



INFRASTRUCTURE
TEXAS
REPORT CARD

2025

ASCE

AMERICAN SOCIETY OF CIVIL ENGINEERS

TEXAS SECTION

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TEXAS GRADES



AVIATION
B



BRIDGES
B-



BROADBAND
D+



DAMS
D+



DRINKING WATER
D+



ENERGY
C



HAZARDOUS WASTE
C+



LEVEES
D-



PORTS
C+



PUBLIC PARKS
C-



RAIL
C



ROADS
C-



SOLID WASTE
C+



STORMWATER
C-



TRANSIT
D+



WASTEWATER
D-

ABOUT THE GRADES

Infrastructure is graded based on eight criteria: capacity, condition, funding, future need, operation and maintenance, public safety, resilience, and innovation.



Exceptional,
Fit for the Future



Good,
Adequate for Now



Mediocre,
Requires Attention



Poor,
At Risk



Failing/Critical,
Unfit for Purpose

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Texas Section ASCE

As civil engineers in the state of Texas, we have a responsibility to protect the health, safety, and welfare of the public. ASCE believes part of this responsibility includes providing the public and our elected leaders with critical information about the current state of our infrastructure, the backbone of Texas' economy; growing to the 9th largest in the world. With this knowledge, the public will increase support for infrastructure improvement and maintenance. Subsequently urging elected leaders to prioritize funding, so our vital infrastructure meets the current and future needs of all Texans.



AVIATION

Texas remains a crucial geographic hub for domestic and international air passenger travel, as well as air freight, boarding 90 million passengers and reported moving three million tons of cargo in 2022. Texas has six of the top 50 busiest airports in the US. The airfield infrastructure condition remains good overall. As passenger traffic returns to or exceeds pre-pandemic levels, strains are placed on terminal facilities. Airports have used the Federal Aviation Administration (FAA), Infrastructure Investment and Jobs Act (IIJA), and local funds to increase terminal capacity over the last several years. General Aviation airports continue to grow, with 9,100 aircrafts based throughout the state and 5.7 million operations contributing approximately \$2.5 billion to the state economy. Texas has made significant progress in bridging the funding gap thanks to increased state funding alongside federal support, enabling a substantial rise in planned projects for the upcoming years.



BRIDGES

Bridges in Texas include 56,000 bridge structures and bridge-class culverts, which support 616 million vehicles daily. Ongoing investment and maintenance are necessary to support Texas' growing economy and population, which currently exceeds 30 million and is projected to increase 34% by 2050. Despite significant efforts, including an annual investment of \$1.1 billion to expand bridge capacity and \$736.4 million for preservation, funding remains insufficient to meet anticipated demands. A significant challenge is addressing aging infrastructure. Over 42% of bridges were constructed before 1974. Tackling these challenges requires innovation in technologies and resilient design. The state's proactive measures in public safety and bridge inspection programs have reduced the percentage of bridges in poor condition from 1.26% to 1.23%. The longevity and safety of Texas' bridge network will rely on substantial annual future investments, estimated at \$2 billion for expansion and \$1.8 billion for maintenance.



BROADBAND

Texas is actively working to improve broadband access through federal appropriations and state-level initiatives. The digital divide in Texas persists due in part to infrastructure limitations, cost of deployment, service affordability challenges, and digital literacy gaps. This digital divide affects nearly one-quarter of the state's population, primarily those in rural and remote areas. Broadband access is crucial for virtual learning, telehealth, online commerce, and economic opportunity. Closing the digital divide remains essential to ensure equitable access for all Texans. Expanding broadband infrastructure across the state can be challenging due to its size. Regardless, with strategic investments, cross-functional collaboration, and a process to apply for funding, the state can bridge the digital divide and ensure that all Texans benefit from fiber-broadband access. However additional comprehensive data for broadband is necessary to thoroughly assess infrastructure, deployment progress, and federal and state programs.



