over the past decade ($277 million per year), Texas is on-track to provide a mere $5.7 billion in financial assistance through the DWSRF. This falls nearly $68 billion below the inflation-adjusted EPA estimate for required funding by 2040.

Drinking Water Infrastructure Financial Assistance Needs vs. State Historic & Projected Funding (2021-2040)

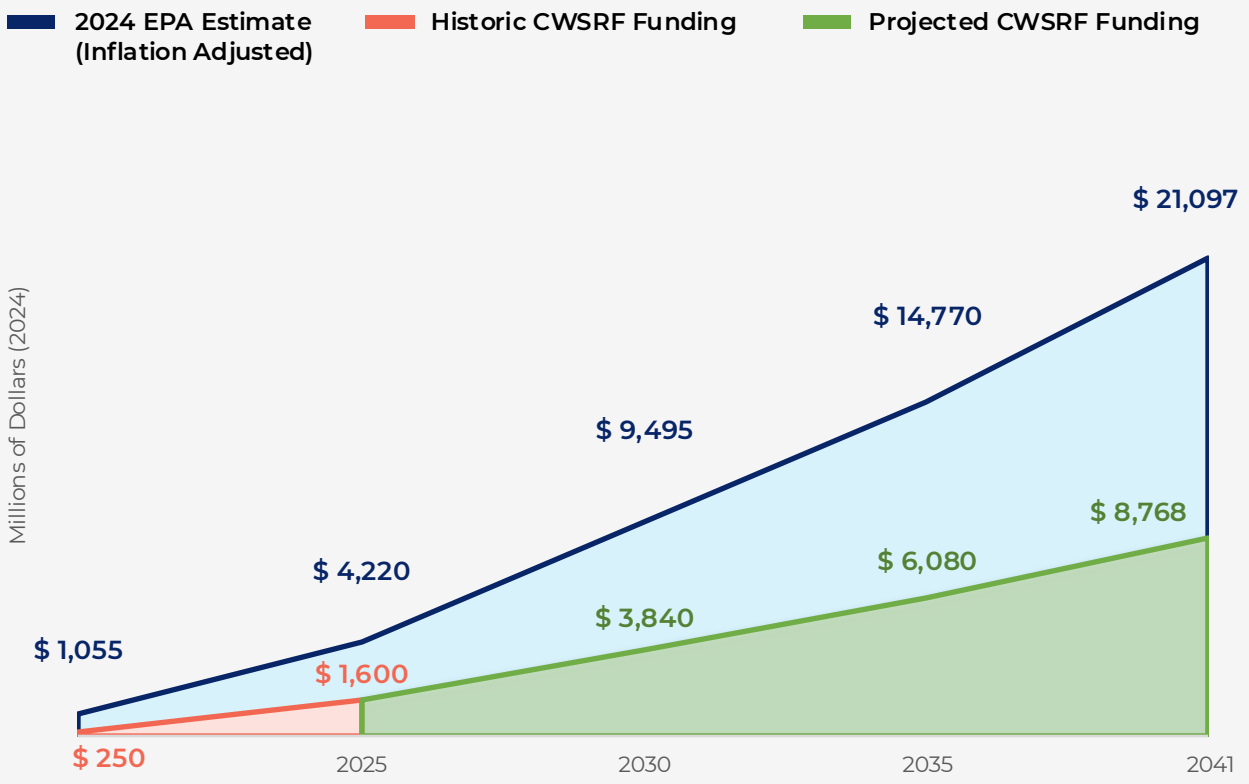


[65] USEPA, Drinking Water Infrastructure Needs Survey and Assessment, 7th Report to Congress, September 2023, page 14.

Wastewater Infrastructure Funding Gap: $12.3 Billion by 2041.

In April 2024 the EPA released its 2022 Clean Watershed Needs Survey assessing the financial assistance needs for state wastewater infrastructure. EPA's assessment, based on January 2022 dollars, estimated that Texas' wastewater operators would need $18.9 billion between 2022 and 2041.[66] Adjusted for inflation, that figure equals $21.1 billion in July 2024 dollars. The chart, *Wastewater Infrastructure Funding Needs vs. Historic and Projected Funding (2022-2041)*, includes these inflation-adjusted projections. Between state fiscal years 2021 and 2025, TWDB has allocated $1.6 billion through the Clean Water State Revolving Fund (CWSRF) towards eligible wastewater and stormwater projects. Assuming that the state and federal CWSRF funding effort between now and 2042 may equal the average annual funding effort from the past decade ($448 million per year), then the state will be able to provide $8.8 billion in financial assistance for wastewater improvement projects. This analysis indicates a long-term funding gap of $12.3 billion for Texas' wastewater infrastructure financial assistance needs.

Wastewater Infrastructure Funding Needs vs. Historic and Projected Funding (2022 – 2041)



[66] USEPA, 2022 Clean Watersheds Needs Survey, Report to Congress, April 2024, page 13.

Texas' Total Water Infrastructure Funding Gap: At Least $112 Billion.

