

HAZARD MITIGATION ACTION PLAN

FOR

City of Texarkana, Texas

Five Year Update



DEVELOPED BY THE CITY OF TEXARKANA, TEXAS OFFICE OF EMERGENCY MANAGEMENT

and

ARK-TEX COUNCIL OF GOVERNMENTS

Adopted February 10, 2025

This Hazard Mitigation Plan (HMP) was developed by the City of Texarkana, Texas Hazard Mitigation Planning Team (HMPT) under the direction and guidance of the City of Texarkana, Texas Office of Emergency Management and Ark-Tex Council of Governments who worked with the Texas Division of Emergency Management (TDEM) to complete the HMP.

The primary contacts for the HMP update are:

City of Texarkana
Owen Jones
Fire Inspector
Texarkana Texas Fire Department
919 Elm Street
Texarkana, Texas 75501
owen.jones@txkusa.org
Office: 903-798-3496
Fax: 903-793-4731

Ark-Tex Council of Governments
Kathy McCollum
Hazard Mitigation/Environmental Specialist
4808 Elizabeth Street
Texarkana, Texas 75503
kmccollum@atcog.org
Office: 903-255-3576

Copies of the adopted Plan are available for review:

- City website: texarkanatexas.gov
- City of Texarkana, Texas Office of Emergency Management, 220 Texas Boulevard, Texarkana, Texas 75501
- City of Texarkana, Texas Library, 600 West Third Street, Texarkana, Texas 75501

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Executive Summary

We cannot control when or where a tornado or other natural hazard will strike, but we can increase the resiliency of the City of Texarkana, Texas residents, businesses, and visitors while saving lives and minimizing the negative effects of natural, technological, and human caused hazards through an effective and efficient hazard mitigation program. The City of Texarkana, Texas is dedicated to the protection of people, structures, infrastructure, economy, and unique ecosystems that contribute to our way of life and the sustainability of the local and regional economy.

Hazard Mitigation is any sustained action taken to reduce or eliminate the long-term risk to people and property from hazards and their effects. The key phrases in this definition, “sustained action” and “reduce or eliminate long-term risk,” make hazard mitigation different from other types of actions. Mitigation actions are typically permanent solutions that serve to reduce vulnerability and protect Texans from the effects of natural hazards. A hazard mitigation plan states the aspirations and specific courses of action that a community intends to follow to reduce vulnerability and exposure to future hazard events.

The intention of this Plan update is to serve as a blueprint for coordinating and implementing hazard mitigation policies, programs, and projects. It provides a list of mitigation goals, objectives, and related actions that may assist the City in reducing risk and preventing loss from future natural hazard events. The impacts of hazards can be lessened and sometimes avoided altogether if appropriate actions are taken before hazardous events occur. By avoiding unnecessary exposure to known hazard risks, communities will save lives and property and minimize the social, economic, and environmental disruptions that commonly follow hazard events. Through the identification of vulnerable areas and the implementation of measures aimed at minimizing exposure, the negative impacts of natural hazards may be reduced for the City of Texarkana.

Communities face significant challenges during post-disaster redevelopment in balancing the driving need for rapid recovery with implementing long-term hazard mitigation. The necessity to meet basic needs and resettle displaced populations immediately following a disaster often overshadows the more abstract, longer-term sustainability considerations. Once full-scale reconstruction is initiated, it is difficult to modify projects in progress to meet sustainability objectives. This trend highlights the need for pre-disaster mitigation planning that incorporates principles of sustainable development within the context of reconstruction, so that communities can more easily rebuild in a manner that will make them less vulnerable to future hazard events while improving the quality of life.

It is essential that local decision makers become and stay involved in this planning process to provide new ideas and insight for future updates to the Hazard Mitigation Plan for the City of Texarkana. It will remain a challenge and a goal for the City to provide necessary updates as mitigation techniques are implemented. It will remain imperative that all local agencies, units of government, nonprofit organizations, businesses and industries, and private citizens continue their involvement and dedication to hazard mitigation.

This update serves as the City’s hazard mitigation plan that represents a local commitment to reduce risks from natural hazards. The intent of this update is to produce a document that local officials can refer to in their day-to-day activities and in decisions regarding land use and planning decisions, regulation and ordinance creation and enforcement, granting permits, capital improvement investments, disaster

planning and other community initiatives. Additionally, the update to this hazard mitigation plan serves as the basis for FEMA and States to prioritize future grant funding as it becomes available.

The *2023 City of Texarkana, Texas Hazard Mitigation Plan Update* will continue to be a useful tool for all community stakeholders by increasing public awareness about local hazards and risks and by providing information about options and resources available to reduce those risks. Educating the public about potential hazards will help each jurisdiction protect itself against the effects of future hazards and will enable informed decision-making regarding where to live, purchase property, or locate business.

SUMMARY OF CONTENTS:

Section 1: Introduction provides the plan background and purpose.

Section 2: Community Profile provides demographic, geographic, and economic characteristics. This information sets the stage for defining the special characteristics useful in understanding the unique vulnerabilities within the City of Texarkana, Texas.

Section 3: Planning Process is a complete account of the planning committees and public meetings held during the planning process including individuals attending.

Section 4: Hazard Identification and Risk Assessment contains five areas of study: Risk Assessment, Hazard Identification, Vulnerability Assessment, Estimating Potential Losses, and Analyzing Development Trends. Historical data is used to identify and prioritize appropriate mitigation actions to reduce/eliminate losses from potential hazards.

Section 5: Capability Assessment describes the ability of the City to implement strategies and incorporate mitigation principles into other planning initiatives. The capabilities of private/public entities, state, and federal agencies are also provided.

Section 6: Mitigation Goals and Strategy includes the goals and objectives developed to provide a strong foundation for implementing hazard mitigation strategies. Individual Actions were identified by goal and objective and include a mitigation group and priority. An implementation process is also defined including how priorities were established. Funding Sources and Hazard Mitigation Assistance eligibility criteria are included.

Section 7: Plan Implementation and Maintenance presents the process the City of Texarkana, Texas Hazard Mitigation Committee and other identified departments will follow to ensure the Plan is integrated with all other planning documents, regulations, and ordinances and ensure the public is engaged in any and all updates. Procedures are also defined in evaluating the effectiveness of mitigation actions and the status of pending/in process projects.

Acronyms

ACS	American Community Survey
ATCOG	Ark-Tex Council of Governments
BRIC	Building Resilient Infrastructure and Communities Program
CDC	Centers for Disease Control and Prevention
DFIRM	Digital Flood Insurance Rate Map
DMA 2000	Disaster Mitigation Act of 2000
EJT	Extraterritorial Jurisdiction
EMC	Emergency Management Coordinator
EMS	Emergency Medical Services
EOC	Emergency Operations Center
EPA	Environmental Protection Agency
FEMA	Federal Management Agency
FMAG	Fire Management Assistance Grant Program
HMC	Hazard Mitigation Committee
HMP	Hazard Mitigation Plan
HMCPT	Hazard Mitigation Core Planning Team
HMGP	Hazard Mitigation Grant Program
HMPT	Hazard Mitigation Planning Team
IFR	Interim Final Rule
KBDI	Keetch-Byram Drought Index
LEISD	Liberty Eylau Independent School District
LPT	Local Planning Team
MWG	Mitigation Work Group
MSA	Metropolitan Statistical Area
NCEI	National Centers for Environmental Information
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
NRDC	Natural Resources Defense Council
NWS	National Weather Service
OEM	Office of Emergency Management
OWS	Outdoor Warning Siren
PA	Public Assistance
PDM	Pre-Disaster Mitigation Grant Program
PGISD	Pleasant Grove Independent School District
RPL	Repetitive Loss Properties
SHMP	State Hazard Mitigation Plan
SRLP	Severe Repetitive Loss Properties
SVI	Social Vulnerability Index
TDEM	Texas Division of Emergency Management
TFS	Texas A&M Forest Service
TISD	Texarkana Independent School District
TPW	Texas Parks & Wildlife Department
TWDB	Texas Water Development Board
TWU	Texarkana Water Utilities
TxDOT	Texas Department of Transportation
WUI	Wildland-Urban Interface

Section 1: Plan, Background and Purpose

Overview

The City of Texarkana, Texas Hazard Mitigation Plan (HMP) as written fulfills the requirements of the Disaster Mitigation Act of 2000 (DMA 2000), which is administered by the Federal Emergency Management Agency (FEMA). The Disaster Mitigation Act provides federal assistance to state and local emergency management entities to mitigate the effects of disasters. The HMP also encourages cooperation among various organizations across political subdivisions.

This HMP is an update of the City of Texarkana’s 2012 FEMA-approved HMP. With each update, new challenges are identified, new strategies proposed, and when incorporated, the updated plan grows in complexity, but not necessarily in utility. The City of Texarkana utilized general budget funds and city personnel and Ark-Tex Council of Governments personnel to update this Hazard Mitigation Plan (HMP).

This HMP is the result of two years of study, data collection, analysis, and community feedback. Representatives and citizens from the City of Texarkana, Texas had the chance to attend public meetings to discuss the hazards our community faces and the vulnerabilities those hazards present.

All participants involved in this plan understand the benefits of developing and implementing mitigation plans and strategies. Elected officials, public safety organizations, planners, and many others have worked together to develop and implement this HMP, displaying that they have the vision to implement mitigation practices to increase resiliency and help protect the citizens, property, environment and economy of the City of Texarkana, Texas from the effects of natural, technological, and human caused hazards.

Information for the plan was collected from **2011 to 2023**.

Authority

The Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), as amended by the Disaster Mitigation Act of 2000, provides the legal basis for state, tribal, and local governments to undertake risk-based approaches to reducing natural hazard risks through mitigation planning. Specifically, the Stafford Act requires state, tribal, and local governments to develop and adopt FEMA-approved hazard mitigation plans as a condition for receiving certain types of non-emergency disaster assistance. In Texas, federal regulatory authority for hazard mitigation planning resides with FEMA Region VI.

The Stafford Act authorizes the following grant programs:

- Hazard Mitigation Grant Program (HMGP), which helps communities implement hazard mitigation measures following a Presidential major disaster declaration. This program also funds development and update of hazard mitigation plans.
- Pre-Disaster Mitigation Grant Program (PDM), which awards planning and project grants to assist states, territories, federally recognized tribes, and local communities in implementing sustained pre-disaster natural hazard mitigation programs. Such efforts may include development or update of hazard mitigation plans.

- Building Resilient Infrastructure and Communities Program (BRIC), will support states, local communities, tribes, and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards.
- Public Assistance Grant Program (PA), which provides assistance to state, tribal, and local governments, and certain types of private nonprofit organizations so that communities can quickly respond to and recover from major disasters or emergencies declared by the President.
- Fire Management Assistance Grant Program (FMAG), which provides assistance to state, tribal, and local governments for the mitigation, management, and control of fires on publicly or privately-owned forests or grasslands that threaten such destruction as would constitute a major disaster.

Title 44, Chapter 1, Part 201 (44 CFR Part 201) of the Code of Federal Regulations (CFR) contains requirements and procedures to implement the hazard mitigation planning provisions of the Stafford Act.

The purpose of the Stafford Act, as amended by the Disaster Mitigation Act of 2000, is “to reduce the loss of life and property, human suffering, economic disruption, and disaster assistance costs resulting from natural disasters.” Chapter 322 of the act specifically addresses mitigation planning and requires state and local governments to prepare multi-hazard mitigation plans as a precondition for receiving FEMA mitigation grants.

This City of Texarkana, Texas Hazard Mitigation Plan was developed by the City of Texarkana, Texas Hazard Mitigation Planning Team (HMPT) under the direction and guidance of the City of Texarkana, Texas Office of Emergency Management and Ark-Tex Council of Governments. The plan represents collective efforts of citizens, elected and appointed government officials, business leaders, non-profit organizations, and other stakeholders. This plan, and updating the plan, and timely future updates of this plan, will allow the City of Texarkana, Texas to comply with the Disaster Mitigation Act of 2000 and its implementation regulations, 44 CFR Part 201.6, thus resulting in eligibility to apply for federal aid for technical assistance and post-disaster hazard mitigation project funding. The update will also prioritize potential risks and vulnerabilities in an effort to minimize the effects of disasters in the community.

Scope

The planning area for this plan is the City of Texarkana, Texas (marked in red on the Texas map). This HMP identifies natural hazards that could threaten life and property in the community. The scope of this plan includes both short and long-term mitigation strategies, implementation, and possible sources of project funding to mitigate identified hazards.



Purpose

The City of Texarkana, Texas is susceptible to a number of different natural hazards that have potential to cause property loss, loss of life, economic hardship, and threats to public health and safety. The occurrence of natural disasters cannot be prevented; however, their impact on people and property can be lessened through hazard mitigation measures.

According to the National Institute of Building Sciences 2017 Interim Report, “Natural Hazard Mitigation Saves” mitigation efforts can save the nation \$6 in future disaster costs for every \$1 spent. Promoting proven cost-effective mitigation efforts will increase the protection of the citizens of Texarkana’s health, safety, and welfare.

Mitigation planning is imperative to lessen the impact of disasters in The City of Texarkana, Texas. This plan is an excellent method by which to organize the City of Texarkana’s mitigation strategies. The implementation of the plan and its components is vital to preparing a community that is resilient to the effects of a disaster. The implementation of this HMP can reduce loss of life and property and allow our community to operate with minimal disruption of vital services to citizens. This HMP provides a risk assessment of the hazards the City of Texarkana, Texas is exposed to and puts forth several mitigation goals and objectives that are based on that risk assessment.

According to FEMA, an essential characteristic of sustainable communities is resilience to disasters. A disaster-resilient community is one in which significant steps and actions have been taken to reduce the community's vulnerability to potential hazard events. When an event does occur, the rewards of these steps and actions include:

- Saved lives.
- Reduced damage to property.
- Reduced economic losses.
- Minimized social disruption.
- Ability of local government to resume operations quickly.
- Shorter recovery period for the community.
- Improved attractiveness to individuals and businesses by demonstrating effectiveness in dealing with a disaster.

Communities pursue disaster resilience through one or all of the following:

- Reducing risk to future development through location (planning), better codes, and implementation and enforcement of codes.
- Taking steps to protect existing development.
- Preparing people, property, critical infrastructure, and the economy to withstand and rebound from the impacts of disasters.

Consistency with Federal and State Mitigation Policies

This HMP is intended to enhance and complement federal and state recommendations for the mitigation of natural and technological hazards in the following ways:

- Substantially reduce the risk of loss of life, injuries, and hardship from the destruction of natural and technological disasters.
- Improve public awareness of the need for individual preparedness and building safer, more disaster resilient communities.
- Develop strategies for long-term community sustainability during community disasters.
- Develop governmental and business continuity plans that will continue essential private sector and governmental operations during disasters.

FEMA publishes many guidance documents for local governments for mitigating natural disasters. The City of Texarkana, Texas HMP fully recognizes, adopts, incorporates, and endorses the following principles:

- Develop a strategic mitigation plan for the City of Texarkana.
- Enforce current building codes.
- Develop incentives to promote mitigation.
- Incorporate mitigation of natural hazards into land use plans.
- Promote awareness of mitigation opportunities and programs throughout our community on a continual basis.
- Identify potential funding sources for mitigation projects.

The private sector is often an overlooked segment of the community during disasters. It is vital that this sector of a community is included in mitigation efforts that are consistent with state and federal recommendations such as the following:

- Develop mitigation incentives with insurance agencies and lending institutions.
- Encourage the creation of a business continuity plan for the continuance of commerce during disasters.
- Partner with businesses in an effort to communicate with customers about the hazards in our community and possible solutions.

Individual citizens must be made aware of the hazards they face. Additionally, they must be educated in how to protect themselves from these hazards. They must be shown that mitigation is an important part of reducing loss of life and property in their community. Their support is critical to the success of any mitigation effort. The City of Texarkana HMP supports the following FEMA recommendations regarding individual citizens:

- Become educated on the hazards that you and your community face.
- Become part of the process by supporting and encouraging mitigation programs that reduce vulnerability to disasters.
- Take individual responsibility for safeguarding yourself and your family prior to a disaster.

Priorities

The 2023 review of the HMP: analyze and revise to reflect changes in priorities and progress towards reaching Mitigation Actions.

Adoption

The HMP will be a municipal plan, will meet state planning standards for mitigation, and will be formally adopted by resolution after approval by FEMA.

Vision, Objectives and Plan Goal

Hazard Mitigation Mission Statement

To increase the resiliency of the City of Texarkana, Texas residents, businesses, and visitors while minimizing the negative effects of natural, technological, and human caused hazards through an effective and efficient hazard mitigation program. Our combined prioritization is the protection of people, structures, infrastructure, economy, and unique ecosystems that contribute to our way of life and the sustainability of the local and regional economy.

Hazard Mitigation Vision Statement

Institutionalize and promote a city-wide hazard mitigation ethic through leadership, professionalism, and excellence, leading the way to a safe, sustainable City.

Mission, Vision and Core Values

The City of Texarkana HMP Mission and Vision Statements align with the City's Mission, Vision and Core Values, which were approved on December 13, 2021, by the City Council.

MISSION, VISION & CORE VALUES

VISION
The vision of the City of Texarkana, Texas is to be a thriving regional center for education, business and culture which attracts and serves our residents and visitors.

MISSION
The mission of the City of Texarkana, Texas is to provide customer focused public services and regional leadership that serves our residents and visitors while offering a safe, vibrant, and welcoming community.

CITY OF TEXARKANA
1873

TEAMWORK **INTEGRITY** **ACCOUNTABILITY** **INNOVATION**
LEADERSHIP **PROFESSIONALISM** **COMMUNICATION** **CHARACTER**

Section 2: Community Profile

Background

Prior to addressing the hazards that our community faces, this Plan presents a brief overview of the City of Texarkana, Texas taking into account the demography, geography, history, climate, transportation, community assets population and growth and economic characteristics.

History

Texarkana, Texas was first settled in 1874 at the junction of two railroads – the Texas & Pacific and the Cairo & Fulton rail lines. The community’s sister city, Texarkana, Arkansas, was incorporated a few years later in 1880. The two cities are integrated economically and culturally despite being in separate states with separate governing structures.

Major industries in the early 1900s were associated with the railroad and agricultural processing. The Texarkana region as a whole grew substantially in the 1940s with the construction of the Red River Army Depot just west of Texarkana. The Army Depot is still active today and provides maintenance support for the army.

As more infrastructure was built, Texarkana became a major commercial and industrial hub in the southwest. Today, major industries in the region include agriculture, lumber products, and retail trade. Given its location, Texarkana serves as a hub for freight moving into and out of Texas. Interstate 30 runs through Texarkana and connects to Dallas-Fort Worth to the southwest and Little Rock to the northeast. The major rail lines in the city connect to Dallas-Fort Worth and point east. Union Station in downtown still serves as a stop along the Texas Eagle Amtrak route. Texarkana also serves as an important educational center; within the city there is one university, Texas A&M University – Texarkana, and one college, Texarkana College. Some of the most well-known cultural sites in Texarkana are the Perot Theatre which first opened in 1924, the famous ragtime artist Scott Joplin mural, and the Rose Hill Cemetery that was founded in 1874 and features graves of both Union and Confederate soldiers.

The two cities are still intrinsically linked. Commonly referred to as ‘Texarkana USA,’ there are several organizations that serve both cities such as the Chamber of Commerce and Main Street Texarkana. State Line Avenue serves as the physical barrier between the two cities, counties, and states, and presents redevelopment opportunities to make the roadway a signature gateway through the two cities. The only bi-state justice building in the country is on State Line Avenue in downtown and serves as the office for both Texas and Arkansas officials. One of the most unique features of State Line Avenue is the only U.S. Post Office sitting in two states. The Post Office has two zip codes, 71854 for Texarkana, Arkansas and 75501 for Texarkana, Texas.



Data Source: Texarkana 2018 Comprehensive Plan

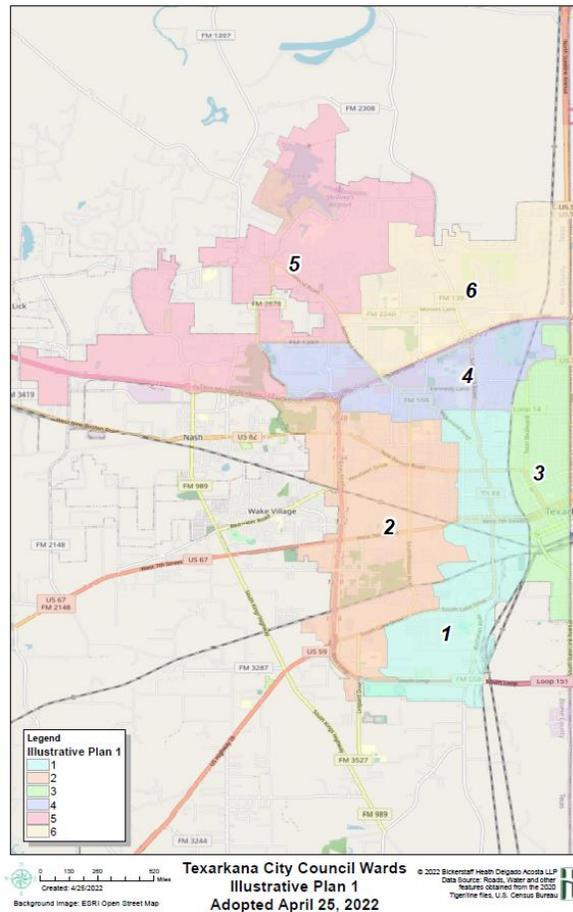
City of Texarkana Government Organization

The City of Texarkana, Texas is a home rule city which has operated under “Council-Manager Form of Government” since 1960. The council is the legislative body; members are the community’s decision makers. One council member is elected from each of six wards, and the mayor is elected at large forming the City Council. A review of the 2020 Census data revealed that a population imbalance existed in three of the wards within Texarkana, Texas, resulting in redistricting. The City Council unanimously approved a new ward map on April 25, 2022, that sets the city’s political parameters for the coming decade.