DAMS

Dams in Texas serve many purposes, including recreation, flood risk mitigation, irrigation, water supply, and fire protection. About 1 in 3 of the state's dams address flood risk mitigation, and one in seven support irrigation or water supply. Dams carry significant value and substantial risk, as failures can result in loss of life and property. Of the estimated 7,378 non-federal dams, approximately 25% could result in loss of life should they fail. Underfunded and understaffed regulatory agencies compromise the safety of these structures. Over 3,200 Texas dams are exempt from dam safety requirements by state legislation. In 2023, the Association of State Dam Safety Officials (ASDSO) estimated \$13.6 billion to rehabilitate all non-federal dams in Texas. The Texas State Soil and Water Conservation Board (TSSWCB) estimates that about \$2.1 billion is needed to repair or rehabilitate dams included in the Small Watershed Programs.



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DRINKING WATER



Funding safe and adequate drinking water supplies is essential to continue fostering growth and prosperity and is imperative to the State's economy. The importance of planning for adequate water supplies is demonstrated by Texas' legislation that requires the Texas Water Development Board (TWDB) to develop a State Water Plan (SWP). The SWP is updated every five years and incorporates sixteen regional water plans, which guide the state water policy. The state population is projected to grow from 32.9 million in 2030 to approximately 53.2 million by 2080. Additionally, the number of boil water advisories has doubled from 2020 to 2023, indicating a need to address aging infrastructure and for additional investments across infrastructure operation and maintenance. Furthermore, the number of Public Water Systems with limited water use to avoid shortages has increased from 46 in 2019 to 571 systems in 2023, affecting approximately 6.4 million people.



ENERGY



Texas supplies approximately 25% of the nation's energy needs. The uniqueness of our State's energy requires a comprehensive and separate analysis of the electric and the non-electric energy produced to understand the critical reliability and resilience issues while evaluating the integrated requirements throughout the system. Texas' energy infrastructure system introduces two characteristics different from other infrastructure systems. First, market forces, influenced by regulations, drive investments in expansion, reliability, and resilience. Second, investments are predominantly underwritten by private markets. Recent extreme weather exposed underinvestment problems in the transmission & distribution network and revealed shortcomings in storm response and resilience. The Texas energy sector faces many challenges that are further complicated by lagging regulation, market uncertainty, unprecedented demand growth with an increasing population, and private industry, like data center expansions. Recent legislative solutions have continued to be tested by extreme weather and demand, leaving Texas' energy infrastructure vulnerable.



HAZARDOUS WASTE



Over the past four decades, the Texas Commission on Environmental Quality (TCEQ) has effectively managed over 19 million tons of hazardous waste through state regulations aligning with federal hazardous waste infrastructure standards.

Texas programs, supported by public and private funding, have improved to meet the demands of increasing hazardous waste generation from our booming economy. Limited TCEQ staffing hampers these efforts with the agency's ability to address challenges such as the increasing number of EVs and the potential surge in large waste batteries, emerging contaminants like PFAS, and rising sea level threats to contaminated sites, all adding to future needs. Texas must tackle these unknown and unquantified challenges. Over the next 20 years, a dedicated focus must be on recycling, reuse, waste diversion, pollution prevention, industrial process minimization, reducing air pollution emissions from hazardous wastes, and managing new hazardous waste influxes from EVs and new renewable energy products. Policy development and guidance are necessary to address emerging issues. Partnerships with academic institutions can support efforts to review regulations and address future concerns. Due to hazardous waste management and remediation costs, the private sector must continue funding most improvements. New or revised regulations and policies to incentivize markets will ensure changes are commercially driven and build on existing private sector growth and investments.



LEVEES



Texas relies on a network of levees to protect communities from hurricanes, storms, and floods. There are 234 levee systems throughout the state, providing 1,342 miles of protection for 1.5 million residents. The levee systems also safeguard 431,478 properties on approximately 208,382 acres of agricultural land, having a collective value of \$248 billion. This economic impact underscores the crucial importance of the levee systems in Texas's infrastructure to mitigate the effects of floods. While rare, failures can and do occur. The system continually faces stressors, which test the infrastructure's integrity, with increasing frequency and storm intensity. The remaining challenge exists to comprehensively manage the state's existing levee infrastructure assets and provide funding to owners of levees. Accuracy in the inventory of assets will support directing funds to necessary entities and remove inaccurate presumed deficiencies.