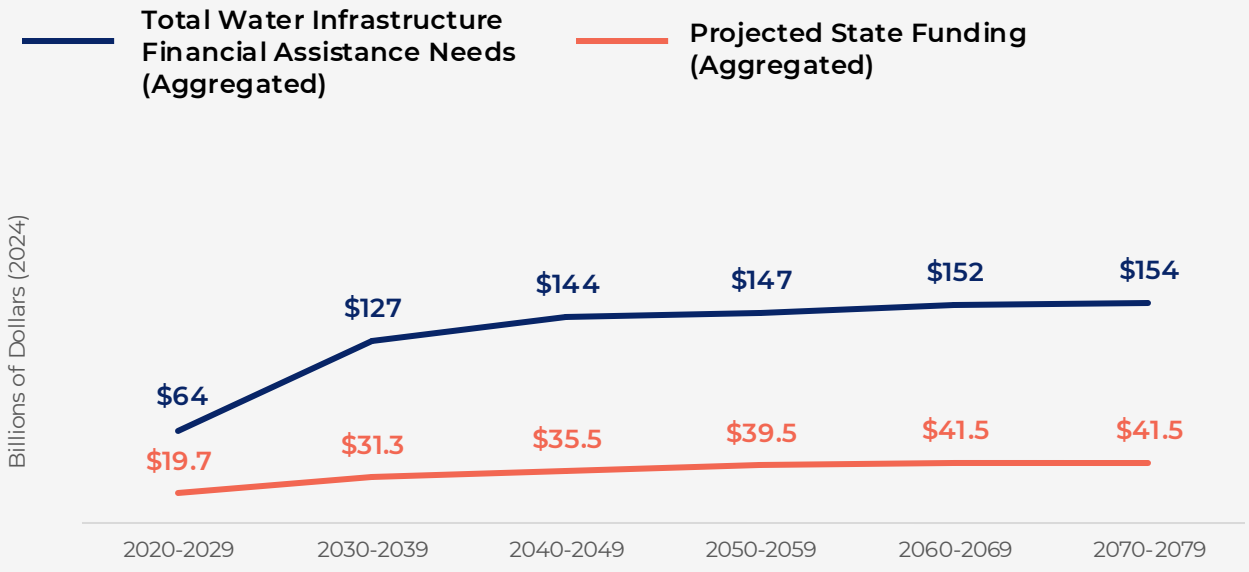
Based on existing financial needs assessments adjusted for inflation, and the historic and projected state and federal water infrastructure funding efforts, Texas faces a long-term water

infrastructure funding gap of at least $112 billion over the next 50 years. While the chart, *Texas' Water Infrastructure Funding Gap (2020-2079)*, provides a snapshot of this funding gap based on the analyzed data, several variables will affect the future estimates. Those variables that could affect the long-term financial assistance needs estimates include:

- Future State Water Plans may include different (higher or lower) state financial assistance needs estimates for water supply projects than the values reported in the 2022 plan.
- The financial assistance needs for aging, deteriorating drinking and wastewater infrastructure are based on EPA estimates through years 2040 and 2041. Future EPA estimates extending past these years may be higher than the values used for this assessment. (A review of all seven of EPA's drinking water community needs surveys since 1997 found that the financial assistance needs estimates for Texas increased an average of 35% every four years.)

Texas' Water Infrastructure Funding Gap (2020-2079)

Based on Existing Inflation Adjusted Cost Estimates and Projected Funding Efforts



This funding gap analysis also includes the following assumptions about the state's funding efforts for water infrastructure:

- The SWIFT will provide at least $27 billion in financial assistance through the 2060s. This analysis does not include the assumption that the SWIFT's capacity will expand or extend beyond the 2060s.

- State Clean and Drinking Water revolving fund funding efforts are projected through 2040 and 2041. This funding gap analysis does not project future state or federal SRF funding efforts past these years. The continuation of water infrastructure funding through these programs past 2040 and 2041 will increase the amount of projected state and federal funding. This increase would likely be offset by the rising costs attributable to the continued aging and deterioration of drinking water and wastewater systems.

Lastly, this funding gap analysis does not include the impact of the recently-created Texas Water Fund. While the one-time $1 billion appropriation to the Fund by the 88th Legislature will work to close this funding gap, and may be leveraged with existing bond programs to close it slightly further, it's too early to gauge the success of this effort.

A separate hypothetical analysis developed by Texas 2036 based on the assumption that the costs attributable to aging and deteriorating drinking water systems continue to escalate according to current projections, while state and federal revolving fund efforts continue into the 2070s based on the previous decade's funding effort, reveals a substantial widening of the anticipated funding gap. In this hypothetical example, the funding gap grew from nearly $44 billion in the current decade, to over $260 billion by 2079.

Despite recent state water infrastructure funding initiatives, including the creation of the SWIFT in 2013 and the Texas Water Fund in 2023, Texas has not applied the funding effort needed to address anticipated long-term funding gaps. Further, it is hard to predict whether future federal funding efforts will work to ameliorate this water infrastructure funding gap. Although the US Infrastructure Investment and Jobs Act of 2021 represented a slight course-correction in decades of declining federal spending on state and local water infrastructure, recent congressional earmarks have detracted from this effort. Given the projected magnitude of these funding gaps – for both needed water supply projects for drought times and fixing aging, deteriorating water and wastewater systems – Texas needs its own consistent and sustained funding effort.

CHAPTER 4

Reliable Water Infrastructure Funding Supports Economic Growth and Development

Texas' policy makers have a proven track record for adopting financial strategies aimed towards addressing long-term infrastructure needs. In 2014 and 2015, the state dedicated portions of sales and severance tax collections towards the state highway fund for the purposes of funding needed transportation projects for a growing state. In 2019, both the Legislature and state voters approved the dedication of sporting goods-related sales tax collections for the development of state parks and historic sites. More recently, and in response to the growing need for reliable, dispatchable electricity generation, the Legislature appropriated $5 billion to the Texas Energy Fund.

Texas' long-term success with regard to addressing its water infrastructure needs, and closing the anticipated funding gaps, hinges on the magnitude and duration of future funding commitments. While the $1 billion appropriated to the newly-created Texas Water Fund will certainly help advance the development of needed water supply and infrastructure rehabilitation projects, this one-time effort falls short of the $112 billion in projected unmet financial assistance needs the coming decades.

Fortunately, the Texas Water Code includes the legal authorization for several water infrastructure funds that work to address water infrastructure needs. The SWIFT, created in 2013, provides low-interest loans for water supply projects identified in the State Water Plan. Monies within the newly-created Texas Water Fund may be transferred to other TWDB-administered funds, including the SWIFT, Rural Water Assistance Fund, Water Assistance Fund, and the Texas Water Development Fund, to underwrite water supply and drinking and wastewater infrastructure projects. The 88th Legislature smartly designed the new fund to work in concert with other existing water program funds. This structure provides TWDB with the flexibility needed to allocate monies from the Texas Water Fund to other program funds tailored for certain water infrastructure project types and entities. Legally – and on paper – the State of Texas has the financial framework needed to support continued water infrastructure investments. The creation of new, additional water funds within the Texas Water Code is not needed at this time.