Power is centralized in the elected council, which approves the budget and determines the tax rate, for example. The council also focuses on the community’s goals, major projects, and such long-term considerations as community growth, land use development, capital improvement plans, capital financing, and strategic planning. The council hires a professional city manager to carry out the administrative responsibilities and supervises the manager’s performance.

The City Manager is hired to serve the council and the community and to bring to the local government the benefits of training and experience in administering local government projects and programs on behalf of the governing body. The manager prepares a budget for the council’s consideration; recruits, hires, and supervises the government’s staff; serves as the council’s chief adviser; and carries out the council’s policies. Council members and citizens count on the manager to provide complete and objective information, pros and cons of alternatives, and long-term consequences.

Ward Map for the City of Texarkana



Map Source: David Orr email



Picture Source: TXKToday

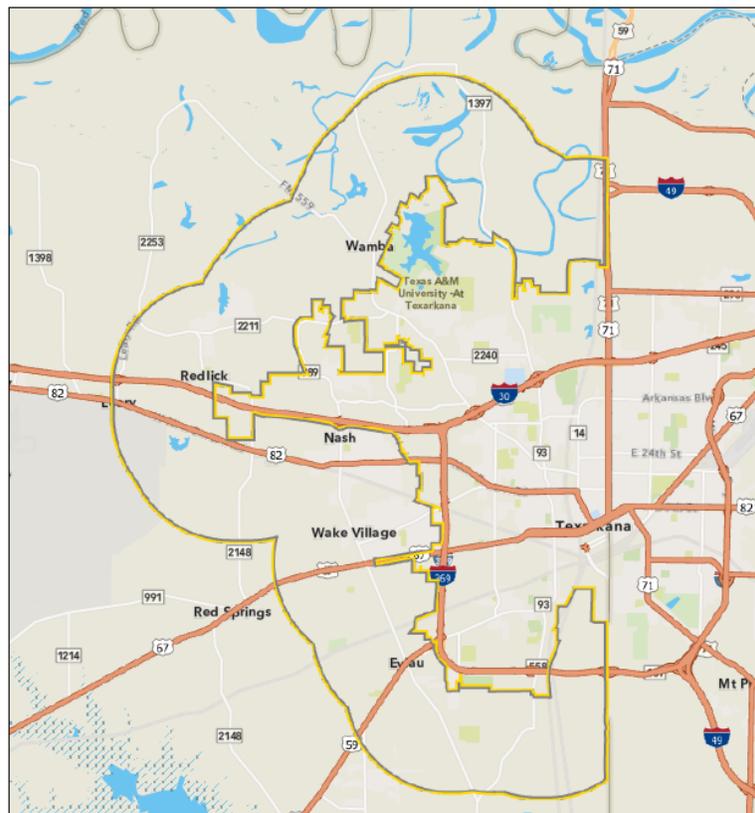
The City provides a full range of services, including police, fire, streets and infrastructure, traffic engineering, parks, recreation, library, community development (planning and zoning), public improvements, tourism activities, and general administrative services. Water and sewer distribution and collection activities are provided by Texarkana, Texas water department in conjunction with the Texarkana, Arkansas water department, dba Texarkana Water Utilities (TWU).

Source: 2019 Texarkana Source: 2019 Comprehensive Annual Financial Report

Location and Size

The City of Texarkana, Texas is located in the eastern portion of Bowie County in the northeast corner of Texas, close to Louisiana and Oklahoma, and bordering Arkansas. The City went from 29.04 square miles to approximately 31.37 square miles due to the annexation of approximately 2.5 square miles since 2010. Population per square mile in 2020 is 1,153.7 as compared to the population per square mile in 2010 was 1,253.8. Additionally, the Extraterritorial Jurisdiction (ETJ) of Texarkana extends two miles beyond the city limits and could be incorporated in the future.

City of Texarkana and Extraterritorial Jurisdiction



6/17/2022, 2:07:41 PM

- TxkTxETJ
- Streets
- Freeway
- Highway
- Ramp

1:144,448
0 1 2 4 mi
0 1.5 3 6 km

TWU, Arkansas GIS Office, Texas Parks & Wildlife, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METINABA, USGS, EPA, NPS, USDA

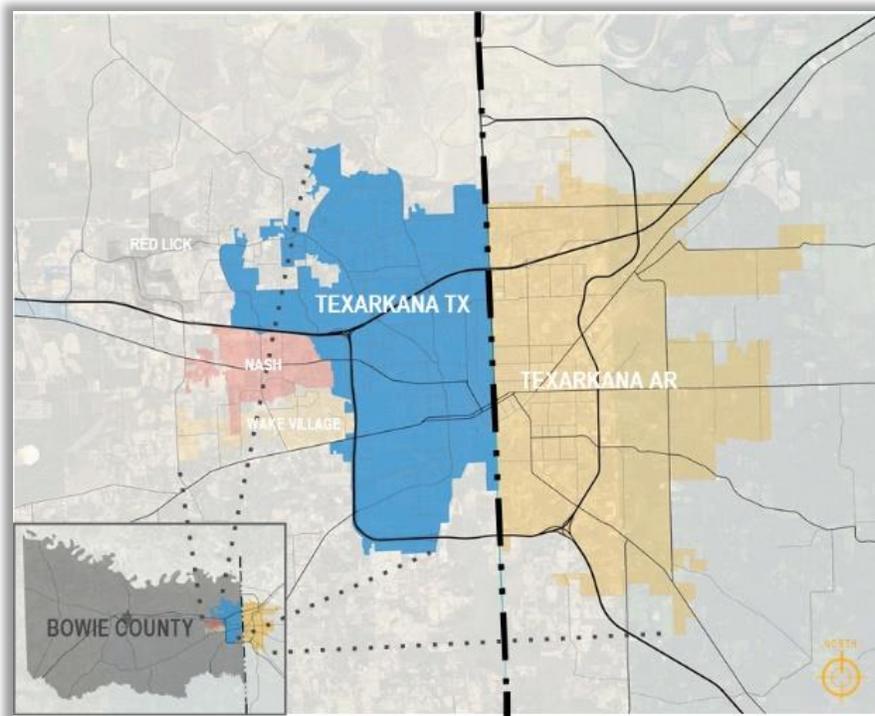
Disclaimer: Texarkana Water Utilities (TWU) maps are for display purposes only. TWU makes no guarantees, or warranties as to the accuracy, completeness, currency, or suitability of the information

Map Source: txk.maps.arcgis.com

Geography

Texarkana is located at the junction of Interstate 30, 49, and future I-69 (currently I-369) and US highways 59, 67, 71, and 82 on the Texas-Arkansas border. State Line Avenue, the town's main street, divides the City of Texarkana, Texas and the City of Texarkana, Arkansas. Texarkana is a hub of regional interstate commerce located 179 miles east of Dallas and 145 miles southwest of Little Rock. Texarkana was established as a railroad and industrial center and has grown into a regional agriculture, retail, and wholesale service center.

The City of Texarkana is the largest City in Bowie County. The City is part of the Texarkana Metropolitan Statistical Area (MSA), which is a three-county region comprising the twin cities of Texarkana, Texas and Texarkana, Arkansas, and encompassing the surrounding communities of Bowie County, Texas, Little River County, Arkansas and Miller County, Arkansas. The US Census Bureau defines an MSA as an area with a "...large population nucleus, together with adjacent communities that have a high degree of economic and social integration with that nucleus." The City of Texarkana, Texas serves as the nucleus for the MSA and provides a number of goods and services for the region. As of the population census, April 1, 2020, the population of Texarkana, Texas is 36,193 and the greater Texarkana Metropolitan Area is 149,482.

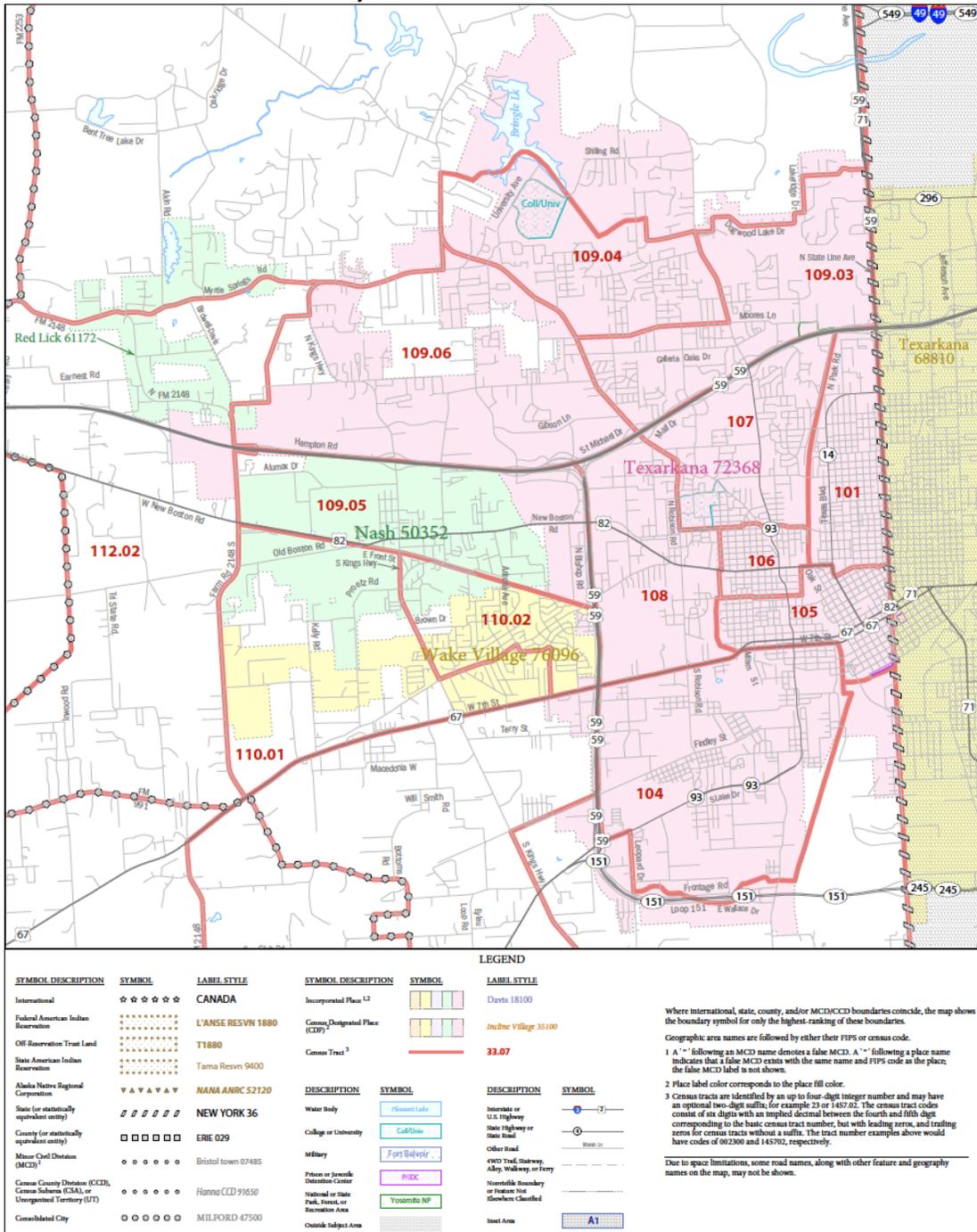


Map & Data Source: *Texarkana 2018 Comprehensive Plan*

Source: <https://censusreporter.org/profiles/31000US45500-texarkana-tx-ar-metro-area/>

City of Texarkana, Texas Census Tracts

City of Texarkana Census Tracts



(Census Tract numbers for City include: 109.06, 109.04, 109.03, 108, 107, 106, 105, 104, 101)

Source: <https://www.census.gov/geographies/reference-maps/2020/geo/2020pl-maps/2020-census-tract.html>

Source: <https://experience.arcgis.com/experience/13a111e06ad242fba0fb62f25199c7dd/page/Page-1/>

Climate

The climate of Texarkana is transitional between the subtropical humid-type prevalent in the South and the continental climates of the Great Plains and Midwest to the north. During winter, masses of moderate to severely cold air move periodically through the area. The spring and fall seasons are usually mild, while the summer months are consistently hot and humid, with high pressure and a moist southerly flow being the dominant features. Rainfall is abundant with the normal annual rain just around 49 inches, with monthly averages ranging from less than 3 inches in August to more than 5 inches in May and June. The average growing season for this area ranges between 220 and 230 days in length.

Most of the rainfall is convective in nature and air mass types-showers and brief-except during winter when nearly continuous frontal rains may persist for a few days. Extremes of precipitation occur in all seasons. While torrential rainfall is the exception in the Texarkana area, some heavy rainfall events of note are 10.48 inches on May 28, 1998, and 11.71 inches over a 3-day period on May 26-28, 1998. The October 1919 total of 18.28 inches is the greatest monthly total. The greatest annual rainfall total of record was in 2009 with 78.08 inches, and the driest year on record was 1899 with 7.62 inches.

The winter months are normally mild, with cold spells generally of short duration. The typical pattern is to turn cold one day, reaching the lowest temperature on the second day, and a warming trend on the third day. The coldest temperature on record at Texarkana is -9 degrees F on February 13, 1899. Temperatures drop below 15 degrees F only about one out of every two winters. The average date of the freeze (32 degrees F or lower) in the fall is November 15, and the average date of the last freeze in the spring is March 10. Temperatures recorded at the National Weather Service office on clear, calm nights are normally two to five degrees warmer than those in the low-lying river bottom lands of the area. Measurable snowfall amounts occur on an average of only once every other year; many consecutive years may pass with no measurable snowfall. The heaviest snowstorm of record in the Texarkana area is 14.0 inches in February of 2021. This fell on the 15th, 17th, and 18th. In 2021, 16.0 inches of snow was measured for the month of February for the greatest monthly amount on record. Occasional ice and sleet storms do considerable damage to trees, power, and telephone lines, as well as make travel very difficult.

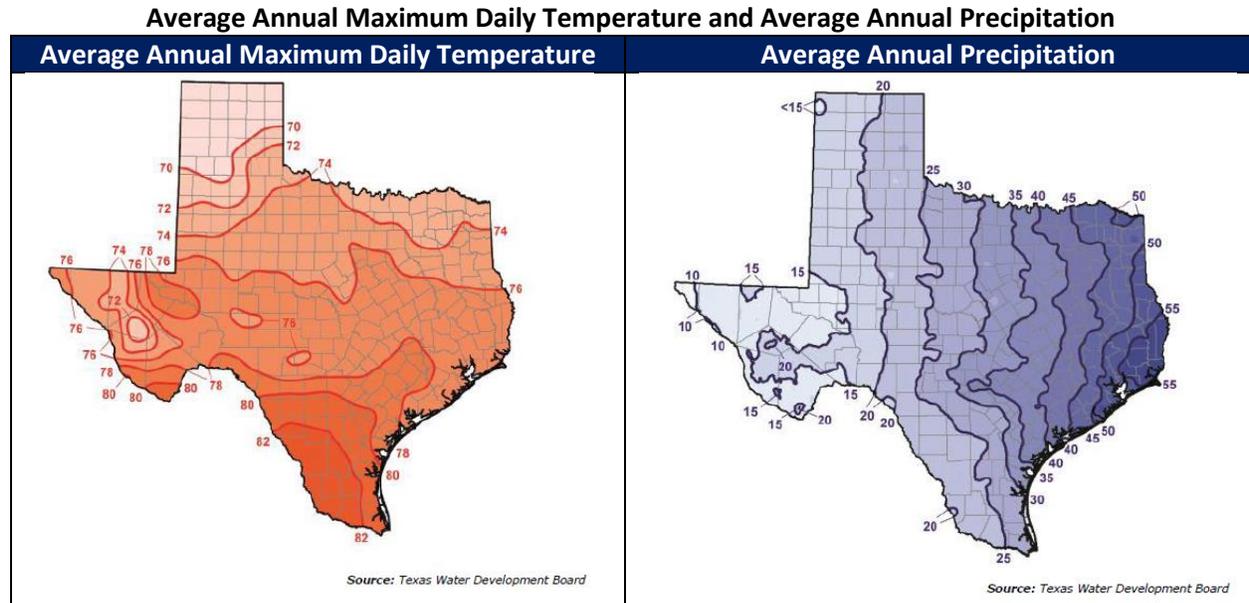
The summer months are consistently quite warm, with maximum temperatures exceeding 100 degrees F about 6 days per year, exceeding 95 degrees F about 32 days per year, and exceeding 90 degrees F about 87 days per year. The highest temperature on record is 117 degrees F on August 10, 1936. Showers and thunderstorms at any one location in the area give about eight days in a month of measurable rainfall. The resulting point rainfall totals are usually less than one-half inch except on two or three days per month when heavier amounts are recorded.

Thunderstorms occur each month but are most frequent in spring and summer months. The showers and thunderstorms during the spring and autumn months are most often produced by squall lines and fronts, and are generally heavier than the air mass showers, which occur in the summer months. Severe local storms, including hailstorms, tornadoes, and local windstorms have occurred over small areas in all seasons, but are most frequent during the spring months, with a secondary peak from November to early January. Large hail of a damaging nature is infrequent, although large hail greater than softball size can occur.

The average relative humidity is rather high in all seasons. These high humidity values may be experienced at any hour, but occur mainly during the early morning hours, with two-thirds of the hours shortly before sunrise having relative humidity of 90% or higher. In contrast, more than half of the mid-afternoon hours

have had relative humidity values of less than 50%. Tropical cyclones are in the dissipating stages by the time they reach the Texarkana area, and winds from them are usually not a destructive factor. Rainfall accompanying these systems can be heavy and can contribute to local flooding.

Data Source: NWS-Shreveport, Meteorologist Charlie Woodrum 2022



Population and Demographics

Texarkana experienced the greatest increase in population from 1940 to 1960, which coincides with population patterns across the country at that time. Since 1960, the population of Texarkana has remained steady, adding only 6,193 people in the last 50 years, or an average of 1,200 people per decade. According to the 2010 decennial Census, the population of people in Texarkana, Texas was 36,411 people. The April 1, 2020, Census population estimate for Texarkana, Texas was 36,193 people, a .6% decrease over 2010. There are estimated to be 14,032 households in the City with an average household size of 2.47.

The population from 2010 to 2020 shows Bowie County’s population estimate for 2020 was 92,802. The City’s population makes up 39% of the entire population of Bowie County and 24% of the Texarkana Metropolitan Statistical Area (MSA), which has the population of 149,482 as of April 1, 2020.

Data Source: Texarkana 2018 Comprehensive Plan, US Census Quick Facts for 2020 data update

Data Source: <https://www.census.gov/quickfacts/fact/table/texarkanacitytexas/PST045221#qf-headnote-a>

Data Source: <https://www.census.gov/quickfacts/fact/dashboard/texarkanacitytexas,TX/PST045221>

A further breakdown of the population of Texarkana as collected by the US Census is compiled in the following tables.