PORTS



Texas ports handle over 600 million tons of cargo annually and are the nation's top exporter by tonnage. According to the Texas Ports Association (TPA), ports in Texas are essential to the state and generate \$450 billion in total economic value. Several factors impact port operations as waterborne tonnage continues to expand due to economic activity. These factors include increased ship sizes and traffic in ship channels, resiliency in the face of more frequent storm events, increased demands for cybersecurity, and rising construction and equipment costs. The overall condition of Texas ports is good, but significant improvements and expansions are required to mitigate the factors affecting operations. Since 2010, Texas' population has increased by 19% or roughly 5 million people, and Texas ports require increased funding to maintain this growth and economic prosperity for the state.



PUBLIC PARKS



Texas contains some of the most diverse public lands in the country, including 14 national parks, 88 state parks, and numerous county & local parks covering 70 million plus acres, which showcase natural treasures and community greenspaces. The Texas Parks and Wildlife Department (TPWD) is the state agency whose mission is to manage and conserve the natural and cultural resources of Texas and to provide hunting, fishing, and outdoor recreation opportunities for the use and enjoyment of all generations. Multiple allocations and appropriations passed by the Texas Legislature help fund TPWD. The 2025 fiscal year budget of \$534.1 million supports state parks' operation, maintenance, and protection, but historically, funding has fallen short due to diversions. Texans, however, passed Proposition 14 in 2023, which created a centennial parks conservation fund to invest more than \$1 billion to establish and improve state parks. In 2021, Texas voters approved Proposition 2, which authorized county infrastructure bonds to improve blighted areas for county and local parks. Additionally, recent voter approval in several municipalities, cities, and counties to increase bond funding for park infrastructure demonstrates Texas' commitment to parks. Parks preserve scenic natural treasures and conserve wildlife and their habitats while allowing the public to enjoy recreational resources. Meanwhile, state parks also serve as emergency shelters during crises such as hurricanes and floods. With over 95% of Texas land privately owned, counties and cities depend upon donations to acquire properties and designate them for public use. However, because of Proposition 14, additional funding will help secure the future of state parks for generations to come.



RAIL

Texas has the largest rail network in the country, with more than 10,400 miles of track and a substantial number of Class I railroads, short lines, and regional rail operators. In particular, freight rail in Texas plays a critical role in the state's economy, given its size and position as a central transportation hub for the U.S. Both freight and passenger rail receive private and public funding that ensures rail continues to be a key part of the transportation network in Texas. The state's freight rail system handles various commodities, including oil, gas, agricultural products, chemicals, and consumer goods. It is funded predominantly by private investment from railroad companies like Union Pacific Railroad (UP) and Burlington Northern Santa Fe Railway (BNSF), with occasional public support for projects that benefit the broader economy or public infrastructure. Freight rail is generally in better condition than Passenger Rail. Current passenger rail services run (through agreements) on the existing Freight Class I rail network. There is no High-Speed Rail (HSR) currently operating in Texas. Federal and state governments provide subsidies, particularly for Amtrak, with opportunities for private investment in special projects like HSR. Public funding also supports safety improvements and new rail corridors.



ROADS

Texas boasts an expanding massive road network to keep pace with a growing population driving 51.2 billion miles in 2023. Rising congestion, up 7% over 2021, is an ongoing challenge and requires funding and innovation to maintain the good pavement conditions of nearly 90% of our roads. Texas tackles congestion by dedicating significant resources to roadways and exploring innovative solutions such as traffic flow technology. Safety remains essential, with 4,268 fatalities in 2023, \$3 billion is allocated for safety projects. Despite public awareness campaigns and other projects, fatalities persist, which have prompted many local Vision Zero initiatives. Funding for our roads comes from sources such as the Infrastructure Investment and Jobs Act (IIJA), gas taxes, registration fees, bond programs, and new electric vehicle fee. Continued increases in the number of vehicles emphasize the need for continued investment. The Texas Department of Transportation (TxDOT) is preparing for the future by planning to invest over \$37.2 billion for development, delivery, and maintenance of state highway projects to facilitate safe travel on our roadways. Overall, Texas is working diligently to keep its transportation system moving.