The success of the funds authorized within the Texas Water Code towards meeting their designed purposes depends on the extent of their capitalization, however. This section includes a series of recommendations aimed towards establishing a dedicated revenue stream for Texas' water funds that will enable those programs established by statute to work towards addressing the state's long-term water infrastructure challenges.

Recommended two-step financial strategy for the 89th legislature: dedicated funding and an additional appropriation

Step 1: Establish a dedicated revenue stream for the Texas Water Fund.

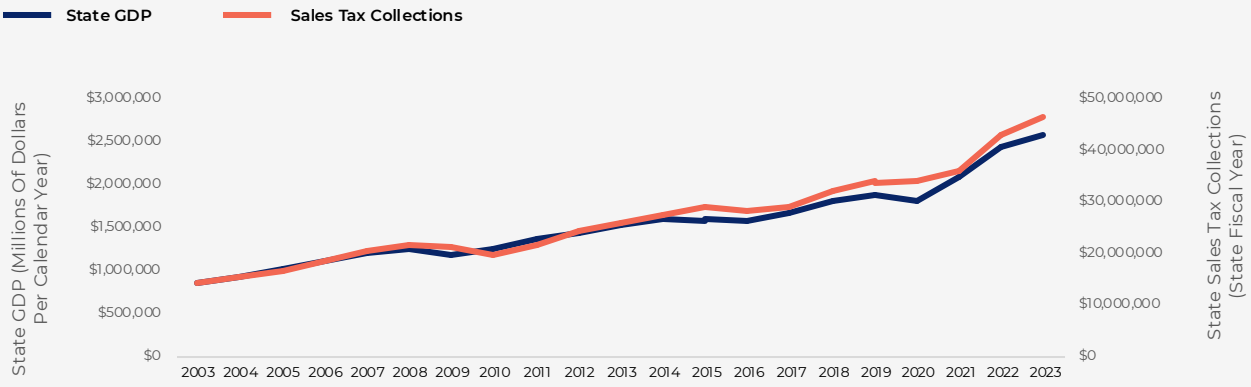
State policy makers have a basket of options available for dedicating funding for water infrastructure needs. One option would be to dedicate a set portion of sales tax collections to the Texas Water Fund. This follows the model for state highway funding approved by the Legislature and voters in 2015, where $2.5 billion of sales tax collections after the first $28 billion in collections are directed to the State Highway Fund. Another option could be to dedicate a portion of the collection of sales taxes attributable to the sale of goods and services associated with the use of state water resources (i.e. a "state water good sales tax dedication") to the Texas Water Fund. This model approximates the state sporting goods sales tax dedication approved by the Legislature and voters in 2019.

Other funding options include dedicating a portions of severance tax revenues, as currently done for state highway funding, or reallocating funds that would go towards the state's Economic Stabilization Fund (aka the "Rainy Day Fund") once ESF deposits have reached their constitutionally-authorized limit. These funding methods are volatile, however, and may not yield the consistent revenues needed for addressing the state's water infrastructure funding gap.

Given the volatility attributable to other funding streams, the dedication of sales tax revenues would provide more reliable funding for water infrastructure needs. This is because state sales tax collections grow in concert with greater state economic activity. The chart, *Texas GDP and Sales Tax Collections (2003-2023)*, illustrates this relationship. Between 2003 and 2023, state sales tax collections increased by 226%, while state GDP grew by 207%.[67] As will be discussed in this chapter, Texas' sales tax collection growth has provided reliable funding for transportation infrastructure. As the state's economy continues to grow and expand, the continued increase in sales tax revenues offer the reliable funding stream needed to underwrite Texas' long-term water infrastructure needs.

[67] State GDP data obtained from U.S. Bureau of Economic Analysis, "SAGDP1 State annual gross domestic product (GDP) summary" (accessed Tuesday, October 8, 2024). State sales tax data obtained from Office of the Texas Comptroller, "Historical All Funds Revenues Data FY 2003-2024."

Texas GDP and Sales Tax Collections (2003-2023)



As part of this recommendation, the amount of sales tax revenues dedicated to the Texas Water Fund should be at least $1 billion per state fiscal year. The dedication may begin in state fiscal year 2027 (September 2026-August 2027), and expire in FY 2053 with the option for a legislative renewal.

A $1 billion per year dedicated revenue stream would direct $25 billion to the Texas Water Fund over 25 years. If these funds are leveraged with TWDB's existing bonding authority – including its constitutionally-authorized evergreen general obligation bonding authority and revenue bonding authority under the State Water Implementation Revenue Fund for Texas (SWIRFT) – they could be used to underwrite a substantially larger portion of the state's financial assistance needs depending on the type of financial assistance provided. For comparative reference, the SWIFT, which was capitalized with $2 billion in 2013, is directed to provide at least $27 billion in financial assistance when leveraged with general obligation and revenue bond programs

Step 2: Recapitalize Texas Water Fund with an interim endowment

The Texas Water Development Board has swiftly, and prudently worked to allocate the initial $1 billion in funding for the Texas Water Fund. Should state leaders face another budget surplus during the 89th Regular Session, the Texas Water Fund should receive an additional endowment using available surplus funds. Towards that end, it is recommended that at least $5 billion be allocated towards the Texas Water Fund. Should the Legislature and Texas voters approve a dedicated revenue stream for the Fund, and the dedication takes effect in FY 2027, this additional one-time deposit would serve as needed "bridge" financing in the interim.