Texarkana Demographic Data (FIPS Code 4872368)

Topic – Estimates July 1, 2021	City of Texarkana, TX	State of Texas
Age and Sex		
Persons under 5 years (%)	7.4%	6.9%
Persons under 18 years (%)	24.90%	25.50%
Persons 65 years and over (%)	16.5%	12.9%
Female persons (%)	52.70%	50.30%
Health		
With a disability, under age 65 (%) (2016-2020)	9.2%	7.9%
Disabled Population in Texarkana (2020 ACS)	11.7%	11.5%
Persons without health insurance, under age 65 (%)	14.8%	20.8%
Population Characteristics		
Language other than English spoken at home (%) (2016-2020)	7.0%	35.1%
Foreign born persons, percent, 2016-2020	4.60%	16.80%
Veterans, 2016-2020	2,629	1,435,527
Education		
High school graduate or higher, percent of persons age 25 years+, 2016-2020	89.30%	84.40%
Bachelor’s degree or higher, percent of persons age 25 years+, 2016-2020	24.90%	30.70%
Economy		
In civilian labor force, total, percent of population age 16 years+, 2016-2020	55.10%	64.40%
In civilian labor force, female, percent of population age 16 years+, 2016-2020	53.30%	58.20%
Income and Poverty		
Persons in poverty (%)	21.9%	14.2%
Median household income (in 2020 dollars), 2016-2020	\$46,408	\$63,826
Housing		
Total housing units (2020 Decennial Census)	16,270	11,589,324
Median housing value (2016-2020)	\$143,300	\$187,200
Median Rent, 2016-2020	\$797	\$1,082
Computer and Internet Use		
Households with a computer, percent, 2016-2020	79.80%	92.70%
Percent of households with a broadband Internet subscription (2016-2020)	70.7%	85.1%
Transportation		
Mean travel time to work (minutes), worker age 16+, 2016-2020	15.9	

Data Source: <https://www.census.gov/quickfacts/fact/table/texarkanacitytexas,TX,US/PST045221>

Population by Race and Ethnicity Trends: City of Texarkana, Texas

Population by Race and Ethnicity Trends: City of Texarkana, Texas					
Year:	1990	2000	2010	2015	2020
Total Population:	31,656	34,782	36,411	37,088	36,193
% White	63.0%	59.2 %	55.4%	55.7%	51.8%
% Black	35.9%	37.1%	37.2%	37.1%	39.8%
% Asian	1.12%*	0.7%	1.4%	0.4%	2.2%
% American Indian	0.4%	0.3%	0.5%	1.6%	0.4%
% Pacific Islander	1.12%*	0.1%	0.03%	0%	0.0%
% Other	0.32%	1.4%	3.4%	2.1%	2.2%
% Multiple Races	N/A	1.2%	2.2%	3.2%	3.6%
% Hispanic/Latino	1.1%	2.9%	6.4%	7.3%	7.9%
Total Minority	37.7%	40.8%	46.9%	48%	

**In 1990, Asian and Pacific Islander were combined for reporting purposes*

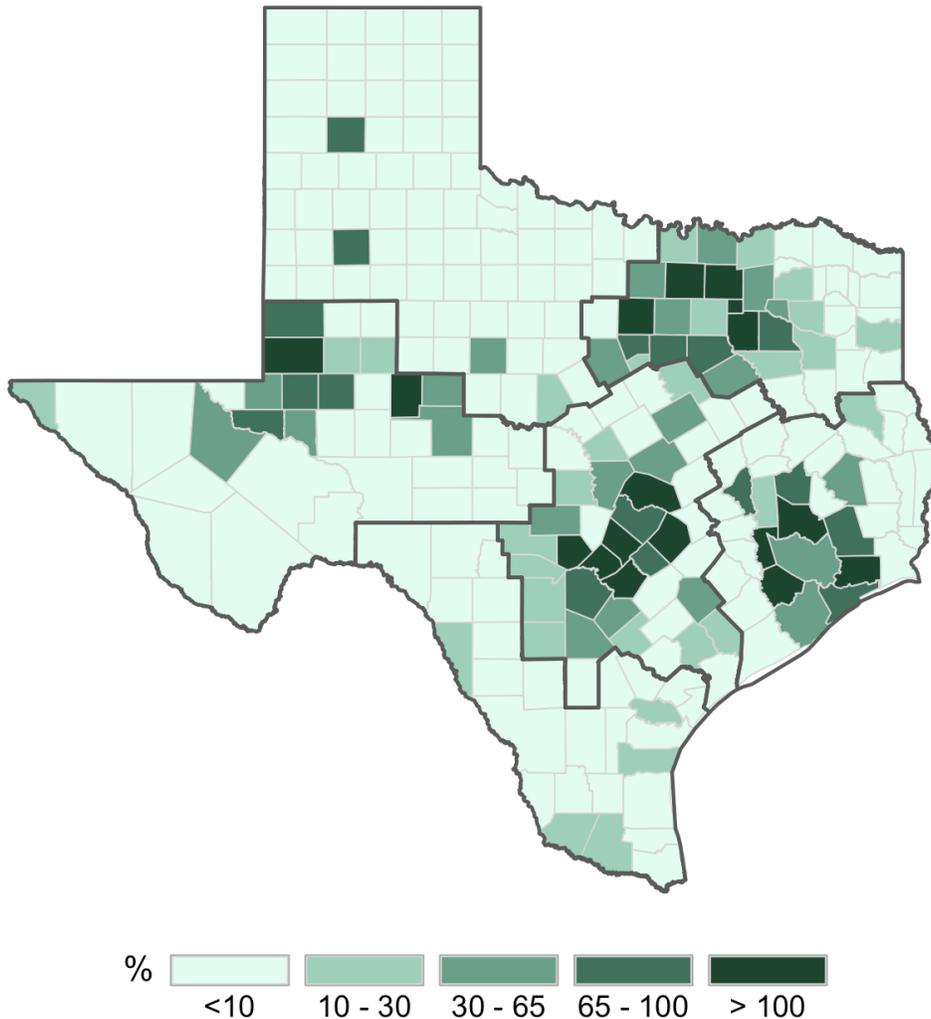
Data Source: Texarkana 2018 Comprehensive Plan, 2015 ACS, U.S. Decennial Census, and NHGIS Data Finder

Growth Projections

In the next five years, the population in Texarkana, Texas is projected to grow 0.45% and the overall Metropolitan Statistical Area (MSA) 0.24%. In the longer-term future, the city is projected to grow a bit more rapidly. According to the Texarkana MPO, the population of Texarkana is expected to increase 11% from 36,411 people in 2010 to 40,592 people in 2040. Additionally, according to the Texas Water Development Board (TWDB), Texarkana, Texas is projected to grow 5% from 2015 to 2040. This growth is less than what is expected for the State of Texas as a whole, but the growth of Texas should have an impact on Texarkana growth. The population of Texas is projected to increase approximately 50% from 2020-2060.

Data Source: Texarkana 2018 Comprehensive Plan

Projected Population Increase (2020-2060) by County



Source: Texas Demographic Center Population Projections Program
<https://demographics.texas.gov/Data/TPEPP/Projections>

Source: 2023 SHMP

According to the 2023 SHMP, Texas is the second largest state in terms of population, but its recent population growth has exceeded all other states. From 2010-2020, the Texas population increased by 15.9%.

Residential Mobility

Americans change residences frequently and mobility rates are higher among low-income households, renters, and younger families. Households sometimes move to improve their housing situations or their neighborhood surroundings. Low-income households, however, may make frequent moves because of economic or social distress. Residential mobility not only affects individual households, but it may also affect neighborhoods. Place-based initiatives that attempt to improve outcomes for individuals and strengthen neighborhoods face challenges in such dynamic and fluid environments.

Data Source: www.huduser.gov

Residential Mobility Data for the City of Texarkana, Texas

Residential Mobility in the Last Year	
Moved within the Same County	4.6%
Moved from a Different County, Same State	2.0%
Moved from a Different State	2.1%
Moved from Abroad	0.3%

Data Source: 2020 American Community Survey.

Texarkana, Texas Household Characteristics Trends

Texarkana, Texas Household Characteristics Trends				
Year:	2000	2010	2015	2020
Total Housing Units	15,105	16,115	16,280	16,270
% Occupied	89.8%	89.5%	83.9%	88.5%
% Owner Occupied, 2016-2020	58.7%	51.2%	55.1%	52.3%
% Renter Occupied	41.3%	48.8%	44.9%	47.7%
% Vacant	10.2%	10.5%	16.1%	14.7%
Average Household Size, 2016-2020	2.42	2.41	2.63	2.48
Single-Person Home	29.9%	32.4%	30.3%	
Median Home Value, 2016-2020	\$65,800	\$95,600*	\$106,400	\$143,300
Median Rent, 2016-2020	\$377	\$488*	\$567	\$797
Median Household Income, in 2020	\$30,152	\$39,319*	\$39,113	\$46,408

Data Source: American Community Survey, U.S. Decennial Census and NHGIS Data Finder.

*2006-2020 American Community Survey 5-Year Estimates

Housing Stock: The majority (70%) of housing units in Texarkana are single-family, either attached or detached. Additionally, 25% are multifamily units, 3% are duplexes, and 3% are mobile homes, boats, or other. The percentage of multi-family units has increased since 2000, while the percentage of single-family units has decreased slightly. Age of housing stock is also an important factor to consider. 33% of housing units were built from 1960 to 1979, 28.7% built between 1980 and 1999, 18.8% built since 2000, 12.2% built between 1940 and 1959, and 7.2% built before 1939. This indicates that the housing stock is aging and needs to be revitalized since 52.4% of the existing stock was built prior to 1980.

Texarkana, Texas Housing Stock

Age of Housing Stock by Housing Unit Type						
	Housing Units (Total)	1939 or earlier	1940-1959	1960-1979	1980-1999	Since 2000
All Housing Types	16,591	1,195 7.2%	2,024 12.2%	5,475 33%	4,762 28.7%	3,132 18.9%
Single Family (attached & detached)	9,708	6%	22%	41%	22%	10%
Duplex/Triplex/Quadraplex	1,359	4%	9%	19%	40%	28%
Multifamily	2,462	6%	4%	20%	33%	37%
Other	402	0%	4%	12%	58%	27%

Data Source: *Texarkana 2018 Comprehensive Plan, 2016-2020 American Community Survey (ACS) Five-Year Estimates*

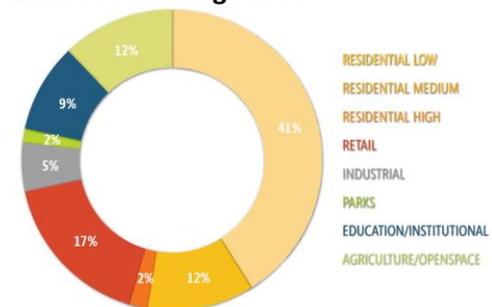
Cost of Housing: From 2000 to 2020, median home values in Texarkana rose 46% from \$65,800 to \$143,300. Median rent also increased 47% in that timeframe, from \$377 to \$797. During this same time, median household income increased 65% from \$30,152 to \$46,408 today. While housing cost is likely one of the most important factors when deciding where to live, the cost of transportation can also play a large role in one’s overall cost of living. The Center for Neighborhood Technology created a ‘Housing and Transportation Affordability Index’ to determine a more accurate cost of living for various geographies throughout the United States. In Texarkana, average housing costs make up 27% of one’s income and transportation costs account for 28% of one’s income. This is a total of 55% of one’s income that residents in Texarkana spend on average for housing and transportation costs. While this is very high, residents in peer cities spend a similar percentage of their income on housing and transportation on average, including: Texarkana, AR (55%); Longview (54%); Tyler (56%); Marshall (55%); and Sulphur Springs (54%).

Land Use/Built Environment

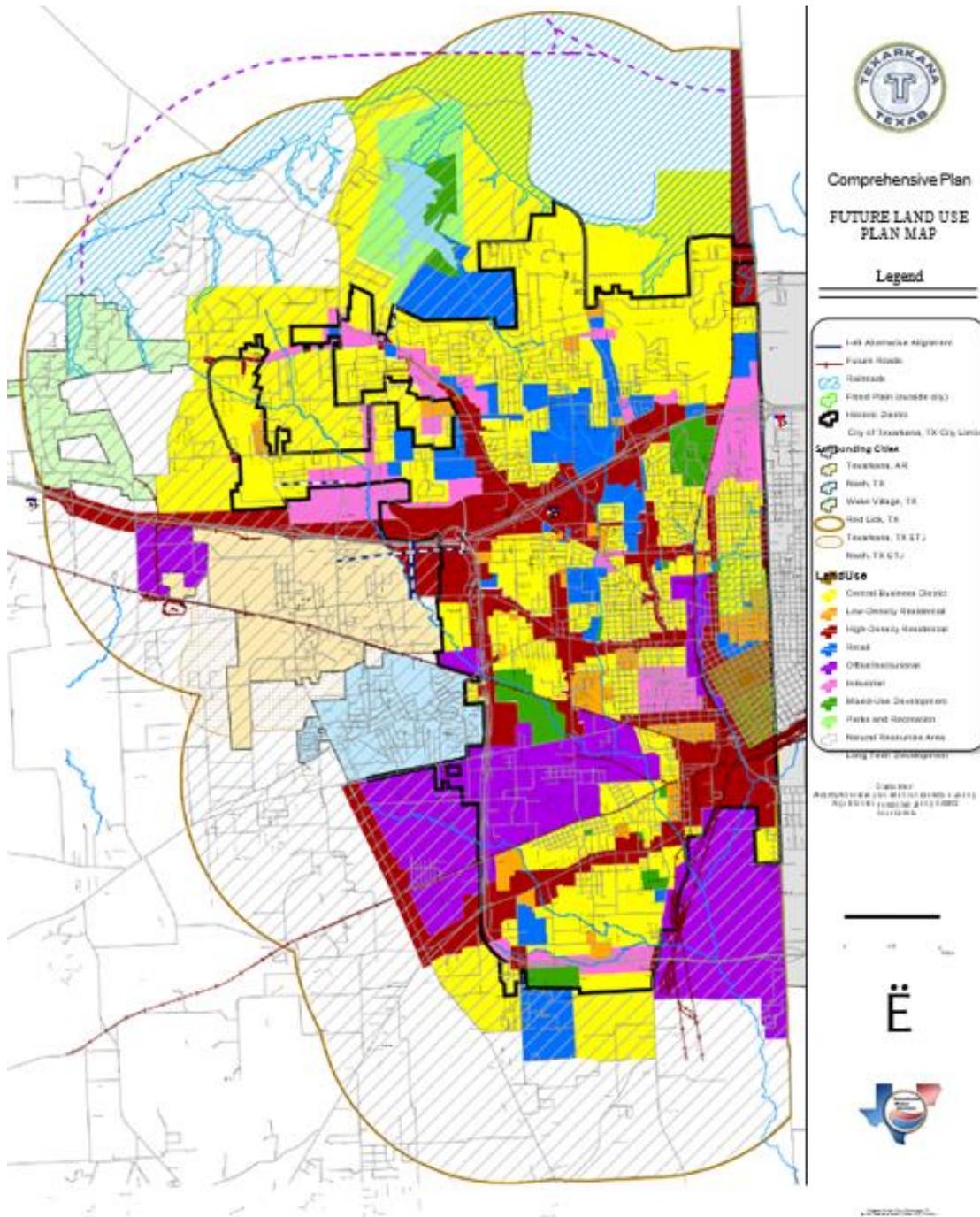
According to the Texarkana 2018 Comprehensive Plan, approximately 88% of the current Texarkana city limits is developed; and 12% is designated as agriculture or open space.

Residential uses make up 55% of the total land area, with the majority being low-density housing. Retail use is the next largest category, making up just under 20%, followed by education and institutional uses which make up just under 10%. There are also industrial uses, making up about 5% and parkland makes up just 2% of land in the city limits. Although the city has a mixed-use zoning category, there is currently no data about how much land is covered by mixed-use development.

Land Use Coverage Area



Future Land Use Plan Map



Data Source: *Texarkana 2018 Comprehensive Plan*

Building Permits

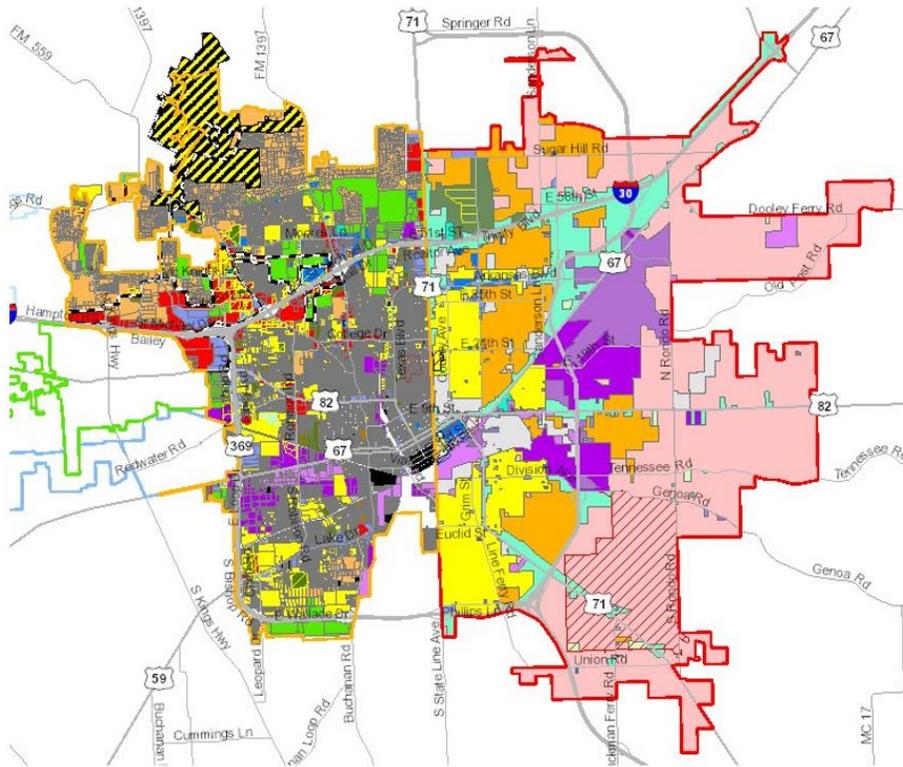
The City continued to see growth in residential and commercial construction in fiscal year 2022. The City issued 152 permits for residential new constructions, 216 permits for new non-residential or commercial construction, 239 permits for building re-models, and 1,159 permits for certificates of occupancy.

Source: 2022 Texarkana Comprehensive Annual Financial Report

Existing Regulatory Framework

Zoning in Texarkana is governed by Chapter 140 of the city's code of ordinances. There are currently 22 zoning districts in the city, including eight residential districts and three planned development districts. The code goes into detail about what land uses are allowed in each district, as well as height, size, density, and other standards. The City Council makes decisions about development requests with advice from the Planning and Zoning Commission. The Zoning Board of Adjustment hears requests about variances.

Existing Zoning in Texarkana



Zoning Districts:

A: Agricultural District

SF-1: Single-Family Dwelling District-1

SF-2: Single-Family Dwelling District-2

SF-3: Single-Family Dwelling District -3

PUR: Planned Unit Residential District

2F1: Two-Family Dwelling District-1

2F-2: Two-Family Dwelling District-2

TH: Townhome Dwelling District

MF1: Multiple-Family Dwelling District-1

MF-2: Multiple-Family Dwelling District-2

P: Parking District

O: Office District

NS: Neighborhood Service District

GR: General Retail District

LC: Limited Commercial District

CB: Central Business District

C: Commercial District

I-1: Light Industrial District

I-2: Heavy Industrial District

HD: Historic District

PD: Planned Development District

UPDD: University Planned Development District

Local Economy

The City and surrounding region are home to several industrial and manufacturing operations, including tire manufacturing, small arms ammunition, paper production, railroad tank car repair, cup, and carton manufacturing, pipeline fittings, truck bodies, furniture, valves and couplings, military equipment repair and refurbishing, trucking, and petroleum marketing. Texarkana is also a regional medical center, with two (2) acute care hospitals, offering 675 beds, two (2) rehabilitation hospitals with 140 beds, a 15-bed geriatric psychiatric inpatient facility, and several mental health centers, ambulatory surgical centers, home health care organizations, nursing home centers, assisted living centers, and retirement communities.

The City's strategic location with the prospect of three (3) interstate highways in the area, a favorable climate, plentiful water supplies, and a good mix of manufacturing, agriculture, government, tourism, education, medical, retail trade and service centers should contribute to future growth and development for the foreseeable future. Current estimates indicate that approximately 80,000 vehicles use the area's interstate system.

The City's primary and secondary education needs are served by three (3) public school districts, and four (4) other public-school districts that border the City, as well as several area private schools. Five (5) institutions of higher education provide services to the City. Texarkana College has more than 5,000 students enrolled; Texas A&M University-Texarkana expanded to a 4-year university in 2010, completed Bringle Lake Village, the first student housing on campus, in 2011 and currently serves approximately 2,000 students; the University of Arkansas for Medical Sciences Area Health Education Center provides higher education services in the area; and Southern Arkansas Tech, provides airframe and power plant training for 150 students at the airport; University of Arkansas – Texarkana is the City's newest institution of higher education, serving approximately 400 students in its new facility. The City has several worthwhile attractions, including the only U.S. Post Office located in two states, which provides a unique photo opportunity at Photographer's Island, the Scott Joplin Mural, the historic Perot Theatre, the Regional Arts Center, the Texarkana Museum of Regional History, the Texarkana Symphony Orchestra, a municipal golf course designed by Jim Fazio, Jr. and constructed by Hank Haney Golf, Inc., and City parks that have hosted a number of district and state athletic tournaments. Noted attractions in the City's parks system include Splash Pad at Spring Lake Park, Kylee Sullivan Pet Safe Dog Park at Spring Lake Park, and the new additions at Bringle Lake Park.

Source: 2019 Texarkana Comprehensive Annual Financial Report

Economic Data

A Comprehensive Plan and/or Land Use Plan serves as a guide for development in the City of Texarkana. These plans focus on the quality of life, housing, community livability, infrastructure and utilities, and transportation. Texarkana/Bowie County is also a member of the Ark-Tex Council of Governments (ATCOG), which assists local governments in planning for common needs, including future development. ATCOG efforts, in part, assist local communities in strengthening both the individual and collective power of their local government in making wise planning decisions with regard to future development, transportation, future business opportunities, and maximizing economies of scale in seeking grant funding for County-wide or Regional mitigation projects.

Economic Impact

Building and maintaining infrastructure depends on the economy; therefore, protecting infrastructure from risk due to natural hazards in the planning area is important to the City of Texarkana. Whether it's expanding culverts under a road that washes out during flash flooding, shuttering a fire station, or flood-proofing a wastewater facility, infrastructure must be mitigated from natural hazards in order to continue providing essential utility and emergency response services in a fast-growing planning area.

Major employers in the area are critical to the health of the economy, as well as effective transportation connectivity.