SOLID WASTE

Texas' population continues to grow, and with that comes an increase in the amount of waste generated, 39.73 million tons. The 2022 Data Summary report published by the TCEQ found that Texans' average disposal rate of 7.25 pounds per person per day continues to climb at rates that exceeded the national average. The United States Environmental Protection Agency (EPA) delegates the authority to permit and regulate all municipal solid waste (MSW) facilities in the state to the TCEQ, while a combination of public and private entities provides solid waste management services in the state. Texas currently has an average of 51 years of reserve capacity statewide, but continued population growth will result in an uneven distribution of Texas' reserve waste disposal capacity. Most large metropolitan cities in Texas have robust recycling collection programs and access to infrastructure to divert material from direct disposal. However, some urban and many rural areas still lack access to recycling programs due to a shortage of infrastructure and process centers. While a new recycling facility opened in San Antonio in August 2024, that is the only one scheduled to come online, which will not keep pace with the growing population. A general lack of recycling facilities continues to be a problem in the state, where municipalities have difficulty funding their annual budgets. Over the next four years, improvements in solid waste recycling and diversion would provide more options for Texas' solid waste management programs.



About ASCE Texas

ASCE Texas Section is one of the largest and most active sections of the American Society of Civil Engineers. Established in 1913, the Texas Section represents more than 11,000 members across the state. Headquartered in Austin, the Texas Section unites 15 local Branches, 7 Technical Institute Chapters, and 24 Student Chapters. ASCE Texas Section belongs to ASCE's Region 6, which includes the Mexico, New Mexico, and Oklahoma Sections. ASCE has 150,000+ global members. We support & encourage the equitable opportunity for participation by all. Learn more at TexASCE.org.



STORMWATER



According to the 2024 State Flood Plan, nearly 5 million Texans currently live or work in high-risk flood zones, and with projected population growth and increasingly severe storms, it is critical to improve stormwater infrastructure. While it is nearly impossible to eliminate all flood risk during extreme storm events, state and local leaders have advanced strategies to enhance the technical analysis of risk, developed risk mitigation and resilience solutions, and identified and dedicated the necessary funding. The Texas Water Development Board (TWDB) completed Texas' first comprehensive State Flood Plan in 2024, a herculean effort identifying flood risk across the state and consolidating recommended solutions from 15 flood planning regions. The estimated cost to develop solutions is over \$54 billion and includes, studies, design, and construction projects.



TRANSIT



Public transit services in Texas are provided primarily by three entities: rural transit districts, large and small urban transit districts, and metropolitan transit authorities. Across the state, public transit ranges from light rail and bus services to on-demand and curb-to-curb shuttle and van rides. A combination of federal, state, and local funding mechanisms helps fund Texas Transit. The Texas triangle (Dallas-Fort Worth-Houston-San Antonio/Austin) continues to experience rapid growth. Texas now has 42 cities with a population of 100,000 people or more and a non-urbanized population of 6.9 million, accounting for only 24% of the total state population. Eight metropolitan authorities, 32 large and small urban area transit districts, and 36 rural transit districts accounted for 205 million rides in 2023, with 89% of those rides taking place within the area of the metropolitan districts. Ridership is up from the previous year and continues to recover from the effects of the COVID-19 pandemic. Service has returned to within 2% of pre-pandemic levels, and ridership is at approximately 75% of pre-pandemic levels. As Texas' population grows and urbanizes, project costs increase, and right-of-way becomes limited, transit will become an increasingly important travel mode. Funding transit will be critical. According to a 2018 report, multi-year capital needs for transit in Texas require an annual funding level of approximately \$4 billion.



WASTEWATER



The wastewater sector in Texas is currently resource constrained, whether it's funding from federal, state, or local agencies, personnel for operating and maintaining wastewater infrastructure, or science and engineering professionals needed to develop quicker, cost-effective, and resilient solutions. The growing population is not only adding demand but also expanding and increasing decentralized systems permits by 30%. Furthermore, the funding available from federal and state sources falls short of effectively meeting the demands for new infrastructure and rehabilitation. Although innovative and resilient efforts in wastewater initiatives are underway, the essential funding significantly surpasses these efforts. To improve the current wastewater infrastructure conditions, the wastewater industry must secure additional funding for new infrastructure, rehabilitation, and replacement of existing systems. Funding may require educating wastewater users on issues impacting functionality of the system alongside implementing rate increases. Additionally, discussions with Federal and State government officials regarding future wastewater funding opportunities are necessary. Texas wastewater professionals will continue to find more innovative, resilient, cost-effective solutions that both protect the state's natural resources and improve its infrastructure.