Dedicated funding for water infrastructure requires enhanced legislative oversight and transparency

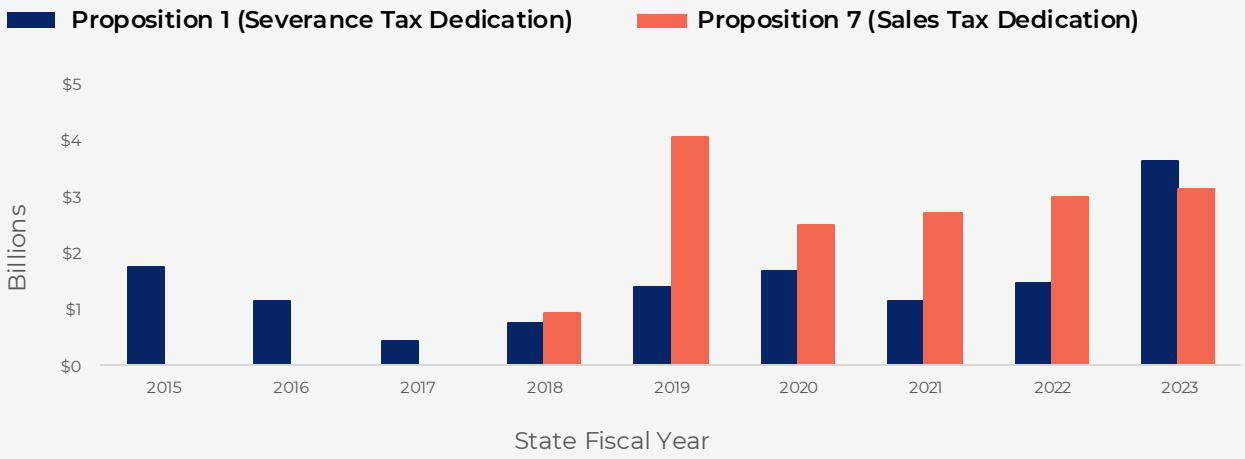
A dedicated revenue stream offers consistent, reliable funding for long-term water infrastructure needs. This funding mechanism redirects the use of funds that would have been subject to legislative oversight through the appropriations process, however. While the Legislature would retain a level of oversight over the Texas Water Development Board through the appropriations and Sunset review processes, the following recommendations aim to enhance the transparency of TWDB's use of dedicated revenues

- Expand the jurisdiction of the State Water Implementation Fund for Texas Advisory Committee to include oversight of the Texas Water Fund.
- Require that TWDB provide an annual report to the Legislature on Texas Water Fund activities, including water supply and infrastructure projects receiving financial assistance from the Fund.
- Require that TWDB develop a publicly-facing project tracker that quantifies progress made towards addressing the state's water supply deficit and aging, deteriorating water systems.

Dedicated water infrastructure funding builds on existing state policies for infrastructure needs

A dedicated revenue stream for water infrastructure replicates the successful funding model already used for state transportation projects. In 2014, state voters approved Proposition 1 authorizing the dedication of a portion of oil and natural gas severance tax collections to the State Highway Fund.[68] Despite the variability in severance tax collections attributable to volatility within the oil and natural gas markets, this dedication has yielded an average of $1.6 billion per year for the Fund since its authorization. One year later, in 2015, voters approved Proposition 7 dedicating a portion of sales tax collections to the State Highway Fund.[69] Since FY 2018 this sales tax dedication has delivered an average of $2.7 billion per year for Texas' roads and highways. The chart, *Annual Transportation Funding from Propositions 1 & 7 (2015-2024)*, below, depicts the annual sales and severance tax collections distributed to the State Highway Fund each fiscal year since 2015.

Annual Transportation Funding From Propositions 1 & 7 (2015 – 2024)

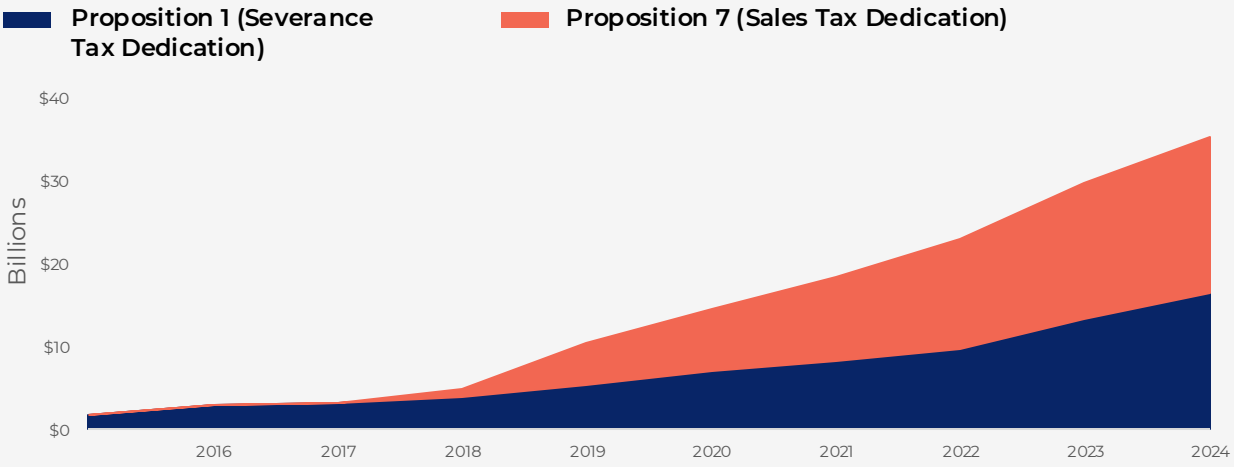


Source: Texas Department of Transportation.

Both the severance and sales tax dedications work to provide reliable, stable funding to the State Highway Fund. Between FY 2015 and 2024, a total of $16.4 billion in severance tax collections have been deposited into the fund. Proposition 7's sales tax dedication has delivered $18.8 billion for state highway projects since FY 2018. These aggregate dedications from sales and severance tax collections are depicted within the chart, *Total Transportation Funding from Propositions 1 & 7 (2015-2024),* below. This method of finance has yielded over $35 billion for the State Highway Fund over the past decade, demonstrating a proof of concept on how a dedicated revenue stream provides stable funding for needed infrastructure.

[68] Tex. S.J. Res. 1, 83d Leg., 3rd Called Session (2013).
[69] Tex. S.J. Res. 5, 84th Leg., Regular Session (2015).

Total Transportation Funding From Propositions 1 & 7 (2015 – 2024)



Source: Texas Department of Transportation.