Major Employers in Texarkana	
Red River Army Depot & Tenants	Liberty Eylau Independent School District
CHRISTUS St. Michael Health System	Texarkana College
Cooper Tire & Rubber	City of Texarkana, Texas
Texarkana Independent School District	AEP SWEPCO
Walmart Department Stores	Pleasant Grove Independent School District
Graphic Packaging	Mayo Manufacturing
Domtar, Inc	Smith-Blair, Inc
DLA Distribution	Texas A&M University - Texarkana
Wadley Regional Medical Center	Albertson's
Collom & Carney Clinic	E-Z Mart Stores, Inc.
Ledwell & Son's Enterprises	LifeNet, Inc.
Wholesale Electric	Sterno Products

Source: <https://www.texarkana.org/major-employers>

Critical Facilities and Infrastructure

Critical infrastructure and facilities are those that are essential to the health and welfare of the population. These facilities are especially important after any hazard event. Critical facilities are those that maintain essential and emergency functions and are typically defined to include police and fire stations, schools, and emergency operations centers. Critical infrastructure can include the roads and bridges that provide ingress and egress and allow emergency vehicles access to those in need and the utilities that provide water, electricity, and communication services to the community. Also included are Tier II facilities (hazardous materials) and rail yards; rail lines hold or carry significant amounts of hazardous materials with a potential to impact public health and welfare in a hazard event.

Emergency Facilities

<i>Name</i>	<i>Type</i>	<i>Address</i>
Central Records & Communications (Dispatch)	Dispatch Center	101 N State Line Ave, Texarkana, TX 75501
EOC	EOC	1101 W. 21 ST St, Texarkana, TX 75501
Back UP EOC	EOC	4808 Elizabeth St, Texarkana, TX 75501
Fire Administration	Administration	919 Elm St, Texarkana, TX 75501
Fire Station One	Fire Station	524 W Third St, Texarkana, TX 75501
Fire Station Three	Fire Station	5706 Richmond Rd, Texarkana, TX 75503
Fire Station Five	Fire Station	306 S Kenwood St, Texarkana, TX 75501
Fire Station Seven	Fire Station	3101 S Lake Dr, Texarkana, TX 75501
Fire Station Nine	Fire Station	4315 Summerhill Rd, Texarkana, TX 75503
LifeNet EMS	EMS	6225 St Michael Dr, Texarkana, TX 75503
Texarkana Texas Police Dept.	Police Station	101 N. State Line Ave, Texarkana, TX 75501
Special Operations Training Center (SOTC)	Public Safety	1420 S Park Rd, Texarkana, TX 75501
Texas Department of Public Safety	Public Safety	1516 Hampton Rd, Texarkana, TX 75501

Schools

<i>Name</i>	<i>Type</i>	<i>Address</i>
Liberty Eylau Independent School District	Administration	2901 Leopard Dr, Texarkana, TX 75501
LEISD Early Childhood Center	PreK - K	3105 Norris Cooley Dr, Texarkana, TX 75501
LEISD Elementary School (Rock School)	Elementary School	5492 US-59, Texarkana, TX 75501
LEISD Middle School	Middle School	5555 Leopard Dr, Texarkana, TX 75501
LEISD High School	High School	2905 Leopard Dr, Texarkana TX 75501
LEISD School of Success	High School	766 Macedonia Rd, Texarkana, TX 75501
Pleasant Grove Independent School District	Administration	8500 North Kings Hwy, Texarkana, TX 75503
PGISD Margaret Fischer Davis Elementary School	Elementary School	2800 Galleria Oaks Dr, Texarkana, TX 75503
PGISD Intermediate School	Intermediate School	8480 N Kings Highway, Texarkana, TX 75503
PGISD Middle School	Middle School	5605 Cooks Ln, Texarkana, TX 75503
PGISD High School	High School	5406 McKnight Rd, Texarkana, TX 75503
Texarkana Independent School District	Administration	4241 Summerhill Rd, Texarkana, TX 75503
TISD Paul Laurence Dunbar Early Education Center	Pre-Kindergarten	2315 W 10 th St, Texarkana, TX 75503
TISD Goree Academic Learning Center	Elementary and Secondary	3201 Lincoln St, Texarkana, TX 75503

TEXARKANA HAZARD MITIGATION PLAN UPDATE 2024

TISD Highland Park Elementary	Elementary School	401 W 25 th St, Texarkana, TX 75503
Martha and Josh Morris Mathematics & Engineering Elementary	Elementary School	4826 University Park, Texarkana, TX 75503
Spring Lake Park Elementary	Elementary School	4324 Ghio Fish Blvd, Texarkana, TX 75503
Theron Jones Early Literacy Center	Elementary School	2600 W 15 th St, Texarkana, TX 75501
Waggoner Creek Elementary	Elementary School	6335 Gibson Ln, Texarkana, TX 75501
Westlawn Elementary	Elementary School	410 Westlawn Dr, Texarkana, TX 75503
TISD Middle School	Middle School	2100 College Dr, Texarkana, TX 75503
TISD High School	High School	4001 Summerhill Rd, Texarkana, TX 75503
Saint James Day School	Preschool through Eighth	5501 N State Line Ave, Texarkana, TX 75503
Texarkana College	College	2500 N Robison Rd, Texarkana, TX 75599
University of Texas A&M - Texarkana	University	7101 University Ave, Texarkana, TX 75503

Hospital and Medical Facilities

<i>Name</i>	<i>Type</i>	<i>Address</i>
Christus Saint Michael Hospital ER/Radiology	Hospital	2600 Saint Michael Dr, Texarkana, TX 75503
Christus Saint Michael Specialty Hospital	Hospital	2400 Saint Michael Dr, Texarkana, TX 75503
Post-Acute Medical Hospital (North)	Hospital	2400 Saint Michael Dr, Texarkana, TX 75503
Christus Saint Michael Day Rehab and Wound Center	Hospital	1801 Galleria Oaks Dr, Texarkana, TX 75503
Christus Saint Michael CORF	Hospital	2223 B Galleria Oaks Dr, Texarkana, TX 75503
Texarkana Emergency Center and Hospital	Hospital	4646 Cowhorn Creek Rd, Texarkana, TX 75503
Health South Rehabilitation Hospital	Hospital	515 W 12 th St, Texarkana, TX 75501
Wadley Regional Medical Center	Hospital	1000 Pine St, Texarkana, TX 75501
SignatureCare Emergency Center	Standalone ER	2001 Mall Dr, Texarkana, TX 75503
Express Care	Urgent Care	5483 Summerhill Rd, Texarkana, TX 75503
HealthCARE Express	Urgent Care	3515 Richmond Rd, Texarkana, TX 75503
Texarkana Surgery Center	Surgery Center	5404 Summerhill Rd, Texarkana, TX 75503
Surgery Center of Northeast Texas	Surgery Center	1902 Moores Ln, Texarkana, TX 75503

Nursing Homes

<i>Name</i>	<i>Address</i>
Cornerstone Retirement Community	4100 Moores Ln, Texarkana, TX 75503
Christian Care Center	1008 Citizens Trail, Texarkana, TX 75501
Edgewood Manor	4925 Elizabeth St, Texarkana, TX 75503
Heritage Plaza Nursing Center	600 W 52 nd St, Texarkana, TX 75503
Reunion Plaza Senior Care and Rehabilitation Center	1401 Hampton Rd, Texarkana, TX 75503
The Villa at Texarkana	4920 Elizabeth St, Texarkana, TX 75503
The Waterton at Cowhorn Creek	5524 Cowhorn Creek Rd, Texarkana, TX 75503

Assisted Living Facilities

<i>Name</i>	<i>Address</i>
Brookdale Texarkana	4204 Moores Ln, Texarkana, TX 75503
Cornerstone Retirement Community	4100 Moores Ln, Texarkana, TX 75503
Colonial Lodge Assisted Living	5001 N Elizabeth, Texarkana, TX 75503
Magnolia Assisted Living	4205 Richmond Meadows, Texarkana, TX 75503
Oaks Assisted Living	4317 McKnight Rd, Texarkana, TX 75503
The Retreat at Kenwood	210 N Kenwood Rd, Texarkana, TX 75501
Whispering Pines	5002 Elizabeth St, Texarkana, TX 75503

Utilities

<i>Name</i>	<i>Type</i>	<i>Address</i>
Water Treatment Plant	Water	2700 New Boston Rd, Texarkana, TX 75501
Wastewater Treatment Plant	Wastewater	4000 South State Line, Texarkana, TX 75501
Texarkana Water Utilities	Administration	801 Wood St, Texarkana, TX 75501
SWEPCO	Electricity	3708 W. 7 th St., Texarkana, TX 75501
Bowie Cass Electric Cooperative	Electricity	117 North St, Douglasville, TX 75560
REA Cooperative	Electricity	2904 E 9 th St, Texarkana, AR 71854
Windstream	Communications	2525 Richmond Rd, Texarkana, TX 75503
Sparklight	Communications	401 Baylor St, Texarkana, TX 75501
Summit Utilities	Gas	2802 N. State Line Ave, Texarkana, AR 71854

City Buildings

<i>Name</i>	<i>Address</i>
City Hall	220 Texas Blvd, Texarkana, TX 75501
Southwest Recreation Center	3222 W 7 th St, Texarkana, TX 75501
Collins Senior Center	3002 Texas Blvd, Texarkana, TX 75501
Bowie County Family Health Clinic	902 W 12 th St, Texarkana, TX 75501
Texarkana Library	600 W 3 rd St, Texarkana, TX 75501
Public Works	220 Texas Blvd, Texarkana, TX 75501
Alaska Printing	2916 Texas Blvd, Texarkana, TX 75501
Bi-State Justice Center	100 N State Line Ave, Texarkana, TX 75501
Perot Theatre	221 Main St, Texarkana, TX 75501
Texarkana Convention Center	4610 Cowhorn Creek Rd, Texarkana TX 75501
Fleet Services	923 Elm St, Texarkana, TX 75501
Radio Tower	New Boston Rd, Texarkana

Critical Infrastructure

Railway		
<i>Name</i>	<i>Type</i>	<i>Address</i>
Railroad Yards	Rail Service / Distribution	Various
Union Pacific Railroad	Rail Service	Various
Kansas City Southern	Rail Service	Various
BNFS Railway	Rail Service	Various

Tier II Facilities

Tier II Facilities	
<i>Facility Name</i>	<i>Physical Address</i>
TCl Texarkana	300 Alumax Dr, Texarkana, TX, 75501
Red River Army Depot	100 James Carlow Dr, Texarkana, TX, 75501
Coca Cola Southwest Beverages Texarkana	1930 New Boston Rd, Texarkana, TX, 75501
Ledwell & Son Enterprises	3300 Waco St, Texarkana, TX, 75501
Nalco Production Texarkana	3901 Terry St, Texarkana, TX, 75501
Valicor Environmental Services - Texarkana	7600 Alumax Rd, Texarkana, TX, 75501
Texana Tank Car Manufacturing	290 County Road 1223, Texarkana, TX 75501
TXDOT-Atlanta-Texarkana Area Office and Maintenance	520 Sowell Ln, Texarkana, TX 75501
Sam's Club #8295	3610 Saint Michael Dr, Texarkana, TX 75503
Airgas USA Mid-South Texarkana	3503 W 7th St, Texarkana, TX 75501
Texarkana Central Office	500 Olive St, Texarkana, TX 75501
Ellsworth Freight Lines	4300 Gazola St, Texarkana, TX 75501
Miller-Bowie Supply Co.	1007 W 3rd St, Texarkana, TX 75501
HealthSouth Rehab Hospital Of Texarkana	515 W 12th St, Texarkana, TX 75501
Texarkana West Central Office	924 Elliott Rd, Texarkana, TX 75501
The Sterno Group	303 Falvey Ave, Texarkana, TX 75501
Red River Oil	700 Plum St, Texarkana, TX 75501
Waste Management Texarkana Hauling	2708 W 7th St, Texarkana, TX 75501
Texarkana Ready Mix	2515 W 7th St, Texarkana, TX 75501
Texarkana Service Center	3708 W 7th St, Texarkana, TX 75501
Texarkana Independent School District	1620 W 10th St, Texarkana, TX 75501
Texas Department of Public Safety	1516 Hampton Rd, Texarkana, TX 75503
Sgs- Texarkana	7705 N State Line Ave, Texarkana, TX 75503
Federal Correctional Institution	4001 Leopard Dr, Texarkana, TX 75501
The Home Depot Store #6580	4110 Saint Michael Dr, Texarkana, TX, 75503
Lowe's Of Texarkana Tx (#174)	501 Walton Dr, Texarkana, TX 75501
Love's Travel Stop #473	451 Leary Rd, Texarkana, TX 75501
Texana Midway Tank Cleaning Facility	2474 Tri State Rd, Texarkana, TX 75501
Ferrellgas Texarkana	1200 S Kings Hwy, Texarkana, TX 75501
Northwest Texarkana Substation	FM 2209 0.6 Miles N of Myrtle Springs Rd, 75503
Welchgas	7750 W 7th St, Texarkana, TX 75501
TXDOT-Atlanta-Texarkana Mnt - Remote Location	Remote Roadway Maintenance Stockpile. Located at Intersection of IH30 and FM 2253. Shiloh Rd, 75503
Stuart UNIT 1	From Texarkana: Take TX-93 S 3.7 mi, cont on US-59 S 1.9 mi, Turn right on Eylau Loop Rd 449 ft, Turn left 0.1 mi, 75501
CHS Texarkana	1314 Phenie St, Texarkana TX 75501

Interstate Access

I-30: Travels Northeast from Fort Worth, Texas, through Dallas and Texarkana to Little Rock, Arkansas.
I-49: Intersects I-30 in Texarkana and extends south to Louisiana, passing through Shreveport and Alexandria, and terminating in Lafayette.
Future I-69 (currently I-369): Currently under construction, this 1,600-mile-long route will eventually run north–south from Michigan to Texas, connecting with Texarkana at I-30. I-369 serves as a connection between IH 30 in the north and US Highway 151 to the south.

Highways

U.S. Route 59: Runs north–south from the Canada–United States border in Michigan to the Mexico–United States border in Laredo, Texas, connecting seven states along the way.
U.S. Route 67: Extends 1,560 miles across the Central United States, from the Mexico–Texas border, Northeast to Arkansas and continuing north to Missouri, Illinois and Iowa.
U.S. Route 71: A major transportation artery that runs north–south, from Louisiana to Texas, through Arkansas, Missouri, Iowa, and Minnesota.
U.S. Route 82: Spans 1,625 miles east-to-west, connecting New Mexico, Texas, Arkansas, Mississippi, Alabama, and Georgia.

Other Highways

US 151: this US Highway forms the southern border of Texarkana and connects IH 369 in the west to IH 49 in the east in Arkansas.

Principal Arterials

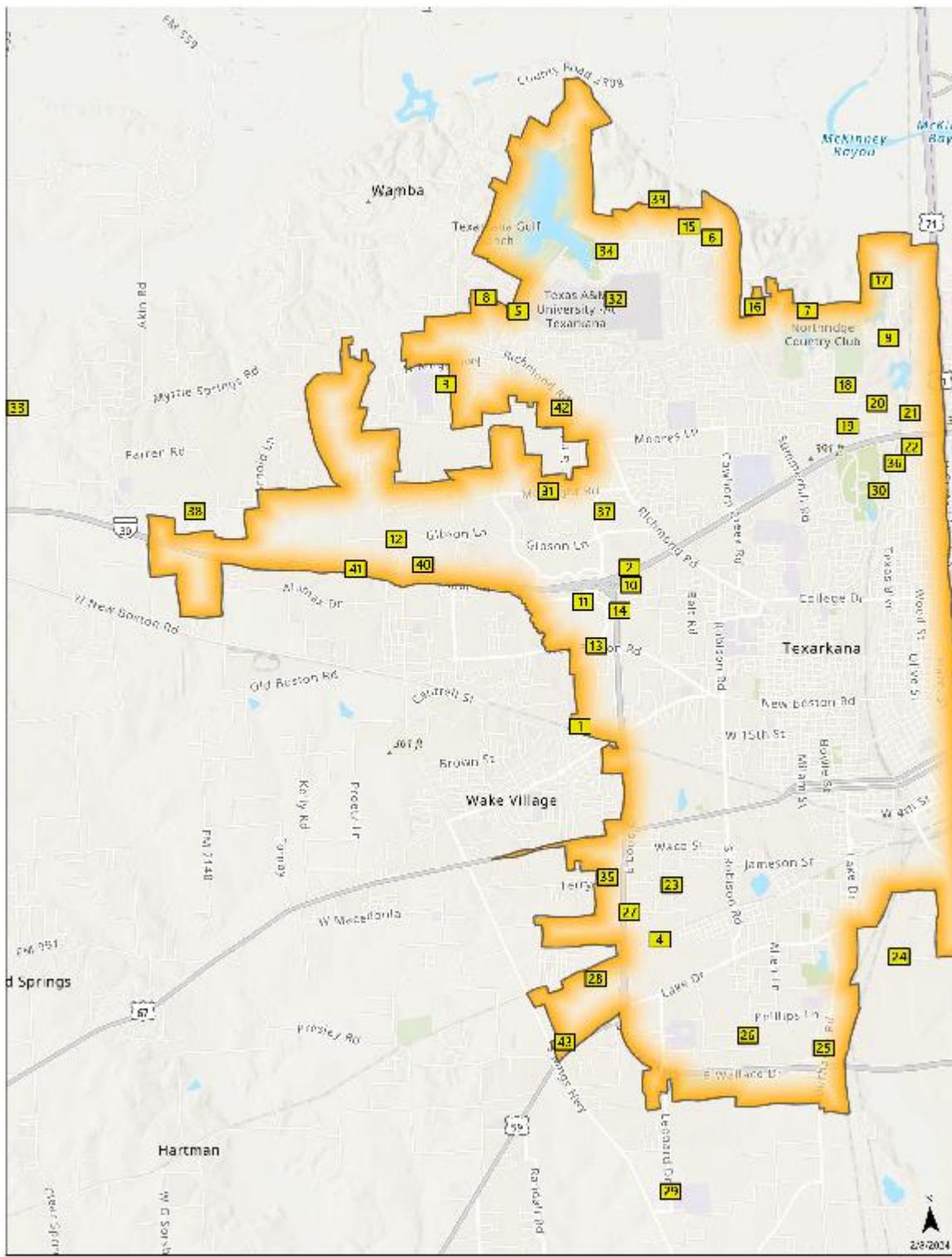
SH 93/Summerhill Rd: this major arterial runs through highly urbanized parts of Texarkana going from the southwestern edge up towards Bringle Lake in the north.
SH 67: this arterial serves as a major east-west connector through the center of the city. East of the railroad tracks the state highway splits into W. 7th Street and Martin Luther King Jr. Boulevard, which both run through downtown Texarkana.
SH 82/New Boston Rd: this major arterial also serves traffic going east-west towards downtown and ends at Texas Boulevard.
SH 71/State Line Ave: this iconic road serves as the boundary between Texas and Arkansas. As mentioned previously, it serves as the primary roadway for drivers travelling from IH 30 to get to downtown Texarkana.
Spur 559/Richmond Rd: this major arterial connects the newer parts of Texarkana north of IH 30 to the center of town.
US 14/Texas Blvd: this roadway is known as Texas Boulevard and Arkansas Boulevard in their respective states. It serves as a major roadway in downtown.

Data Source: Texarkana 2018 Comprehensive Plan

Lift Stations

Pump Station	Facility ID	Location Description
1	SWR-PUMP.0001	Waggoner Creek
2	SWR-PUMP.0003	Home Depot
3	SWR-PUMP.0007	Cerrato Ln
4	SWR-PUMP.0008	Findley Ave
5	SWR-PUMP.0009	Scott-Wright
6	SWR-PUMP.0010	Shilling 3
7	SWR-PUMP.0011	Pine Creek Pl
8	SWR-PUMP.0012	Big Oak Ln
9	SWR-PUMP.0014	Lakeridge 2
10	SWR-PUMP.0015	Classic Autos
11	SWR-PUMP.0017	Walton Dr
12	SWR-PUMP.0019	989
13	SWR-PUMP.0020	Walmart
14	SWR-PUMP.0021	Union Hall
15	SWR-PUMP.0022	Shilling 1
16	SWR-PUMP.0023	Dogwood Place
17	SWR-PUMP.0024	Lakeridge 1
18	SWR-PUMP.0025	Winchester
19	SWR-PUMP.0026	Cork Ln
20	SWR-PUMP.0027	Century In
21	SWR-PUMP.0028	North Gate
22	SWR-PUMP.0029	La Quinta
23	SWR-PUMP.0038	Hatton
24	SWR-PUMP.0039	PS 200
25	SWR-PUMP.0042	Buchanan Rd
26	SWR-PUMP.0043	Creek Bend
27	SWR-PUMP.0044	Industrial Park
28	SWR-PUMP.0045	Picoma
29	SWR-PUMP.0046	Prison Rd
30	SWR-PUMP.0047	North Park
31	SWR-PUMP.0049	5200 McKnight Rd Mini Lift Sta
32	SWR-PUMP.0051	Deerwood
33	SWR-PUMP.0052	Leary
34	SWR-PUMP.0053	Bringle Lake
35	SWR-PUMP.0054	Wake Village Rd
36	SWR-PUMP.0056	Elizabeth St Duplexes (Private)
37	SWR-PUMP.0058	The Oaks
38	SWR-PUMP.0059	Chesterfield
39	SWR-PUMP.0060	Stonecreek
40	SWR-PUMP.0066	St Michael Dr 6243
41	SWR-PUMP.0067	Hampton 2
42	SWR-PUMP.0068	Gin Road
43	SWR-PUMP.L0001	RaceTrac

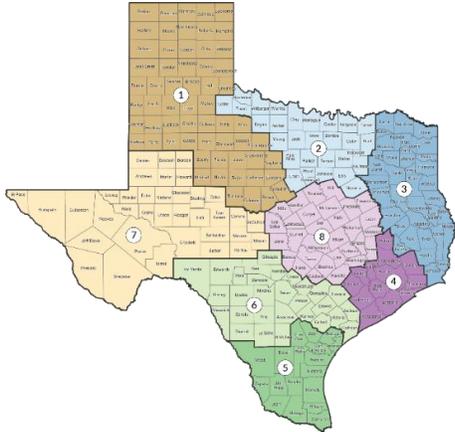
Map of Lift Stations



Source: TWU

The City of Texarkana, Texas is in Region 3 for the Texas Division Emergency Management (TDEM), Region 1 for the Texas Department of Public Safety (DPS) and Region 6 for the Federal Emergency Management Agency (FEMA).