See back cover for recommendations to raise the grade.

THESE RECOMMENDATIONS SUPPORT A VISION FOR A SAFE, RELIABLE, AND EFFICIENT INFRASTRUCTURE IN TEXAS THAT WILL CONTINUE TO DRIVE PROSPERITY AND THE ECONOMY FORWARD.

How We Can Raise The Grade



INFRASTRUCTURE INVESTMENT

Infrastructure systems provide the essential physical facilities that allow people to move, produce goods and services, grow and expand business and commerce, manage waste for safe and healthy environments, and access clean water. They are the backbone of economies. Investments are required to develop and maintain conditions for these systems that are sufficient to operate and are safe for intended use. Additional dedicated infrastructure investment is needed across all infrastructure categories to expand, maintain, and operate efficiently.

- Appropriate funding and revenues to their respective source, such as Ports revenues to the Harbor and Maintenance Trust Fund
- Inject funding through grant programs, low interest loans, and public private partnerships
- Adopt appropriate fees with periodic review for rate adjustments to access capital for improvements; for example, utility rates for water and wastewater services
- Develop new dedicated funding revenues for utilities, such as a stormwater drainage utility fee
- Invest in research and advancement of technology, such as artificial intelligence (AI), for efficiency and safety



POLICY AND REGULATIONS

Policies set regulations to establish requirements and standards that guide the development of infrastructure systems to ensure safety, efficiency, and reliability. Establishing clear standards ensures that infrastructure projects across all categories are technically sound, socially and environmentally responsible, and resilient. The framework of sound policy fosters design innovation, enhancing infrastructure systems' functionality and resilience. Furthermore, well-crafted policies and regulations can facilitate public-private partnerships, attracting investment and expertise from various sectors to accelerate infrastructure development. Such collaborations can lead to more efficient project delivery, better resource allocation, and innovative solutions to infrastructure challenges.

- Foster policies to deliver greater equity to underserved regions for infrastructure, such as broadband deployment and adoption
- Modify, remove, and develop new policies that enhance safety and remove risk, such as dam safety exemptions, updating hazardous clean-up regulations, and allowing solid waste projects to receive federal funding
- Adopt Safe Development Rules to mitigate the risk of high hazard infrastructure, such as development in inundation zones
- Make substantial improvements in the regulatory and permitting process to facilitate transparency and timely reviews
- Establish new state programs to manage existing assets, such as a Texas Levee Safety Program.



STANDARDS

Engineering design relies on standards to govern critical infrastructure systems, which are relied upon for safety, efficiency, and resilience. Advancements in technology, materials, and design methodologies are reshaping the infrastructure landscape and increasingly interconnecting these systems. Regularly reviewing and enhancing standards ensures efficiency and reliability. We must modernize standards across all counties to support a growing economy, lead innovation, and minimize risk and vulnerabilities to our infrastructure networks.

- Incorporating resilience in the design and maintenance of infrastructure systems to account for climate and environmental impacts such as sea level rise, increased heat, extended drought, and more intense rainfall
- Continue implementing technological advancements as requirements, such as NextGen systems for improving safe and efficient air traffic
- Adopt standards to reduce environmental impacts, such as nature-based or green infrastructure, pollution reduction, and decarbonization strategies, to enhance resiliency



ASSET MANAGEMENT AND PLANNING

A comprehensive understanding of existing assets across all infrastructure categories allows owners to plan, manage, optimize investments, and allocate resources effectively. The ability to assess condition and performance allows for prioritization of funding based on need and impact. The proactive approach to managing infrastructure also facilitates strategic planning and supports risk mitigation to extend asset life and service delivery.

- State and Local infrastructure agencies should develop repositories of existing assets, such as GIS database to assess condition
- Implement strategic planning to fund infrastructure through collaborative partnerships
- Continue utilizing non-destructive evaluation methods for efficient management and condition analysis
- Require infrastructure owners to maintain and inspect assets such as high hazard dams and hazardous waste
- Require emergency response plans or contingency plans to improve resiliency, such as hardening Energy infrastructure for reliability and storm response