Given the magnitude of Texas' $112 billion plus water infrastructure funding gap, and the anticipated escalation of water infrastructure funding needs, the state needs to adopt a similar method of finance for water infrastructure. This policy builds on an existing framework – already approved by the Texas Legislature and state voters – for financing needed highway projects for a growing state. A dedicated funding strategy works to finance and facilitate the expansion of roads and highways for a growing population. This same financial strategy offers reliable funding for water infrastructure and provides a firm foundation for continued economic growth.

Water infrastructure investment supports continued economic growth and job creation

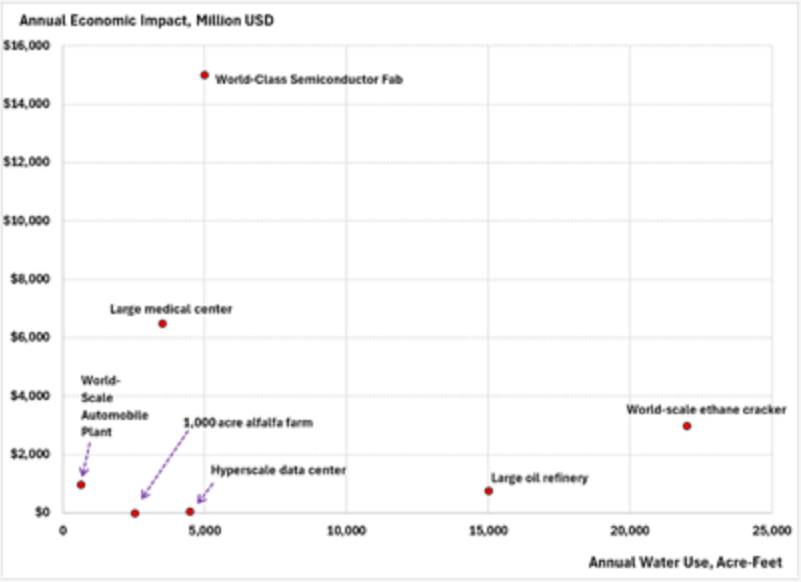
Water infrastructure investment supports continued GDP growth

Texas' economy has grown by 62% over the past decade. In 2023, the state's GDP totaled $2.583 Trillion, representing 9.3% of all US GDP.[70] This growth trajectory reflects several phenomena, including greater oil and gas production, increasing energy exports to domestic and international markets, manufacturing growth, housing expansion, industrial nearshoring, and, among others, corporate relocations to Texas. The continuation of this growth trajectory depends on three critical elements, including electric reliability, qualified workforce availability, and water infrastructure reliability.

[70] U.S. Bureau of Economic Analysis, "Table 1.1.5. Gross Domestic Product" (accessed Wednesday, October 9, 2024).

Expanding Texas' water supply portfolio accomplishes two key economic objectives. First, this effort makes Texas more resilient to future severe droughts. Second, water supplies work to support increased economic activity. According to one study, each 100,000 acre-foot increment of water supply could potentially support $30 billion in economic activity.[71] This economic potential depends on the intrinsic and generative value of the industries using the supplied water. This relationship is illustrated in the graphic, *Annual Economic Impact vs. Annual Water Use for Selected Industries*, below.

Annual Economic Impact vs. Annual Water Use for Selected Industries



Source: Gabe Collins, Prospective Costs & Consequences of Insufficient Water Infrastructure Investments in Texas, 2024, [manuscript submitted for publication].

The expansion of new industries in Texas will come with additional water demands. New petrochemical facilities, such as oil refineries and ethane plants, will require between 15,000 to 23,000 acre-feet of water per year while yielding between $750 million and $3 billion in economic impact. A similar correlation could be seen with the expansion of the hydrogen industry in Texas. New semiconductor plants will require at least 5,000 acre-feet of water per year in order to yield nearly $15 billion in annual economic value. Expansion of other industries, including automotive and aerospace manufacturing, residential construction, pharmaceutical development, and data centers, to name a few, will require reliable water infrastructure in order to yield meaningful economic returns.

The decisions to build new plants and facilities are market driven. To be sure, Texas' tax, regulatory and economic environment supports these business decisions. The availability of reliable water infrastructure, however, works as the necessary condition to guarantee their fruition

[71] Gabe Collins, Prospective Costs & Consequences of Insufficient Water Infrastructure Investments in Texas, 2024, [manuscript submitted for publication].

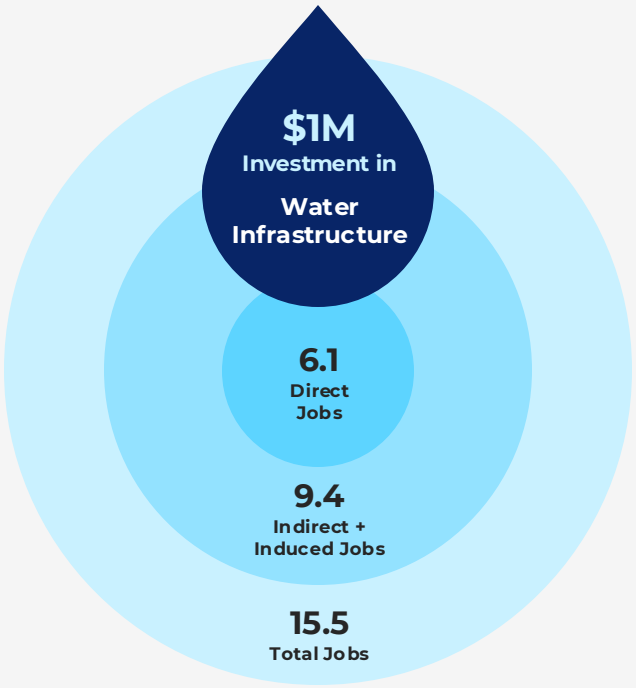
Just as reliable water supplies will support continued economic growth, addressing the problems attributable to aging, deteriorating water and wastewater systems offers to do the same. Unreliable aging, deteriorating drinking water and wastewater systems present an economic drag. Conversely, improved reliability and water quality offer enhanced productivity and efficiency in other sectors, contributing to greater investment according to the Value of Water Campaign's analysis.[72] On the national level, water infrastructure upgrade investments are projected to yield over $5.5 trillion in GDP over the next 20 years. In Texas, the economic returns to fixing aging, deteriorating water systems could equal $489 billion in GDP gains over the same time period. This growth benefit comes in addition to that from mitigating the economic consequences attributable to unreliable water systems.