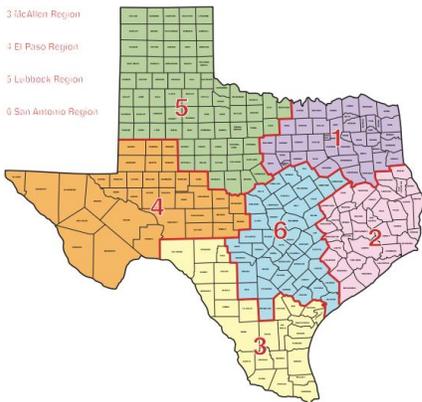
TDEM Region 3



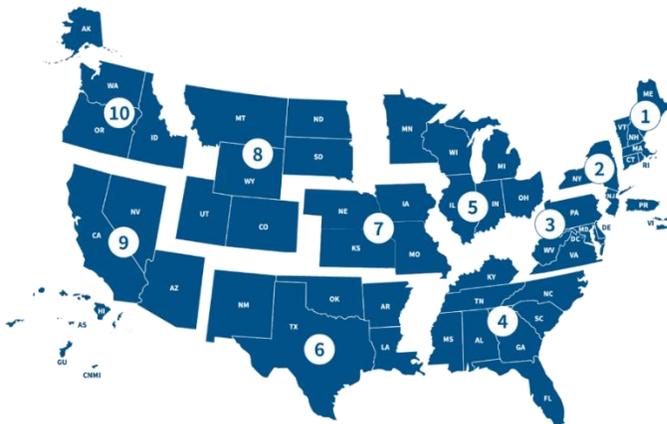
DPS Region 1

Regional Boundaries

- 1 Dallas Region
- 2 Houston Region
- 3 Dallas Region
- 4 El Paso Region
- 5 Lubbock Region
- 6 San Antonio Region



FEMA Region 6



Vulnerability Assessment

Environmental Assets

Humans have always relied on nature for environmental assets like clean water and soil formation. Today, these assets are receiving global attention as 'ecosystem services', the conditions and processes by which natural ecosystems sustain and fulfill human life. Once human development exceeds the planetary capacity for self-repair, environmental assets can collapse and disappear, never to reappear. Admittedly, some environmental assets and functions are repairable or substitutable (individual trees can be replanted; water can be transported), but many others (a delicate wetland habitat for example) are not.

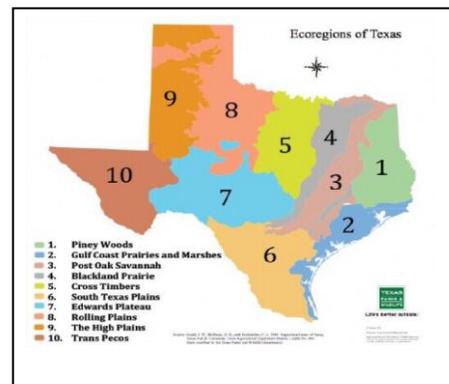
Source: *sciencedirect.com*

Ecoregion

The State of Texas is divided into 10 natural regions or ecoregions, with Texarkana located in the South-Central Plains, locally termed the “Piney Woods” region. The Piney Woods region is comprised of rolling terrain once blanketed by a mix of pine and hardwood forests, much of the region is now in loblolly and shortleaf pine plantations. Numerous species of neotropical birds, waterfowl, furbearers and reptiles inhabit this heavily forested and historically diverse ecosystem.

The average annual rainfall varies from 42 to 58 inches, and humidity and temperatures are typically high. This area is prone to tornadoes and hailstorms. During times of drought, the area can be particularly vulnerable to wildfire as vegetation can serve as fuel for wildfire.

Conservation and restoration efforts are essential for the survival of this ecosystem and can be accomplished by offering technical advice and incentives to private landowners to voluntarily protect wildlife habitats. Water conservation, invasive plants, and animals as well as land fragmentation and erosion will continue to be important challenges facing the Piney Woods ecoregion.

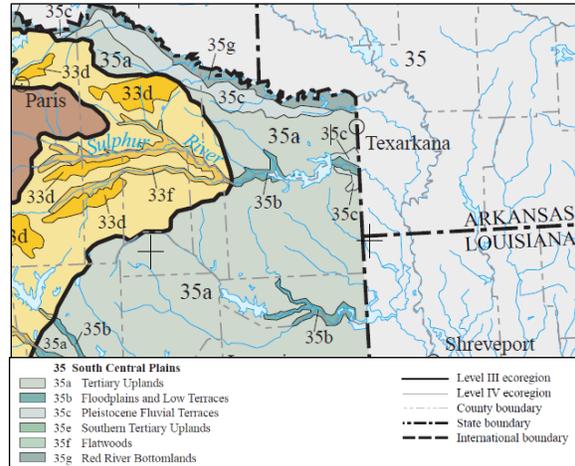


The soils of the region are generally acidic and mostly pale to dark gray sands or sandy loams. Elevations range from 200 to 500 feet above sea level. The Piney Woods region can be described as pine and pine-hardwood forests with scattered areas of cropland, planted pastures, and native pastures. Timber and cattle production are important industries in the region. Farms and ranches are relatively small in size compared to the state average.

Data Source: TWDB

Tertiary Uplands

Texarkana is located in the rolling Tertiary Uplands, which can be characterized as gently to moderately sloping, and covers a large area in east Texas. The landscape is dissected by numerous small streams, and the region contains a diversity of habitats and species. In east Texas, Tertiary deposits are mostly Eocene sediments, with minor amounts of Paleocene and Cretaceous sediments in the north. Soils are mostly well-drained Ultisols and Alfisols, typically with sandy and loamy surface textures.



Data Source: EPA

East Texas Timberland Soils

One of the most important natural resources in Texas is its soil. More than 1,300 different kinds of soil are recognized in Texas. Each has a specific set of properties that affect its use.

Texarkana is included in the East Texas Timberlands area, which comprises about 16.1 million acres of the forested eastern part of the state. The land is gently undulating to hilly and well dissected by many streams. Surface drainage is moderate to rapid.

This area has many kinds of upland soils, but most are deep, light-colored, acid sands and loams over loamy and clayey subsoils. Deep sands are in scattered areas, and red clays are in areas of “redlands.” Bottomland soils are mostly brown to dark-gray, acid loams and some clays.

The land is used mostly for growing commercial pine timber and for woodland grazing. Improved pastures are scattered throughout and are used for grazing beef and dairy cattle and for hay production. Some commercial hardwoods are in the bottomlands. Woodland management problems include seedling survival, invasion of hardwoods in pine stands, effects of logging on water quality, and control of the southern pine beetle. Lime and fertilizers are necessary for productive cropland and pastures.



Source: Natural Resources Conservation Service, U.S. Department of Agriculture
 Source: texasalmanac.com

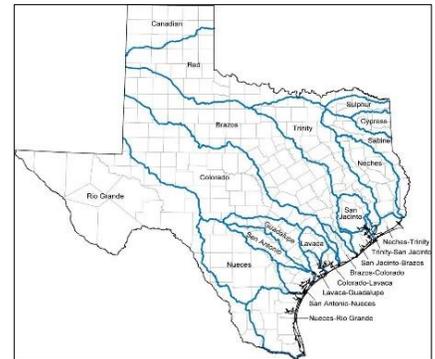
Hydrology

Water is one of our most precious natural resources. Without it, there would be no life on earth. Hydrology has evolved as a science in response to the need to understand the complex water system of the earth and help solve water problems.

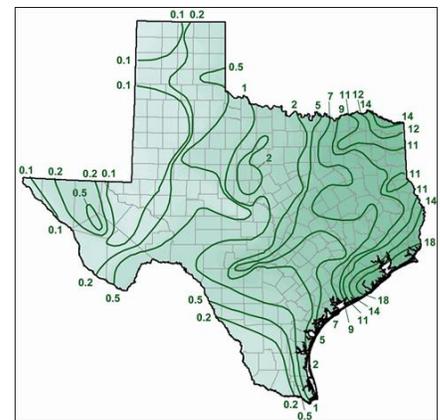
In Texas, there are 15 major river basins and eight coastal basins, each with varying hydrological regimes and water supply capabilities. Each basin has several unique features, both climatic (such as precipitation and evaporation), as well as physiographic (geology, slope, soil type, vegetation, and land use practices). These unique features contribute to the nature of runoff from the basins. The Features of the Sulphur River Basin table below provides a summary of the major river basins and includes the pertinent watershed area, river length and average flow.

Sulphur River Basin

The Sulphur River Basin is in the northeast corner of Texas and includes all or part of Fannin, Hunt, Lamar, Hopkins, Red River, Franklin, Titus Morris, Bowie, Cass, and Delta counties. The Sulphur River Basin Authority monitors and controls the river basin by operating river gauges and dams that help monitor and regulate the river flow and manage flood hazards. They also help to protect, develop, and manage the water quantity and quality of the basin as well as provide recreation areas for surrounding communities. *Data Source: TWDB*



The Sulphur Basin has the largest average watershed yield of any major river basin in Texas because of the region’s high precipitation and low evaporation rates. From the confluence of North and South Sulphur rivers in East Texas, the Sulphur River flows into its confluence with the Red River in Arkansas. Smaller streams in the basin include the North, Middle, and South Sulphur rivers and White Oak Creek. Because the Sulphur River is a tributary of the Red River, surface water within the basin is apportioned by the Red River Compact between Texas, Oklahoma, Arkansas, and Louisiana. The basin is an important source of surface water supply for surrounding regions. Balancing environmental needs with continued development of surface water supplies is an issue in the basin. *Data Source: TWDB*



The U.S. Army Corps of Engineers – Southwestern Division, also plays a significant role in flood management through the operation and maintenance of their dams, flood damage reduction reservoirs, and levees.

Watersheds

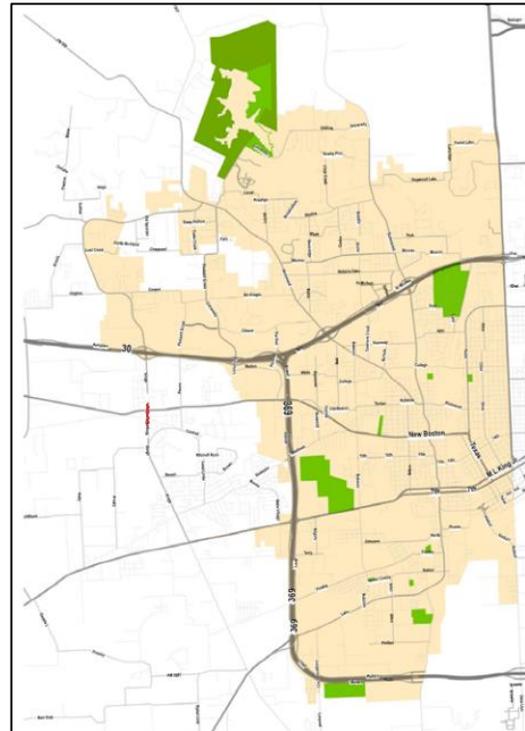
There are five (5) main watersheds within the City of Texarkana that encompass a total watershed area of approximately 40.5 square miles: Clear Creek, Cowhorn Creek, Howard Creek, Swampoodle Creek and Wagner Creek. Elevations in the study area range from a high of about 380 feet (ft) in the upper reaches to a low of about 260 feet at the watershed outlet. The existing conditions range from flat non-defined channels to deep, well defined, and improved channels. Most of the stream crossings are concrete bridges and culverts. Several stream crossings restrict natural flow and cause water to backup and overflow.

Data Source: City wide Flood Protection Planning Study for the City of Texarkana, Texas (January 2012)

Natural and Cultural Resources

Within Texarkana, there are 11 parks that cover approximately 500 acres. This includes one regional park, one natural area, three community parks, and five neighborhood parks. Bringle Lake is a large reservoir just outside the incorporated city limits near Texas A&M University and offers a wilderness area where visitors can hike, camp, and fish. In terms of habitat, Texarkana is located in the Piney Woods ecoregion of Texas which is characterized by rich forests and scattered areas of cropland.

Data Source: Texarkana 2018 Comprehensive Plan



Map of Parks in the City

Waterways

Portions of the city, mostly following waterways, are located in the 100-year floodplain, which means that there’s a 1% chance there will be a historic flood event each year. There are also some impaired streams in the city, including Swampoodle Creek just east of downtown and Cowhorn Creek between Summerhill Road and Robinson Road.

Data Source: Texarkana 2018 Comprehensive Plan

Historical Buildings and Districts

Historic landmarks and districts are important to consider when evaluating vulnerabilities to hazards. What is historic, and worth saving, varies with the beholder. “Historic” applies to a building that is part of a community’s tangible past. Due to the advanced age of these structures, they are highly susceptible to cracking, leaning, and total destruction caused by any of the hazards.

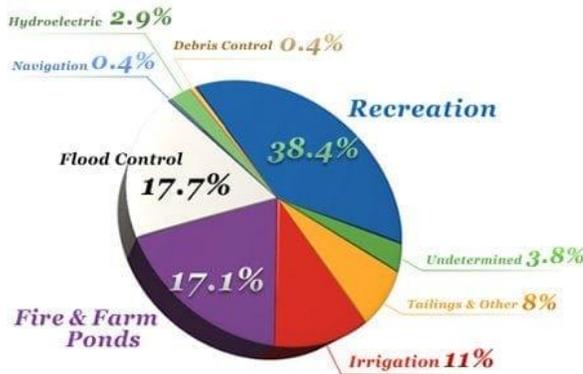
Historic buildings and structures, artwork, monuments, family heirlooms, and historic documents are often irreplaceable, and may be lost forever in a disaster if not considered in the mitigation planning process. The loss of these resources is all the more painful because of how often residents rely on their presence after a disaster, to reinforce connections with neighbors and the larger community, and to seek comfort in the aftermath of a disaster.

Texarkana is rich in history so it's not surprising that there are many historical landmarks within the city. As of August 2022, there are fourteen landmarks designated on the National Register of Historic Places, one landmark designated as a State Antiquities Landmark, eighteen sites designated as a Recorded Texas Historic Landmark, and one Historic Texas Cemetery. Some of these well-known landmarks include the Perot Theater, Hotel Grim, Texarkana U.S. Post Office and Courthouse, Texarkana Union Station, and the Rialto Building. *Data Source: Texas Historical Commission. Texas Historic Sites Atlas.*

Dams

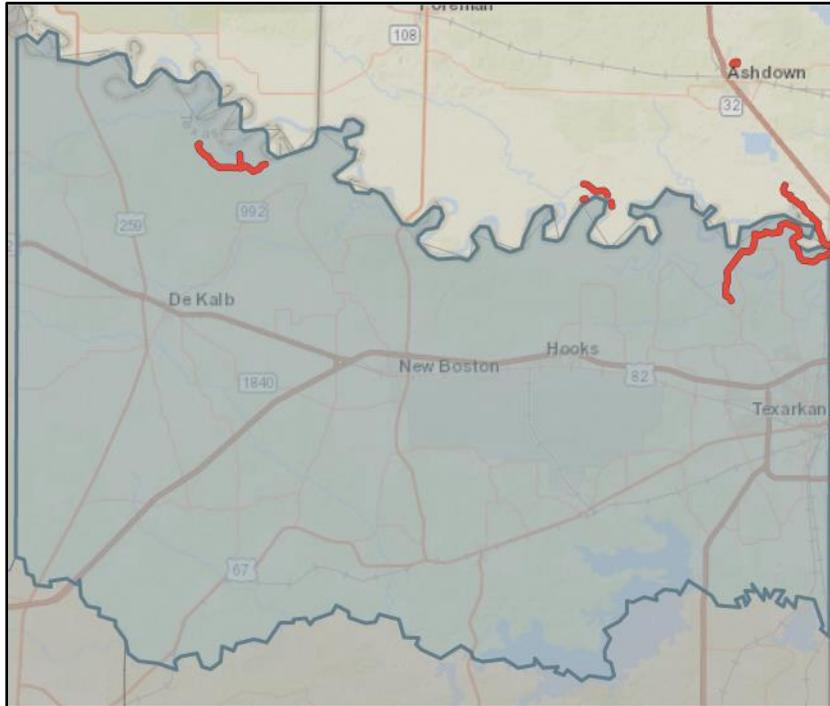
Dams provide a range of economic, environmental, and social benefits, including recreation, flood control, water supply, hydroelectric power, waste management, river navigation, and wildlife habitat.

The graph to the below reflects the benefits of dams in the United States.



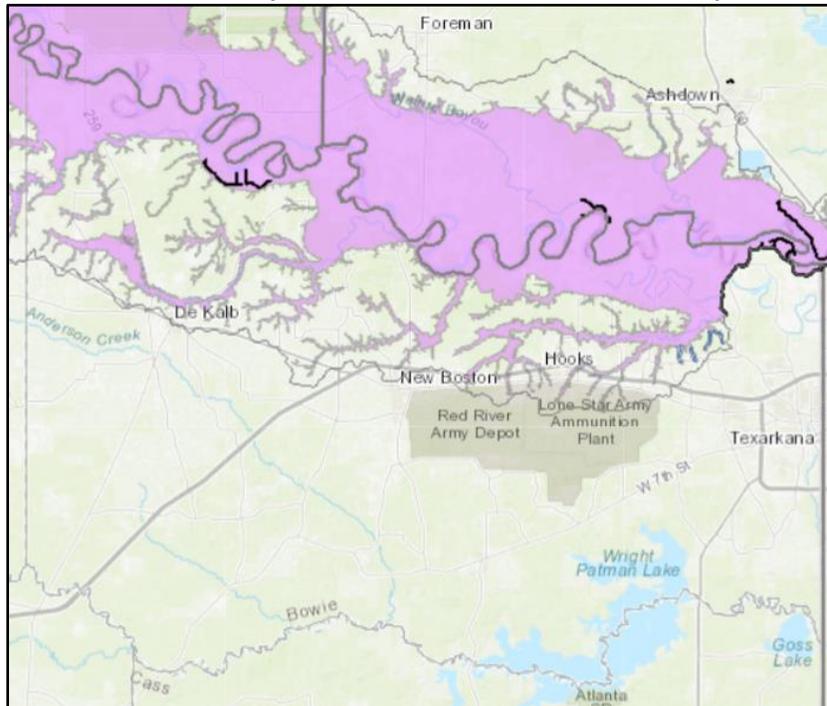
A list of dams is located in, Section 4: Hazard Profiles - Dam/Levee Failure Locations

Bowie County has 5 levee systems which equals to 101 miles of levees



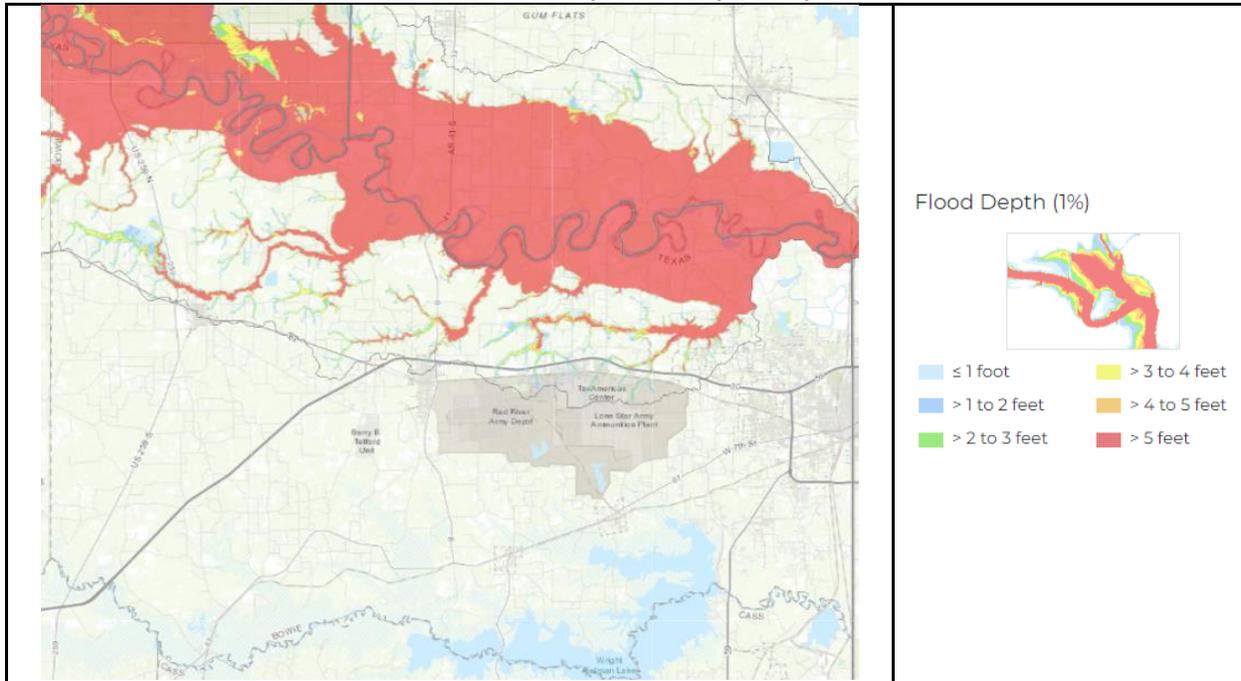
Source: <https://levees.sec.usace.army.mil/#/>

Bowie County Estimated Base Flood Elevation Map



Source: <https://webapps.usgs.gov/infrm/estBFE/>

Bowie County Flood Depth Map



Source: <https://webapps.usgs.gov/infrm/estbfe/>

Vulnerable Populations

DMA 2000 requires that HMPs consider socially vulnerable populations. These populations can be more susceptible to hazard events, based on a number of factors including their physical and financial ability to react or respond during a hazard and the location and construction quality of their housing.