Water infrastructure investment supports job creation

According to the Value of Water Campaign, each $1 million of investment in water infrastructure generates over 15 jobs.[73] Of those 15, at least six jobs created are directly attributable to the infrastructure investment. These include the design, engineering, and construction of the needed infrastructure. Another nine jobs are created through indirect and induced impacts. These include jobs supported through the purchase of goods (e.g. pipes, computers, and heavy machinery) and services (e.g. retail and medical) attributable to infrastructure development. The Value of Water campaign's analysis concludes that this aggregate employment impact is comparable to similar public investments in energy, health care and transportation.

Beyond the jobs directly attributable to water infrastructure development, these investments support economic expansion that, in turn, generates greater jobs.

Jobs Supported Per $1 Million Investment in Water Infrastructure



Source: Value of Water Campaign, The Economic Benefits if Investing in Water Infrastructure. 2017

[72] Value of Water Campaign, The Economic Benefits of Investing in Water Infrastructure, How a Failure to Act Would Affect the US Economic Recovery, 2020, page 28.
[73] Value of Water Campaign, The Economic Benefits of Investing in Water Infrastructure, 2017, page 9.

CHAPTER 5

Policy Background

Since the Drought of Record of the 1950s, the Texas Legislature has created several funds, and voters have approved multiple bond authorizations, for providing financial assistance for water infrastructure projects. Between 1957 and 2024, the Texas Water Development Board (TWDB), committed a total of nearly $36 billion towards water infrastructure projects.[74] The majority of this financial assistance, just over $20 billion, has been committed by TWDB since 2010.

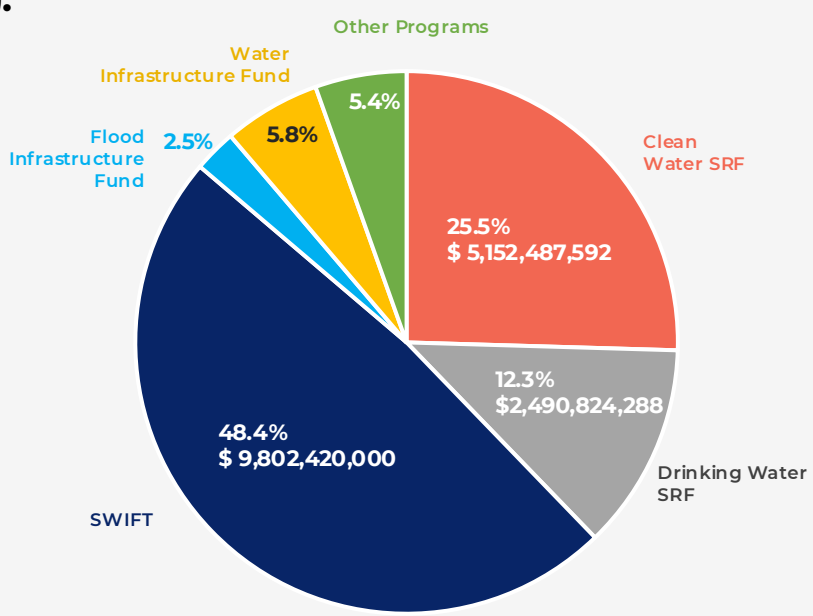
The majority of financial assistance provided by TWDB for local and regional water infrastructure projects has been delivered through three key water funds. These include the State Water Implementation Fund for Texas (SWIFT), the Clean Water State Revolving Fund (CWSRF), and the Drinking Water State Revolving Fund (DWSRF). Two other key funds include the Flood Infrastructure Fund (FIF), established in 2019, to finance flood control and mitigation projects, and the Water Development Fund.

In 2023, the Texas Legislature and state voters approved the creation of a new water infrastructure fund, the Texas Water Fund. The 88th Legislature authorized a one-time appropriation of $1 billion to the Texas Water Fund effective on January 1, 2024. While the chart, *TWDB Financial Assistance Commitments (2010-2024)*, does not yet include Texas Water Fund commitments, this new fund will make in-roads towards financing water infrastructure projects once TWDB makes specific project funding commitments.

This chapter provides a brief description of the state's primary water infrastructure funds, including when they were created, what types of projects they support, and how much financial assistance has been provided by each since 2010.

TWDB Financial Assistance (2010-2024): $20.2 Billion

Commitments Between January 1, 2010 to June 30, 2024



[74] Texas Water Development Board, "Funding Commitments Since Inception: 1957 - February 2024," accessed on September 12, 2024.

The State Water Implementation Fund for Texas (SWIFT)