Physically or Mentally Disabled

According to the Centers for Disease Control (CDC), “Persons with a disability include those who have physical, sensory, or cognitive impairment that might limit a major life activity (Centers for Disease Control 2015).” Cognitive impairments can increase the level of difficulty that individuals might face during an emergency and reduce an individual’s capacity to receive, process, and respond to emergency information or warnings. Individuals with a physical or sensory disability can face issues of mobility, sight, hearing, or reliance on specialized medical equipment. According to the 2020 American Community Survey, 11.7% of residents in Texarkana, Texas are living with a disability as compared to 11.5% in the State of Texas.

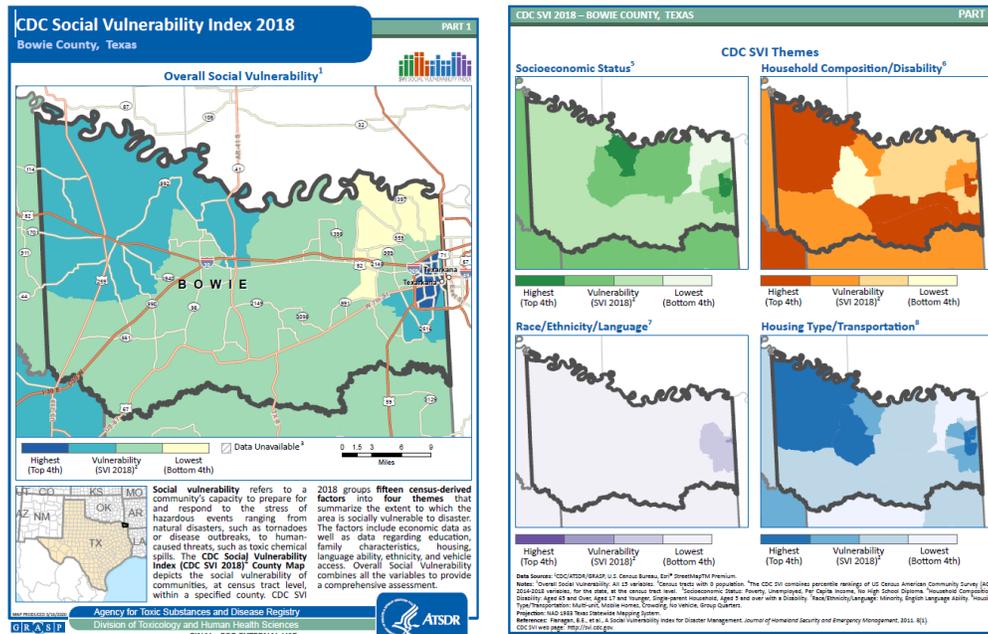
Non-English Speakers

Individuals who are not fluent or working proficiency in English are vulnerable because they can have difficulty with understanding information being conveyed to them. Cultural differences also can add complexity to how information is being conveyed to populations with limited proficiency of English (Centers for Disease Control 2015). According to the 2020 American Community Survey, nearly 7.0% of the City’s population over the age of 5 primarily speaks a language other than English at home as compared to 35.1% in the State of Texas.

Social Vulnerability

Social Vulnerability Index (SVI) is an important metric when evaluating hazard vulnerabilities. It reflects the ability of communities to respond and recover from disasters. Social vulnerability tends to increase as populations are poorer and more rural. According to the United Nations Office for Disaster Risk Reduction (UNISDR), research over the past 30 years has shown that the poor tend to suffer the worst from disasters. Rural communities are also more vulnerable because they often don't have the resources to absorb losses caused by disasters. According to the CDC, the 2018 overall SVI score for Bowie County is 0.8529 which indicates a high level of vulnerability. Possible scores range from 0 (lowest vulnerability) to 1 (highest vulnerability).

Centers for Disease Control and Prevention SVI for Bowie County



Data Source: https://www.atsdr.cdc.gov/placeandhealth/svi/at-a-glance_svi.html

The percentage of individuals living in poverty in Texarkana is high; in 2020 approximately 21.9% of residents lived below the poverty level as determined by the 2020 American Community Survey, as compared to 14.2% in Texas. This is roughly the same as the percentage of impoverished individuals in 2000. These populations are more vulnerable to natural hazards because they often lack the resources needed to prepare, respond, and recover from disaster.

Transportation Systems

The City of Texarkana offers many transportation avenues for both people and cargo, including interstates, major highways, railroads, and an airport. The map below reveals the City of Texarkana, Texas current transportation system.

City of Texarkana Transportation System



Data Source: <https://www.txdot.gov/inside-txdot/forms-publications/maps.html>

Railroads

Passenger rail service in Texarkana is served by the Texas Eagle route via Amtrak service. This route connects Los Angeles to Chicago. Texarkana Union Station is a historic train station, completed in 1929 and is located in the downtown area and straddles the Arkansas and Texas state borders. In 1978 the structure was listed on the US National Register of Historic Places. In addition to passenger rail, there are several freight lines that pass through the city.



Data Source: *Texarkana 2018 Comprehensive Plan*

Freight Services are provided by Union Pacific Railroad, Kansas City Southern, Texas & Pacific Railroad former Missouri Pacific Railroad, and BNFS Railway.

The T&P line to Sherman is only an industrial spur but the other lines continue as major routes for KCS and UP.

Data Source: <http://txrrhistory.com/towers/042/042.htm>

Bus Transportation

The Texarkana Urban Transit District is the primary provider of public transit and paratransit services in the Texarkana Metropolitan Area. Branded as T-Line, the bus provides transportation to major areas of town along 8 different routes.



Data Source: <http://www.t-linebus.org/>

Airport

There is one regional airport serving the Texarkana region since 1928 and is located on the Texarkana, Arkansas side just a few miles from downtown. Texarkana Regional Airport, also known as Webb Field, is a public use airport, covers 964 acres and has two runways.

Flights out of Texarkana are available through American Eagle Airlines. A nearly \$40 million project set to be complete in the fall of 2024, includes not only a new terminal, but upgraded aircraft taxiways, parking lots and jet bridges for loading passengers. From the ground, the airport is accessible via US 67 from the south or IH 30 from the north. The new terminal, once complete, will be accessible from Interstate 49.

Data Source: Texarkana 2018 Comprehensive Plan; <https://www.txkairport.com/>

Section 3: Planning Process

Overview

The planning process is as important as the plan itself. Any successful planning endeavor involves a cross-section of stakeholders in order to reach consensus on desired outcomes. The National Mitigation Framework emphasizes the valuable role of collaboration among various stakeholders to ensure mitigation capabilities continually progress and that comprehensive mitigation includes strategies for the whole community.

The updating of the City of Texarkana, Texas Hazard Mitigation Plan (HMP) occurred with the active participation of Hazard Mitigation Planning Teams HMPT. The HMPT was tasked with the development and completion of the HMP as required per state and federal guidelines. The Office of Emergency Management oversaw the project, organized the data, set meeting dates, and worked with the Texas Division of Emergency Management (TDEM) to complete the HMP.

History of Hazard Mitigation Planning in Texarkana, Texas

In 2004, the City of Texarkana, Texas was awarded a grant to develop its first hazard mitigation plan, or HMP. The City developed its first Hazard Mitigation Plan in 2005 because of increasing awareness that natural and man-made hazards, especially flood hazards, had the potential to affect the City and its citizens.

The original City of Texarkana Hazard Mitigation Plan was prepared in accordance with the process established in the February 26, 2002, FEMA Interim Final Rule (IFR). The process was also informed by the series of FEMA Mitigation Planning “How-To” Guides (series 386).

The 2005 version of Texarkana’s HMP established the City’s long-term strategy for reducing its risks from natural hazards. Texarkana’s first HMP was approved by the Texas Division of Emergency Management (TDEM) and FEMA on February 14, 2005. After FEMA and TDEM reviewed and approved the HMP, the Texarkana City Council formally adopted the original Plan on February 14th, 2005.

The 2005 HMP was prepared by a Hazard Mitigation Committee (HMC) composed of City staff from a variety of City offices and departments. Representatives from the Red Cross, the Texarkana Chamber of Commerce, neighborhood associations and the Arkansas-Texas Council of Governments (Urban/Regional Planning) also participated.

In 2010 a grant was awarded to the City of Texarkana to update its original Hazard Mitigation Plan. As was the case with many first-generation hazard mitigation plans, Texarkana’s 2005 HMP met FEMA requirements, but did not include enough details to be fully useful as a platform to implement more effective mitigation efforts. As part of the 2010-2011 Plan Update, certain elements of the original Plan were retained, while irrelevant or outdated information was summarized or removed. In accordance with FEMA guidance, the City of Texarkana elected to completely reformat its hazard mitigation plan as the basis for the 2010-2011 update.

The 2010-2011 update was completed using a similar process, as the 2005 update, with a Mitigation Planning Committee (MPC) that included representatives from numerous City departments, as well as a Stakeholders group. The MPC and the consultant hired by the City were responsible for completing the Plan update.

The original Hazard Mitigation Plan set the stage for long-term disaster resistance through identification of actions that would reduce the exposure of people and property to natural hazards. In the 2010-2011 update, the MPC reviewed all the actions from the original HMP, updated the actions status in the Mitigation Strategy and added new actions.

Preparing the 2023 Plan

The Hazard Mitigation Plan (HMP) was updated by the City of Texarkana, Texas Hazard Mitigation Planning Team (HMPT) under the direction and guidance of the City of Texarkana, Texas Office of Emergency Management (OEM) and Ark-Tex Council of Governments (ATCOG) who worked with the Texas Division of Emergency Management (TDEM) during the process. The Plan update was delayed due to changes in the structure of the Office of Emergency Management, personnel changes, and the COVID-19 Public Health Emergency.

The City of Texarkana’s HMP relied on the assistance of various public and private organizations to compile the data, maps, and other vital components of the plan. A range of stakeholders were invited and encouraged to participate in the development of the HMP. Stakeholder involvement was encouraged through notifications and invitations to agencies and individuals to participate. These included representatives from the City of Texarkana government, private sector businesses, voluntary agencies, citizens neighboring communities, and Bowie County. The City of Texarkana invited representatives of these various agencies to give feedback about the development of the plan. In addition to HMP meetings, the City of Texarkana encouraged open and widespread participation in the mitigation planning process through soliciting feedback through a hazard mitigation survey, the publication of newspaper notices promoting open public meetings. These media advertisements provided local officials, residents, businesses, academia, and other private interests in the City of Texarkana the opportunity to be involved and offer input throughout the local mitigation planning process.

The City of Texarkana believes that participation from all levels of government as well as public sector partners is of the utmost importance in hazard mitigation planning. In addition, the City of Texarkana involved their utility providers in the planning process. These utilities providers included Swepco Energy, Bowie-Cass Electric Coop, Inc., and Texarkana Water Utilities.

The HMPT was also tasked with including any external organizations that could benefit from the overall effectiveness of the plan. Their input is vital to the short-term and long-term success of the plan. External organizations include but are not limited to Texas Division of Emergency Management, the Federal Emergency Management Agency (FEMA), National Weather Service, local citizens, other businesses and industry, media outlets, the National Flood Insurance Program representatives, and others. These agencies and organizations were invited to public meetings, provided information for data collection, and provided feedback on documents throughout the planning process.

The plan is based on the data gathered and identified by all HMPT members, the public in an effort to prioritize mitigation projects in order of severity in an effort to reduce loss of property and life. The 2023 HMP provides a framework for:

- Short and long-term mitigation strategies
- Comprehensive goals and objectives
- Plan implementation and project approval
- Source Funding

Existing Data and Plans

Existing hazard mitigation information and other relevant Hazard Mitigation Plans were reviewed during the development of this plan. Data was gathered through numerous sources, including Geographic Information Systems (GIS). The intent of reviewing existing material was to identify existing data and information, shared objectives, and past and ongoing activities that can help inform the mitigation plan. It also helps identify the existing capabilities and planning mechanisms to implement the mitigation strategy. The table below outlines the sources used to collect data for the plan:

Data Source	Data Incorporation	Purpose
County appraisal data, census data, city land use data	Population and demographics	Population counts, parcel data, and land use data
National Centers for Environmental Information (NCEI)	Hazard occurrences	Previous occurrences and mapping for hazards
Texas Forest Service/Texas Wildfire Risk Assessment Summary Report	Wildfire threat and urban interface	Mapping and wildfire vulnerability
U.S. Army Corps of Engineers National Dam Inventory	Dam information	Dam list
Federal Emergency Management Agency (FEMA) Digital Flood Insurance Rate Map (DFIRM) Flood Zones, National Flood Insurance Program (NFIP) studies	Flood zone maps and NFIP information	GIS mapping of flood zones and NFIP data
October 2017 NFIP Flood Insurance Manual Change Package	NFIP Information	Repetitive Loss Properties and Community Rating System (CRS) ratings
State of Texas Hazard Mitigation Plan, 2018 editions	Hazards and mitigation strategy	Support the goals of the state
2011-2012 City of Texarkana HMP	All Chapters	This is an update of that plan
2022 Bowie County Hazard Mitigation Plan	All Chapters	Align the City hazards with the County hazards
Hazard Mitigation: Integrating Best Practices into Planning	Planning process	Use proven techniques in developing the HazMAP
Environmental Protection Agency (EPA) Superfund National Priority List	Protected sites	Risk assessment- identify critical areas
National Register of Historic Places	Historic districts	Risk assessment
FEMA National Risk Index	Risk index, expected annual loss, SVI, Community Resilience	Risk assessment
National Climate Change Assessment	Future threats	Future threats and mitigation measures
Texas Parks & Wildlife List of Rare Species	Endangered or protected species	Risk assessment
Texas Water Development Board	Lake information	Vulnerabilities
U.S. Department of Agriculture	Soil type	Expansive Soils description

The Hazard Mitigation Planning Team assisted in developing plan goals and action items by using their own skill sets and knowledge to create a more comprehensive plan. A variety of backgrounds and experience were evident in the team members, thus providing an eclectic view of mitigation needs and solutions.

Team meetings, telephone calls and e-mail communications played a role in team member contact and plan completion. Originally there were two kick-off meetings held on April 19, 2022 and May 17, 2022. An additional kick off meeting to explain the planning process with new team member Owen Jones was held on May 11, 2023.

Planning Team (HMPT)

Name	Position/Title
Tracey Litton	Deputy EMC (<i>Owen Jones is now the Deputy EMC</i>)
James Bramlett	Director of Administrative Services
Mashell Daniel	Director of Development Services
Jennifer Evans	City Secretary/Council Liaison
Vashil Fernandez	Director of Planning, Community Development and Health
Dustin Henslee	Assistant City Manager/Director of Public Works
David Orr	City Manager
Kristin Peoples	Chief Financial Officer
Robby Robertson	Director of Parks and Recreation
Lisa Thompson	External Affairs Officer
Eric Schlotter	Fire Chief/EMC (<i>Chris Black is now the Fire Chief/EMC for Texarkana, TX</i>)
Kevin Schutte	Assistant City Manager/Chief of Police
Gary Smith	Director of Texarkana Water Utilities
Brandon Uselton	Information Technology Manager
Owen Jones	Fire Inspector/Deputy EMC
Jeff Lewis	City Attorney

Team members provided a wealth of knowledge that was key in plan development. Input was given on Community Profile, Capability Assessment, Hazards of Concern and Mitigation Actions. Team members participated in face-to-face meetings as well as email and phone correspondence as needed.

A list of stakeholders was developed, and contacts were made by e-mail. In an effort to reach the widest audience possible, especially socially vulnerable populations, the City of Texarkana included the Housing Authority, ATCOG and the local American Red Cross in the stakeholder list. A draft of the plan was posted on the City of Texarkana website on March 14, 2024 and notices were sent to stakeholders on March 19, 2024.

Stakeholders

Organization Represented	Position	Contact
Housing Authority	Executive Director	Email
ATCOG	Executive Director	Email
Texarkana ISD	Superintendent	Email
Pleasant Grove ISD	Superintendent	Email
Liberty Eylau ISD	Superintendent	Email
Wadley Hospital	Director of Plant Operations	Email
Christus St. Michael Hospital	Emergency Preparedness Manager	Email
American Red Cross	Director	Email
Miller County	Judge	Email
Morris County	Judge	Email
Cass County	Judge	Email
Red River County	Judge	Email
Bi-State Justice	Manager	Email
SWEPCO Energy	Manager	Email
Bowie Cass Electric Coop, Inc.	Executive Director	Email
Texarkana Regional Airport	Emergency Manager	Email

No identified stakeholders provided comments to the email or posting notice.

Public Involvement Opportunities

An important component of the City of Texarkana’s community-based mitigation planning process involves public participation. Individual citizen involvement provides the HMPT with a greater understanding of local concerns and ensures a higher degree of mitigation success by developing community “buy-in” from those directly affected by the planning decisions of public officials.

Public input was sought by inviting participation by completing a short hazard mitigation survey at the beginning of the planning process. A public outreach flyer was passed out on June 9, 2022 and a poster was placed in City Hall on June 24, 2022. Post cards were passed out to community on June 24, 2022 as there was an article regarding the survey in the Texarkana Gazette on July 11, 2022.

The final draft plan was posted on the City of Texarkana website for general public review and comment on March 14, 2024. The City utilized a local newspaper, the Texarkana Gazette to provide notice of public comment on March 20, 2024 and March 24, 2024. Special Consideration was given to the socially vulnerable and underserved by sending information and link to plan to stakeholders who come in to contact with these populations. The intent was to provide these agencies with information to share with and/or provide feedback for the underserved and socially vulnerable communities. The Plan was also made available for review at OEM. This provided citizens with several opportunities to review the content of each of the Plan’s sections, to ask questions, and to suggest possible final revisions.

Informational Public Outreach flyer handed out at Employee/Community Wellness Fair on June 9, 2022. Flyer was also placed at the City Hall kiosk.



City of Texarkana, Texas
Office of Emergency Management

City of Texarkana, Texas

2022 Hazard Mitigation Plan Update

Every five years the City of Texarkana, Texas Office of Emergency Management (OEM) updates the Hazard Mitigation Plan (HMP). This HMP helps minimize risks to people, property, and the environment from natural, technological, and human-caused disasters in our community.

What is the All-Hazards Mitigation Plan (HMP)?
 The HMP is a comprehensive document that contains detailed information about the types of hazards we face, and the actions we can take before disaster strikes to reduce our vulnerability. Once the HMP is updated, reviewed, and approved by the Federal Emergency Management Agency (FEMA), the City is eligible to apply for FEMA mitigation grants:

- Hazard Mitigation Grant Program (HMGP)
- Building Resilient Infrastructures and Communities (BRIC)
- Flood Mitigation Assistance Program (FMA)

What Types of Hazards are Assessed?

What Types of Hazards are Assessed?		
Natural	Technological	Human-caused

Timeline
 The HMP Update is scheduled to be completed by the end of 2022. Texarkana’s Hazard Identification and Vulnerability Analysis was recently updated. Staff from various departments are working together to review the existing HMP and will work to incorporate the HMP into the capital improvement plan and other departmental plans throughout the City.



Input from stakeholders, neighboring communities, citizens, and businesses is needed and encouraged.

Questions or comments?
 Email:
TTFD-OEM@txkusa.org



Follow OEM on social media

[@TexarkanaOEM](#)

[@OEMTexarkana](#)

Online Hazard Mitigation Survey (posted on city website)



Hazard Mitigation Survey
Hazard Mitigation Survey
 Is your home or office building susceptible to damage from severe weather, wildfloods? Do you want to recover more quickly from disasters and prevent future damage from these and other hazards?

The City of Texarkana, Texas Office of Emergency Management is leading a project to update the City's Hazard Mitigation Plan. This plan identifies natural and human hazards throughout the City. It also presents an assessment of critical facilities vulnerable to these hazards. The new and updated plan will list potential actions to reduce risk and future damage.

Although the plan enables the City to be eligible for various assistance grants, the value really lies in the identification of hazards and helps the City and its residents better prepare for disasters.

* 1. How long have you lived in Texarkana, Texas?

Less than 1 year
 1 to 5 years
 6 to 9 years
 10 to 19 years
 20 years or more

* 2. Are you responding on behalf of a residential or commercial property?"

Residential
 Commercial

* 3. Do you own or rent your place of residence/business?

Own
 Rent

* 4. What is the Zip Code of your Primary residence?

* 5. How concerned are you about the following affecting our community?

	Not Concerned	Somewhat Concerned	Very Concerned
Dam/Levee Failure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drought and Water Shortage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Flood (Localized/Stormwater)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hailstorm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lightening	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tornado/Straight Line Wind	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Severe Weather: Extreme Heat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Severe Weather: Extreme Cold	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wildfire	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

* 6. How concerned are you about the following affecting our community?