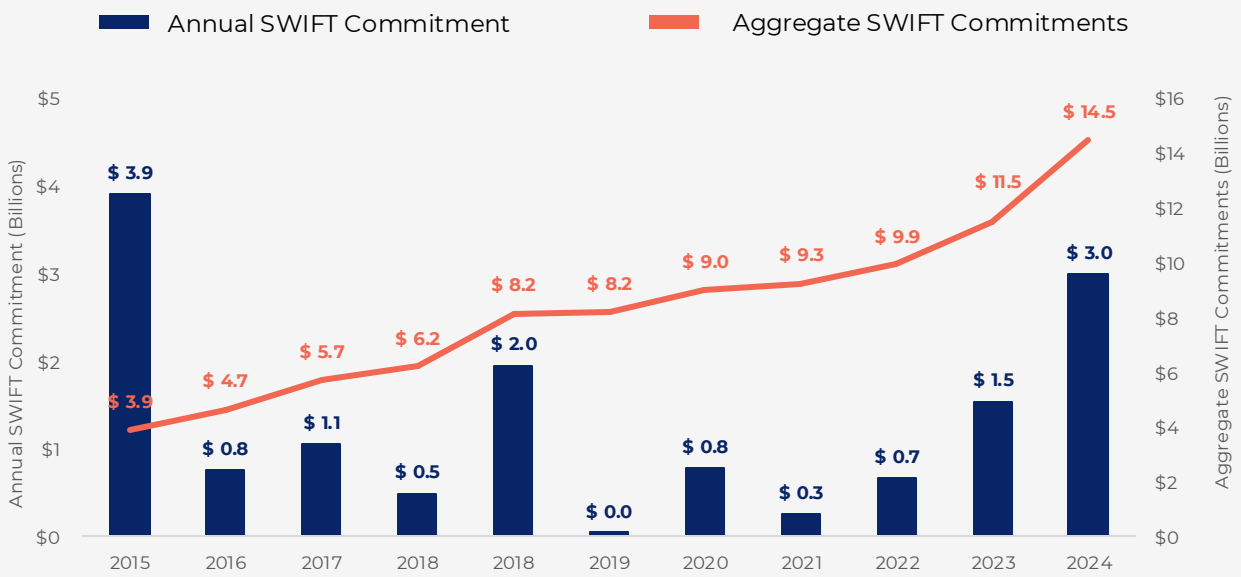
The SWIFT, and its associated revenue bond program, the State Water Infrastructure Revenue Fund for Texas (SWIRFT), was approved by an amendment to the Texas Constitution in 2013. The Legislature capitalized the SWIFT with $2 billion and authorized TWDB, in partnership with the Texas Treasury Safekeeping Trust Company, to invest the initial endowment.

The SWIFT may only be used to provide financial assistance for water supply projects listed in the State Water Plan. The program provides below market interest rate loans for the development of water supply projects. Grants from the SWIFT are prohibited by law.

The SWIFT essentially works as a subsidized debt program. First, TWBD issues a bond, which could be a general obligation, taxable, or revenue bond through the SWIFT. TWDB then uses those bond proceeds to provide low interest loans for state water projects developed by local or regional governments. Proceeds from the SWIFT are used to subsidize the interest owed on the issued bond. This allows TWDB to provide low-interest loans for water projects that are below market rates. In addition to debt subsidization, the SWIFT may be used as a credit enhancement towards guaranteeing the bonds issued. This works to secure competitive market rates for bonds.

Since its inception, the SWIFT has provided nearly $14.5 billion in commitments for State Water Plan projects. The chart, SWIFT Funding Commitments (2015-2024), illustrates the total amount of commitments made per year since 2015 and the aggregate commitment amount over time. The debt subsidization offered through the SWIFT has provided over $1.3 billion in savings since 2015.

SWIFT Funding Commitments (2015-2024)



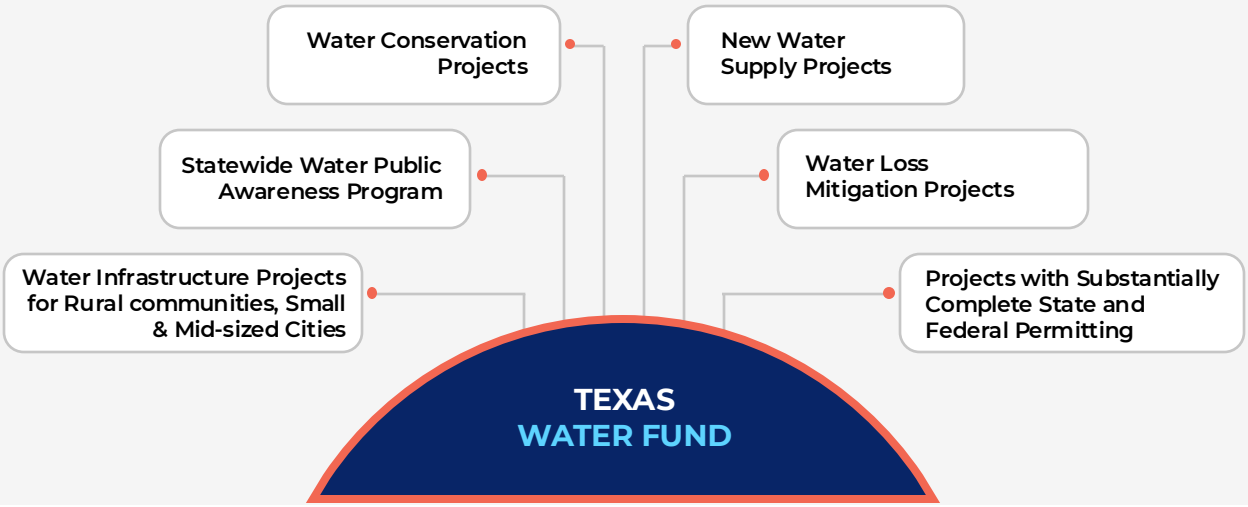
Source: Texas Water Development Board.

Texas Water Fund

During the regular legislative session in 2023, the Legislature approved a legislative package aimed at both delivering new water supplies and fixing aging, deteriorating water systems. The legislation that makes up this package, Senate Joint Resolution 75, Senate Bill 28, and Senate Bill 30, work in concert to create a new fund, the Texas Water Fund, and capitalize that fund with a $1 billion down payment.