	Not Concerned	Somewhat Concerned	Very Concerned
Agricultural Pests/Diseases	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pandemic/Epidemic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
HazMat Incident (Radiological, Chemical, Biological)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Transportation Accident (Airplane, Train, Vehicle)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Power/Utility Failure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Telecommunications (IT) Failure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Civil Disturbance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Terrorism	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

7. In the past 5 years, have you been affected by any of the above hazards?

Yes
 No

8. If yes, please list details of the hazard and how you were affected?

* 9. Natural and human-caused disasters can have a significant impact on a community but planning for these events can help lessen the impact. The following statement helps us determine community priorities in planning for these hazards. Please tell us how important each one is to you.

	Very important	Neutral	Not Important
Protecting private property	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Protecting critical facilities (hospitals, transportation networks, fire stations)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Preventing development of businesses and neighborhoods in hazard prone areas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Protecting natural environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Protecting historical/cultural landmarks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Promoting cooperation among public agencies, citizens, non-profit organizations and businesses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Protecting and reducing damage to utilities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Strengthening emergency services (police, fire, ambulance)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 10. What are the most effective ways for you to receive information about disaster preparedness? (Check all that apply.)

City Website
 Newspaper
 Social Media (Facebook, Twitter, Nextdoor, Instagram)
 Public Workshop/Class/Meeting
 Television / Radio
 Email
 Other (please specify)

* 11. Do you have flood insurance through the National Flood Insurance Program?

Yes
 No

* 12. If you do not have flood insurance, please select the reasons that may apply.

Affordability
 Property is not in a special flood hazard area
 Have never considered carrying flood insurance
 I feel my property is "High and Dry"

13. Enter contact information (Optional)

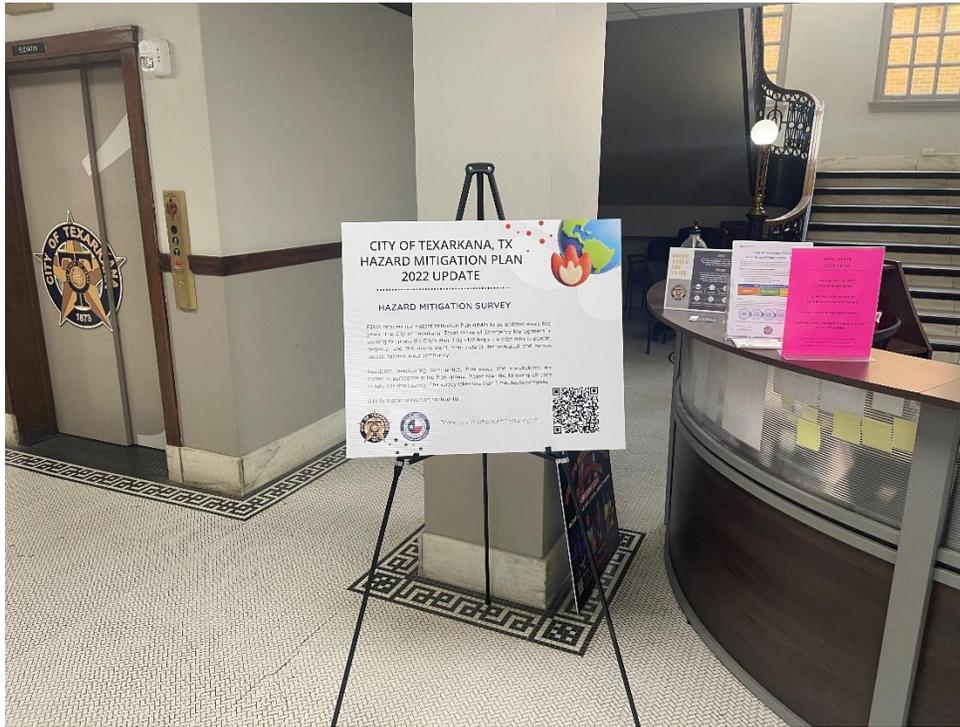
Name
 Company
 Address
 City/Town
 State/Province
 ZIP/Postal Code
 Email Address

Thank you for taking the time to participate in the City's Hazard Mitigation Plan Update.

Please return the form by emailing it to TTFD-OEM@txkusa.d

Dropping off or mailing the survey to:
 City of Texarkana, Texas
 Attention: Office of Emergency Management
 220 Texas Blvd.
 Texarkana, TX 75501

Hazard Mitigation Survey poster placed in City Hall foyer at kiosk on 06/24/2022.



06/24/2022 printed and passed out 250 QR code survey postcards to community.

**CITY OF TEXARKANA, TX
HAZARD MITIGATION PLAN
2022 UPDATE**

HAZARD MITIGATION SURVEY

FEMA requires our Hazard Mitigation Plan (HMP) to be updated every five years. The City of Texarkana, Texas Office of Emergency Management is working to update the City's Plan. This HMP helps minimize risks to people, property, and the environment from natural, technological and human caused hazards in our community.

Residents, neighboring communities, businesses and stakeholders are invited to participate in the Plan update. Please scan the following QR code to take this short survey. The survey takes less than 3 minutes to complete.

All information will remain confidential.

Thank you in advance for your input.

TEXARKANA GAZETTE ★ MONDAY, JULY 11, 2022

METRO/REGION 3A

Survey aims to improve local disaster readiness

GAZETTE STAFF

TEXARKANA, Texas — The city Office of Emergency Management is inviting the public to participate in a survey meant to improve disaster preparedness.

It is time for the city to update its Hazard Mitigation Plan, which the Federal Emergency Management Agency requires every five years, and public comments on the plan “are needed and encouraged,” according to a City Hall news release.

The plan addresses possible disasters that could cause loss of life and damage property, the economy and the environment in Texarkana and the surrounding region.

“Developing an updated HMP not only makes funding available to the City, but it also can increase public awareness, reduce loss of life and property in the event of a disaster, reduce future needs for response and recovery, limit business and economic interruption in the case of a disaster, and strengthen community partnerships,” the release stated.

To participate, visit ci.texarkana.tx.us/812/2022-Hazard-Mitigation-Plan-Update before August 8, 2022.

For questions or comments about Hazard Mitigation Planning, contact Tracey Litton at TTFD-OEM@txkusa.org or 903-798-3043.

Survey Results

There were 24 responses to the survey with over 60% of them being residents of Texarkana, Texas for 20 years or more. When asked about hazards of concern in the Texarkana community the majority indicated Drought, Flood, Hail, Lightning, Tornado, Severe Heat and Severe Cold. All of the hazards of concern from public survey were included in the plan update. 67% of respondents reported having been affected by some natural hazard in the past 5 years. 96% responded no to the question of having flood insurance through the National Flood Insurance Program (NFIP). The majority of those respondents listed that their property was not in a special flood hazard area as the reason.

Section 4: Hazard Identification and Risk Assessment

Overview of Risk Assessment Process

Hazard identification is recognizing risk-related events threatening a community. Events are described as natural or human-caused hazards inflicting harm on people or property or interfering with commerce or human activities. Such events would include, but are not limited to, floods, severe storms, winter weather, wildfire, drought, and other incidents affecting populated or built areas. Texarkana is susceptible to several possible natural hazards.



The City’s first Hazard Mitigation Plan approved in 2005, identified and profiled six hazards which included:

2005 Hazard Mitigation Plan
▪ Floods
▪ Severe thunderstorm/high winds
▪ Tornadoes
▪ Winter storm
▪ Drought
▪ Wildfire

The City’s 2012 Hazard Mitigation Plan update added the following hazards:

2012 Hazard Mitigation Plan
▪ Hailstorm
▪ Tropical storms and tropical cyclones
▪ Dam failure
▪ Seismic/earthquake
▪ Hazardous materials release (fixed site)
▪ Hazardous materials release (transportation)

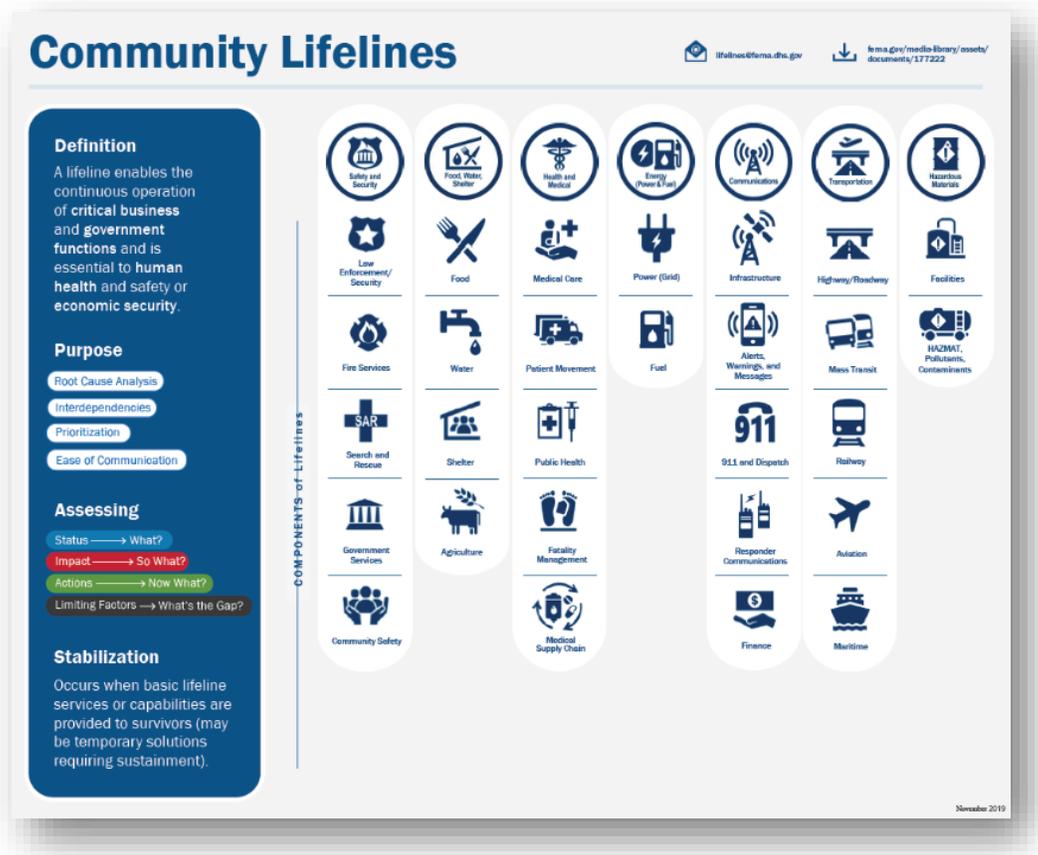
For the 2022-2023 Plan update, the City of Texarkana Hazard Mitigation Planning Team conducted a comprehensive hazard, risk, and vulnerability assessment of the City of Texarkana.

A risk assessment measures the potential loss of life, personal injury, economic injury, and property damage resulting from natural, human-caused, and technological hazards by assessing the vulnerability

of people, buildings, and infrastructure to natural, human-caused, and technological hazards. Several methods were used to identify risks to the community. These methods included:

- Evaluating historical data from scientific and news media sources
- Soliciting opinions and experiences from residents
- Aligning the City of Texarkana’s hazards with Bowie County’s hazards
- Surveying risks identified in the State of Texas Hazard Mitigation Plan that were pertinent to City of Texarkana
- Hazards identified in guidance provided by the FEMA Region VI Office

The HMPT was also asked to pay special attention to assets that fall into categories described as **Community Lifeline Components** to ensure consideration of the full range of critical services and assets that could be potentially at risk to one or more hazards. This need was driven home by the potential failure of all utility’s services (water, electricity, sewer, wastewater treatment, et. al.), transportation, communications, and other systems on which life depends for everyday survival. These services are listed as Community Lifeline Components in the FEMA graphic below.



The vulnerability assessment predicted the extent of damage that could result from a hazard of a given intensity in a given area on the existing and future build environment. Determining the community’s

vulnerability involved identifying threats posed to people, property, and the environment. This also included identifying critical facilities that could be affected by each hazard.

Changes from the 2012 Hazard Mitigation Plan

The prior plan did not address disease outbreak as a hazard of concern. In 2022, Bowie County, including the City of Texarkana, was hit with the COVID-19 pandemic. As of July 2023, there were 24,358 confirmed cases in Bowie County and 458 deaths associated with the virus. (uasfacts.org)

Through an assessment of previous federally declared disasters in Texas, the State of Texas Hazard Mitigation Plan, historical and potential events in Bowie County, and a review of available local mitigation action plans, it was determined that this Hazard Mitigation Plan (HMP) will address the risks associated with the following hazards:

Hazards Profiled in the 2023 Hazard Mitigation Plan

Hazard	Ranking
Flooding / River Flash Flood	1
Severe Winds (High Wind, Thunderstorm Wind, Strong Wind)	2
Tornadoes	3
Severe Winter Weather	4
Lightning	5
Hailstorms	6
Extreme Cold	7
Extreme Heat	8
Drought	9
Wildfire	10
Dam/Levee Failure	11
Infectious Disease	12

Identification of Hazards of Concern for the State of Texas

According to the 2023 SHMP, Texas experienced more natural disasters than almost any other state in the country. And, Texas has experienced the highest number of billion-dollar disasters and leads the United States total cumulative costs from disasters since 1980.

The hazards listed in the 2023 SHMP include: Coastal Erosion, Dam Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flood, Hailstorm, Hurricanes/Tropical Storms/and Depressions, Land Subsidence, Lightning, Severe Coastal Flood, Severe Wind, Severe Winter Weather, Tornado, and Wildfire.

Source: 2023 SHMP

According to the NOAA National Centers for Environmental Information (NCEI), between 1980 and 2022, Texas had the following billion-dollar disaster events: 18 Drought, 91 Severe Storm, 14 Tropical Cyclone, 9 Flooding, 9 Winter Storm, 7 Wildfire, and 1 Freeze.

Billion-dollar events to affect Texas from 1980 to 2022 (CPI-Adjusted)*

Disaster Type	Events	Events/Year	Percent Frequency	Total Costs	Percent of Total Costs
 Drought	18	0.4	12.1%	\$20.0B-\$50.0B [†]	8.6% [‡]
 Flooding	9	0.2	6.0%	\$10.0B-\$20.0B	3.9%
 Freeze	1	0.0	0.7%	\$500M-\$1.0B	0.1%
 Severe Storm	91	2.1	61.1%	\$50.0B-\$100.0B	18.0%
 Tropical Cyclone	14	0.3	9.4%	\$200.0B-\$220.0B	62.1%
 Wildfire	7	0.2	4.7%	\$2.0B-\$5.0B	0.8%
 Winter Storm	9	0.2	6.0%	\$20.0B-\$50.0B	6.4%
 All Disasters	149	3.5	100.0%	\$200.0B-\$360.0B[†]	100.0%[‡]

[†]Deaths associated with drought are the result of heat waves. (Not all droughts are accompanied by extreme heat waves.)
 Flooding events (river basin or urban flooding from excessive rainfall) are separate from inland flood damage caused by tropical cyclone events.
 The confidence interval (CI) probabilities (75%, 90% and 95%) represent the uncertainty associated with the disaster cost estimates. Monte Carlo simulations were used to produce upper and lower bounds at these confidence levels ([Smith and Matthews, 2015](#)).

Source: <https://www.ncei.noaa.gov/access/billions/events/TX/1980-2022>

Identification of Hazards of Concern for the City of Texarkana

The process for identifying hazards included looking at historical data to determine which hazards had a history of occurring in Bowie County and the City of Texarkana. Sources included, but were not limited to newspaper articles, general local knowledge of jurisdictions’ staff and local residents, NOAA Satellite and Information Service, National Climatic Data Center reports, the 2023 Texas State Hazard Mitigation Plan and advice from FEMA Hazard Mitigation Plan reviewers and the Texas Department of Emergency Management staff.

Hazards Identified in the 2023 Hazard Mitigation Plan for the City of Texarkana, Texas

Hazard	Included in SHMP	Description Why Included in City Plan
<p>Dam/Levee Failure</p> 	X	<ul style="list-style-type: none"> ▪ There are 22 dams in Bowie County, with 2 located in Texarkana. ▪ Bowie County has 5 levee systems which equates to 101 miles of levees. ▪ There is a levee system located in the county right outside the City limits. ▪ Flooding is a frequent issue requiring rescue and road closures. ▪ Due to the number of dams and levees located in and around the City, dam/levee can pose possible threats to life and property. ▪ A systematic failure of the dam structure resulting in the uncontrolled release of water, often resulting in floods that could exceed the 100-year flood plain boundaries.
<p>Drought</p> 	X	<ul style="list-style-type: none"> ▪ Bowie County was the subject of two disaster declarations for drought that occurred in 2015 and 2019. ▪ The County and City have been impacted by eight drought events of varied length since 2015. ▪ Due to the history of occurrence in the state and region and the impacts drought can have, drought was identified as a hazard of concern for the City of Texarkana.
<p>Extreme Cold</p> 		<ul style="list-style-type: none"> ▪ Extreme cold affects all regions of Texas. ▪ Winter storms are associated with extreme cold.
<p>Extreme Heat</p> 	X	<ul style="list-style-type: none"> ▪ Drought and Wildfire can accompany extreme heat. ▪ 34 events were reported between 01/01/2011 and 08/31/2022 ▪ Extreme heat is costly to the State, county, and City.
<p>Flooding (Riverine)</p> 	X	<ul style="list-style-type: none"> ▪ Flooding affects all regions of Texas. ▪ Bowie County contains many creeks, streams, and rivers. ▪ Texarkana has experienced flooding in the past. ▪ Based on the history of events and losses, riverine flooding was identified as a hazard of concern for the City of Texarkana.

<p><u>Hailstorms</u></p> 	<p>X</p>	<ul style="list-style-type: none"> ▪ This hazard affects all regions of Texas. ▪ Bowie County was not subject to a hail-related major disaster/emergency declaration; however, the City has been subject to several hail events since 2000. ▪ Frequency, past history and public concern support this hazard being profiled in the Texarkana plan.
<p><u>Lightening</u></p> 	<p>X</p>	<ul style="list-style-type: none"> ▪ Lightning occurs in every region of Texas. ▪ Although lightning has not been the direct cause of any Disaster Declarations, it can be very destructive. Lightning can cause injury and death and spark wildfire. It can also devastate buildings, critical facilities, and infrastructure. ▪ Lightning is a somewhat frequent occurrence in the City. However, based on available data, there have been only three reported events causing damage or casualties.
<p><u>Infectious Disease</u></p> 		<ul style="list-style-type: none"> ▪ The City has experienced three separate public health events between 2015. These includes include West Nile Virus, Zika Virus, and Coronavirus. ▪ At the time of this plan’s writing, Coronavirus continues to impact public health both locally and globally. ▪ The hazard was identified as a Hazard of Concern for the City of Texarkana.
<p><u>Severe Winds</u></p> 	<p>X</p>	<ul style="list-style-type: none"> ▪ This hazard affects all regions of Texas. ▪ Texarkana and Bowie County have regularly experienced strong winds. ▪ High winds accompany severe thunderstorms. ▪ Annual events in this region, sometimes multiple events in a year.
<p><u>Tornadoes</u></p> 	<p>X</p>	<ul style="list-style-type: none"> ▪ This hazard affects all regions of Texas. ▪ Bowie County has been the subject of two tornado-related FEMA disaster declarations since 1953. ▪ There have been two funnel clouds and seven tornadoes reported in the City since 1950, causing \$5.3 million in damage. ▪ The hazard was identified as a Hazard of Concern for the City of Texarkana.
<p><u>Wildfire</u></p> 	<p>X</p>	<ul style="list-style-type: none"> ▪ This hazard affects all regions of Texas. ▪ Due to the extent of development, there are only small, scattered areas of forest cover throughout the City. ▪ No wildfires have been reported in the City; however, due to the extreme drought across Texas, the City identified wildfires as a hazard of concern.
<p><u>Winter Storm</u></p> 	<p>X</p>	<ul style="list-style-type: none"> ▪ This hazard can affect any region of Texas. ▪ The County and City have been historically impacted by ice storms, freezing rain, winter storms, and heavy snow. ▪ The County and City have limited capabilities and equipment to combat ice and snow. ▪ Heavy psychological toll on population. ▪ Population not prepared for dealing with long-term outages etc. ▪ Winter Weather profile includes heavy snow, blizzards, and ice storms. This grouping is consistent with the State of Texas HMP.

Hazards Identified in the 2023 Texas State Hazard Mitigation Plan, Omitted from City Plan

Hazard	Included in SHMP	Reason for Exclusion
<p><u>Erosion (Coastal)</u></p> 	X	<ul style="list-style-type: none"> ▪ Due to its inland location, coastal erosion does not impact the City of Texarkana. ▪ Due to no history of occurrence in the City of Texarkana, coastal erosion is not identified as a hazard of concern for the City.
<p><u>Flooding (Coastal)</u></p> 	X	<ul style="list-style-type: none"> ▪ This hazard is caused by storm surge associated with hurricanes, and historically affects Regions 2, 3 and 6. ▪ Due to the City’s inland location, coastal flooding does not impact the City, therefore, coastal flooding is not identified as a hazard of concern for the City.
<p><u>Hurricanes, Tropical Storms, and Depressions</u></p> 	X	<ul style="list-style-type: none"> ▪ Due to the City’s inland location, Hurricanes, Tropical Storms and Depressions do not impact the City of Texarkana, therefore, will not be identified as a hazard of concern for the City.
<p><u>Land Subsidence</u></p> 	X	<ul style="list-style-type: none"> ▪ Not identified as a hazard of concern for the City: neither Bowie County nor the City of Texarkana have any history of land subsidence. ▪ According to the FEMA National Risk Index, subsidence could not be evaluated for risk as there was no reliable, nationwide dataset cataloging this type of hazard.
<p><u>Expansive Soils</u></p> 	X	<ul style="list-style-type: none"> ▪ Damage related to expansive soils will be addressed in the drought section.
<p><u>Earthquake</u></p> 	X	<ul style="list-style-type: none"> ▪ Texarkana, TX has a very low risk of earthquakes. There have been 0 earthquakes since 1931.