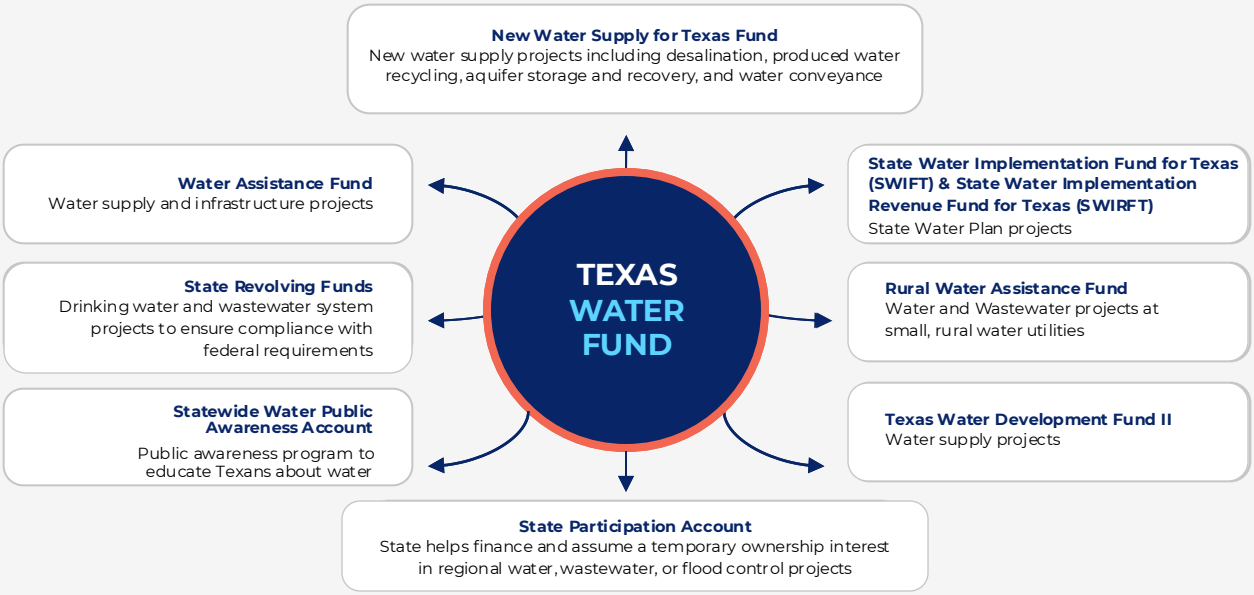
Senate Bill 28 (88R) instructs which types of water infrastructure projects are eligible to receive financial assistance through the Texas Water Fund. These include new water supply projects, such as desalination and aquifer storage and recovery, water conservation and loss mitigation, as well as water infrastructure projects for small, rural, and mid-sized communities.

Types of Projects Eligible for Texas Water Fund Financing



The Legislature designed the Texas Water Fund to work in concert with other existing water funds. As illustrated in the graphic, *Water Funds Eligible to Receive Texas Water Fund Financing*, monies in the Texas Water Fund can be transferred to other TWDB-administered water funds, including the SWIFT, to provide financial assistance for water infrastructure projects. This design enables TWDB to better leverage TWF funds and tailor financial assistance through different funding programs that work for specific project types and political subdivisions.

Water Funds Eligible to Receive Texas Water Fund Financing



In the short period of time since the Texas Water Fund's creation, TWDB has proposed allocating the $1 billion within the Fund to other eligible water infrastructure funds. This includes the allocation of $195 million to the Rural Water Assistance Fund, $300 million towards the SWIFT and $250 million to the New Water Supply for Texas Fund.[75]

Clean and Drinking Water State Revolving Funds (CWSRF & DWSRF)

The other major funds used by TWDB for providing financial assistance for water and wastewater infrastructure projects include the Clean Water State Revolving Fund (CWSRF) and the Drinking Water State Revolving Fund (DWSRF). The CWSRF is used for projects that ensure compliance with the pollution control requirements of the US Clean Water Act. The DWSRF is used for assisting utilities with compliance with the drinking water standards prescribed within the US Drinking Water Act. Between 2010 and 2024, CWSRF has committed $5.2 billion in financial assistance towards eligible projects. DWSRF has committed $2.5 billion during the same period.

Both state revolving funds use a mixture of state and federal dollars. The Environmental Protection Agency receives congressional appropriations for the revolving funds that the EPA, in turn, makes available to the states. In order to receive these federal SRF dollars, states need to provide matching funds of their own. The SRFs are then used to provide low-interest loans or grants to eligible entities.

[75] Texas Water Development Board, "Texas Water Fund Implementation Plan," Agenda Item Memo, July 23, 2024.

In 2021 Congress passed the US Infrastructure Investment and Jobs Act authorizing additional allotments to state SRFs. While seen as a course-correction to decades of declining federal spending on state and local water infrastructure, IIJA required that substantial portions of state SRF dollars be allocated towards specific purposes, including lead service line replacement and emerging contaminant remediation. Shortly after its passage, IIJA was projected to provide nearly $2.5 billion towards Texas' SRFs over the course of five years. Since 2022, however, congressional earmarks have been deducted from the amounts that would have gone towards state SRF programs. As a result of this practice, Texas' SRF programs have lost over $100 million in potential funding towards earmark programs for other states.[76]

Other Key Water Funds

While the Texas Water Fund, the SWIFT, and the SRFs serve as Texas' key water infrastructure funds, there are several others that are used by TWDB for specific purposes. These other funds include the following

- **New Water Supply for Texas Fund**
  Created by Senate Bill 28 in 2023, this fund may be used for developing water projects that deliver new sources of water. Eligible projects include brackish groundwater desalination, seawater desalination, aquifer storage and recovery, and water imported from elsewhere.

- **Texas Water Development Fund**
  This fund may be used for the planning, design, and construction of water supply, wastewater and flood control projects. The Texas Water Development Fund, also referred to as "Dfund", has provided over $1.1 billion in financial assistance since 2010.

- **Flood Infrastructure Fund (FIF)**
  Created in 2019, the Flood Infrastructure Fund provides financial assistance for drainage, flood control and flood mitigation projects. The FIF has provided just over $500 million for flood projects since its inception.

- **Rural Water Assistance Fund (RWAF)**
  This is a state-funded program for water and wastewater projects for small and rural communities.

- **Economically Distressed Areas Program (EDAP)**
  Facilitates implementation of water supply and wastewater projects in economically distressed areas. Between 2010 and 2014, EDAP has provided $318 million in financial assistance.

[76]Council of Infrastructure Financing Authorities, "Impact of Congressional Earmarks on Annual Federal Funding for Water Infrastructure," accessed on September 13, 2024.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