Major Disaster Declarations since 2012 HMP

The following table lists the major disaster declarations that have occurred in Texas since the approval of the City of Texarkana 2010-2011 HMP until 2023. *Disasters affecting Bowie County are highlighted in BLUE.*

Disaster	Event	Incident Period	Declared
DR-4705-TX	Texas Severe Winter Storm	January 30, 2023- February 2, 2023	April 21, 2023
FM-5444-TX	Texas Chalk Mountain Fire	July 18, 2022 – August 6, 2022	July 19, 2022
	Texas Exception Drought Disaster Declaration		July 8, 2022 Amended to include Bowie County August 5, 2022
FM-5443-TX	Texas Hard Castle Fire	July 7, 2022 – July 16, 2022	July 7, 2022
FM-5440-TX	Texas Mesquite Heat Fire	May 18, 2022 – May 29, 2022	May 18, 2022
FM-5429-TX	Texas Big L Fire	March 20, 2022 – March 30, 2022	March 20, 2022
FM-5428-TX	Texas Wheat Field Fire	March 17, 2022 – March 30, 2022	March 18, 2022
FM-5427-TX	Texas Kidd Fire	March 17, 2022 – March 17, 2022	March 17, 2022
FM-5422-TX	Texas North 207 Fire	December 15, 2021 – December 19, 2021	December 15, 2021
FM-5420-TX	Texas County Line Fire	December 10, 2021 – December 12, 2021	December 10, 2021
DR-4586-TX	Texas Severe Winter Storms	February 11, 2021 - February 21, 2021	February 19, 2021
EM-3554-TX	Texas Severe Winter Storm	February 11, 2021- February 21, 2021	February 14, 2021
DR-4572-TX	Texas Hurricane Laura	August 23, 2020 - August 27, 2020	December 9, 2020
EM-3540-TX	Texas Tropical Storms Marco & Laura	August 23, 2020 – August 27, 2020	August 24, 2020
DR-4485-TX	Texas Covid-19 Pandemic	January 20, 2020 and continuing	March 25, 2020
EM-3458-TX	Texas COVID-19	January 20, 2020 and continuing	March 13, 2020
DR-4466-TX	Texas Tropical Storm Imelda	September 17, 2019 - September 23, 2019	October 4, 2019
DR-4454-TX	Texas Severe Storms and Flooding	June 24, 2019 - June 25, 2019	July 17, 2019
DR-4416-TX	Texas Severe Storms and Flooding	September 10, 2018 - November 2, 2018	February 25, 2019
DR-4377-TX	Texas Severe Storms and Flooding	June 19, 2018 - July 13, 2018	July 06, 2018

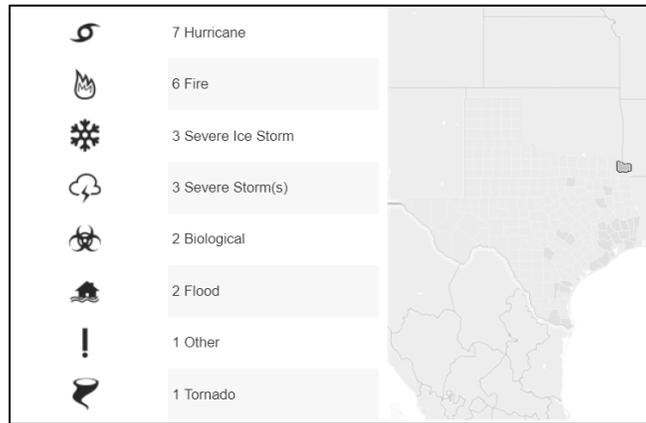
TEXARKANA HAZARD MITIGATION PLAN UPDATE 2024

Disaster	Event	Incident Period	Declared
DR-4332-TX	Texas Hurricane Harvey	August 23, 2017 - September 15, 2017	August 25, 2017
DR-4272-TX	Texas Severe Storms and Flooding	May 22, 2016 - June 24, 2016	June 11, 2016
DR-4269-TX	Texas Severe Storms and Flooding	April 17, 2016 - April 30, 2016	April 25, 2016
DR-4266-TX	Texas Severe Storms, Tornadoes, and Flooding	March 07, 2016 - March 29, 2016	March 19, 2016
DR-4255-TX	Severe Winter Storms, Tornadoes, Straight-line Winds, and Flooding	December 26, 2016 - January 21, 2016	February 09, 2016
DR-4245-TX	Texas Severe Storms, Tornadoes, Straight-line Winds, and Flooding	October 22, 2015 - October 31, 2015	November 25, 2015
DR-4223-TX	Texas Severe Storms, Tornadoes, Straight-line Winds, and Flooding	May 04, 2015 - June 22, 2015	May 29, 2015
DR-4159-TX	Texas Severe Storms and Flooding	October 30, 2013 - October 31, 2013	December 20, 2013
DR-4136-TX	Texas Explosion (West, TX Fertilizer)	April 17, 2013 - April 20, 2013	August 02, 2013
EM-3363-TX	Texas Explosion	April 17, 2013 - April 20, 2013	April 19, 2013
FM-2976-TX	Texas Livermore Ranch Fire Complex	April 30, 2012	April 30, 2012
	USDA Statewide Drought	2012 - 2014	Counties in Texas were under an ongoing USDA Secretarial Drought Disaster Declaration
DR-4029-TX	Texas Wildfires	August 30, 2011 - December 31, 2011	September 9, 2011
DR-1999-TX	Texas Wildfires	April 6, 2011 - August 29, 2011	July 1, 2011
**Disasters affecting Bowie County are highlighted in BLUE.			

Data Source: FEMA

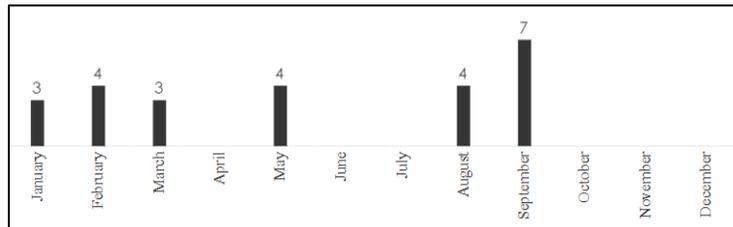
FEMA Declarations by Hazard Type for Bowie County, Texas

Texas has had 371 disasters since 1953, with 25 federal disaster declarations declared in Bowie County. The disasters include hurricanes, fires, severe ice storms, severe storms, biological disaster, floods, and tornadoes.



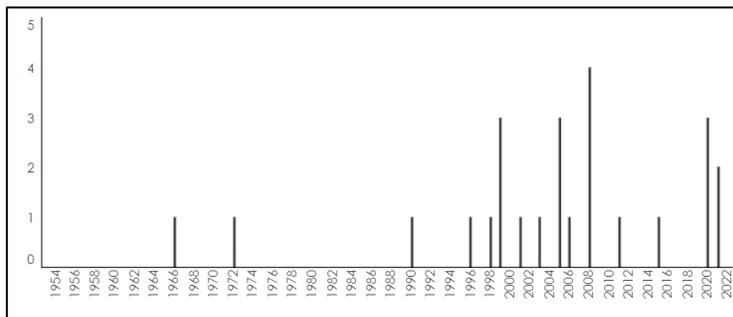
Source: FEMA Data Visualizations Page

Historically, disasters have occurred in Bowie County mostly in September. Several disaster events have also taken place in August, May, February, January, and March.



Source: FEMA Data Visualizations Page

Disasters occurring in Bowie County have occurred in the following years:



Source: FEMA Data Visualizations Page

Determining Risk

The following tables represent the factors used to calculate overall risk in Franklin County or in the participating jurisdictions.

Severity x .45 + Probability x .30 + Warning Time x .15 + Duration x .10 = Risk

Potential Severity of Impact: (45% of Priority Risk Index)	
SUBSTANTIAL Index Value = 4	<ul style="list-style-type: none"> • Possible fatalities • Complete shutdown of facilities for 30 days or more • More than 50 percent of property destroyed or with major damage
MAJOR Index Value = 3	<ul style="list-style-type: none"> • Possible permanent disability from injuries and illnesses • Complete shutdown of critical facilities for at least 2 weeks • More than 25 percent of property destroyed or with major damage
MINOR Index Value = 2	<ul style="list-style-type: none"> • Injuries and/or illnesses do not result in permanent disability • Complete shutdown of critical facilities for more than 1 week • More than 10 percent of property destroyed or with major damage
LIMITED Index Value = 1	<ul style="list-style-type: none"> • Injuries and/or illnesses are treatable with first aid • Shutdown of critical facilities and services for 24 hours or less • Less than 10 percent of property destroyed or with major damage

Probability of Future Events: (30% of Priority Risk Index)	
Highly Likely Index Value = 4	Event probable in the next year 1/1 = 1.00 (Greater than .33)
Likely Index Value = 3	Event probable in next 3 years 1/3 = .33 (Greater than 0.20, but less than or equal to 0.33)
Occasional Index Value = 2	Event probable in next 5 years 1/5 = 0.20 (Greater than 0.10, but less than or equal to 0.20)
Unlikely Index Value = 1	Event probable in next 10 years 1/10 = 0.10 (0.10 or less)

Formula for probability: # events divided by the # of years on record i.e. 10 flood events in a 20-year period would give a 10/20 = .50 Value index of 4 (Highly Likely)

Warning Time: (15% of Priority Risk Index)	
Index Value = 4	Less than 6 hours
Index Value = 3	6 to 12 hours
Index Value = 2	12 to 24 hours
Index Value = 1	More than 24 hours

Duration: (10% of Priority Risk Index)	
Index Value = 4	More than a week
Index Value = 3	Less than a week
Index Value = 2	Less than 24 hours
Index Value = 1	Less than 6 hours

Priority Risk Index (PRI)

High Risk	PRI of 3.0 or greater
Medium Risk	PRI score 2.0 to 3.0
Low Risk	PRI score less than 2.0

PRI Value = (Impact x .45%) + (Probability x 30%) + (Warning Time x 15%) + (Duration x 10%)

Vulnerability is categorized as “Low” to “High”. These terms are defined as follows:

Vulnerability	
LOW	Limited or no history of significant impacts to property, infrastructure and/or public safety.
MODERATE	People and facilities located in areas that have low levels of historic occurrence of impacts from hazard and/or in areas where impact is possible but not probable.
HIGH	People and facilities located in areas that have previously experienced impacts from hazards and/or in areas where impacts from hazards are possible and probable. Future damage to property and infrastructure is probable and/or a documented history of threat to public safety exists.

PROPRTY DAMAGE ASSESSMENT

The following damage assessment tables are used to estimate monetary loss due to natural hazards in the City of Texarkana, Texas

Texarkana				
Structure Type	\$ Value	75%	50%	25%
Residential	\$1,240,920,865	\$930,690,649	\$620,460,433	\$310,230,216
Commercial	\$505,717,477	\$379,288,108	\$252,858,739	\$126,429,369
Industrial	\$27,211,162	\$20,408,372	\$13,605,581	\$6,802,791
Exempt Property	\$137,376	\$103,032	\$68,688	\$34,344
Totals	\$1,773,986,880	\$1,330,490,160	\$886,993,440	\$443,496,720

Hazard Assessment Elements

The Hazard Profiles, found in the following sections, were prepared for each identified natural hazard, and assess the hazard per the following seven elements.

1. **Description:** Information provided about the hazards likely to affect the city.
2. **Location:** Geographic area affected by each natural hazard.
3. **Extent:** Range of anticipated intensities of the identified hazard.
4. **Previous Occurrences:** Describes the hazard in terms of what, when, and where past events have occurred and the extent of damages.
5. **Probability of Future Occurrences:** Describes the likelihood of the hazard occurring or reoccurring within the city.
6. **Vulnerability:** Describes which assets, including structures, systems, populations and other assets as defined by the community, within location identified to be hazard prone, are at risk from the effects of the hazard.
7. **Impact:** Describes the consequences or effects of each hazard on the assets identified in the vulnerability assessment.
8. **Mitigation Ideas:** Provides a list of possible Mitigation Actions.

HAZARD ANALYSIS

Simply put, hazard analysis is an evaluation of the types of hazards (emergencies) that have occurred in the past or could occur in the future, identification of the population at risk, and an evaluation of the hazards versus the population to determine overall vulnerability.

The following steps were taken:

- ❑ Identification of the Hazards. Determination of the hazards, both natural and technical, that could affect the city.
- ❑ Profiling the Hazard Events. Determination of how bad a hazard can get.
- ❑ Inventorying Assets. Determination of where and/or to what extent the hazards can affect the assets of the city.
- ❑ Estimating Losses. Determining how the hazards will affect the city.

Hazard Summary

Natural Hazard	Impact	Probability of Future Events	Level of Risk	Team Risk Ranking
Dam/Levee Failure	Limited	Unlikely	Low	11
Drought	Substantial	Highly Likely	High	9
Extreme Cold	Minor	Highly Likely	Medium	7
Extreme Heat	Limited	Highly Likely	Medium	8
Flooding / River Flash Flood	Limited	Occasional	Low	1
Hailstorms	Limited	Highly Likely	Medium	6
Infectious Disease				12
Lightning	Limited	Highly Likely	Medium	5
Severe Winds (High, Thunderstorm, Strong)	Minor	Highly Likely	Medium	2
Severe Winter Weather	Minor	Highly Likely	Medium	4
Tornadoes	Substantial	Highly Likely	High	3
Wildfire	Substantial	Highly Likely	High	10

FEMA National Risk Index

The FEMA National Risk Index is an online mapping application that visualizes natural hazard risk metrics based on 18 natural hazards, expected annual losses from natural hazards, social vulnerability, and community resilience. With this tool, a holistic view of community risk to natural hazards can be determined.

The National Risk Index can support prioritizing resilience efforts by providing an at-a-glance overview of multiple risk factors. The Index can assist communities in:

- Updating emergency operations plans
- Enhancing hazard mitigation plans
- Prioritizing and allocating resources
- Identifying the need for more refined risk assessments
- Encouraging community-level risk communication and engagement
- Educating homeowners and renters
- Supporting the development and adoption of enhanced codes and standards
- Informing long-term community recovery

The National Risk Index is intended to inform risk-based decision making while increasing risk awareness. While this tool can be one source of information to support risk reduction investments, other information and tools (e.g., a benefit-cost analysis or local knowledge) should also be considered.

Based on the data from the FEMA National Risk Index, the Texarkana Community has an overall **Relatively Moderate to Relatively Low** risk rating, based on the Census tract location within the City.

National Risk Index for Texarkana based on Census Tracts



Risk Index Legend

- Very High (Red)
- Relatively High (Light Red)
- Relatively Moderate (Yellow)
- Relatively Low (Light Blue)
- Very Low (Dark Blue)
- No Rating (White)
- Not Applicable (Light Gray)
- Insufficient Data (Dark Gray)

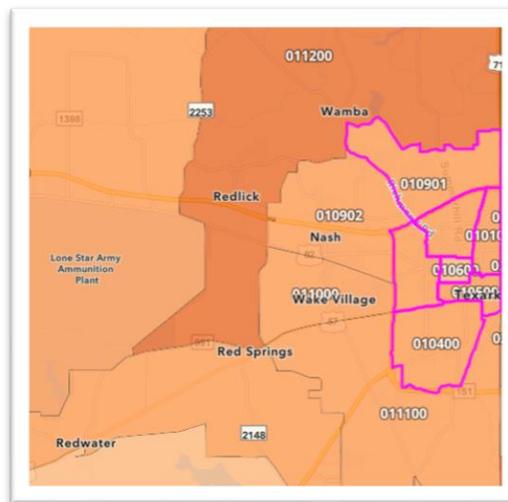
Hazard Type Risk Index scores are calculated using data for only a single hazard type and reflect a community's relative risk for only that hazard type. The table below lists the hazard type, along with the risk index score for the City of Texarkana. Risk levels can vary depending on Census tract location within the City.

National Risk Index for Texarkana, risk based on Census Tracts

Hazard Type	Risk Index for the City of Texarkana
Drought	Very Low, No Rating
Hail	Very High, Relatively High
Heat Wave	Relatively High, Relatively Moderate
Ice Storm	Very High, Relatively High
Lightning	Relatively Low, Very Low
Riverine Flooding	Relatively Moderate, Relatively Low, Very Low
Strong Wind	Relatively High, Relatively Moderate, Relatively Low
Tornado	Very High, Relatively High, Relatively Moderate
Wildfire	Very Low, No Rating
Winter Weather	Relatively High, Relatively Moderate

Based on the Risk Data, overall, Texarkana has a **Relatively Low** expected annual loss in all Census tracts.

Expected Annual Loss for Texarkana



Hazard Type	Expected Annual Loss for Hazard Types
Avalanche	Not Applicable
Coastal Flooding	Not Applicable
Cold Wave	No Expected Annual Losses
Drought	Very Low, No Expected Annual Losses
Earthquake	Relatively Low, Very Low
Hail	Very High, Relatively High
Heat Wave	Relatively High, Relatively Moderate
Hurricane	Very Low
Ice Storm	Very High, Relatively High
Landslide	Relatively Low, No Expected Annual Losses
Lightning	Relatively Low, Very Low
Riverine Flooding	Relatively Low, Very Low
Strong Wind	Relatively High, Relatively Moderate, Relatively Low
Tornado	Very High, Relatively High, Relatively Moderate
Tsunami	Not Applicable
Volcanic Activity	Not Applicable
Wildfire	Very Low, No Expected Annual Losses
Winter Weather	Relatively High, Relatively Moderate

Social Vulnerability measures the susceptibility of social groups to the adverse impacts of natural hazards, including disproportionate death, injury, loss, or disruption of livelihood. Social Vulnerability is unique to a geographic location and can vary from being **Relatively High to Relatively Low**, depending on the Census tract location within the City.

Social Vulnerability for Texarkana



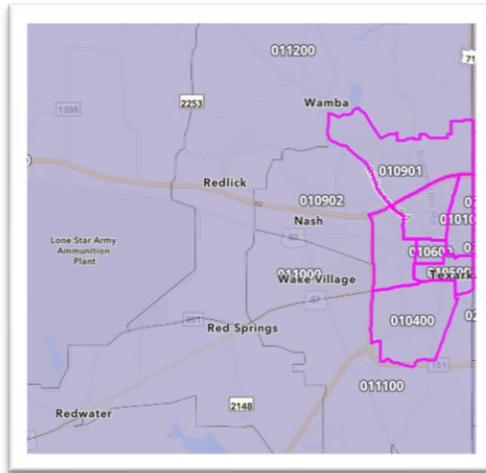
Social Vulnerability Legend

- Very High
- Relatively High
- Relatively Moderate
- Relatively Low
- Very Low
- Data Unavailable

Community Resilience measures a community's ability to prepare for anticipated natural hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions.

Based on the National Risk Index by FEMA, Texarkana has a **Relatively High** Community Resilience Score.

Texarkana Community Resilience Score



Community Resilience Legend

- Very High
- Relatively High
- Relatively Moderate
- Relatively Low
- Very Low
- Data Unavailable

Data Source: FEMA National Risk Index

Dam/Levee Failure

Description

A dam is any artificial dike, levee or other barrier, together with appurtenant works, which is constructed for the purpose of impounding water on a permanent or temporary basis, that raises the water level five feet or more above the usual, mean, low water height when measured from the downstream toe-of-dam to the emergency spillway crest or, in the absence of an emergency spillway, the top-of-dam. Dams generally serve the primary purpose of retaining water, while other structures such as floodgates or levees (also known as dikes) are used to manage or prevent water flow into specific land regions.

Dam failures are not themselves natural hazards but are often caused by natural hazards such as floods and earthquakes, and their failure can then result in floods. Dam failures can result from a variety of causes including lack of maintenance, seismic activity, improper design or construction, or the effects of large storms. Significant rainfall can quickly inundate an area and cause floodwater to overwhelm a reservoir. If the spillway of the dam cannot safely pass the resulting flows, water will begin flowing in areas not designed for such flows and failure may occur.

As of December 2023, the U.S. Army Corp of Engineer’s (USACE) National Inventory of Dams (NID) database indicates that there were 22 dams in Bowie County. Dams are typically ranked by hazard classification, which is determined by the potential for infrastructure and property damage downstream if a dam failure were to occur. The three hazard classifications include high hazard, significant, and low and are defined as follows:

FEMA Dam Classifications

Hazard Potential Classification	Loss of Human Life	Economic, Environmental, Lifeline Losses
LOW	None expected	Dams assigned the low hazard potential classification are those where failure or mis operation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property
SIGNIFICANT	None expected	Dams assigned the significant hazard potential classification are those dams where failure or mis-operation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.
HIGH	Probable, one or more expected	Dams assigned the high hazard potential classification are those where failure or mis-operation will probably cause loss of human life.

Location

According to the National Inventory of dams, there are currently 7,384 dams in Texas, with the average dam age of 59 years. 80 percent are classified as high hazard potential dams with an EAP, 2 percent are federally regulated dams, and 55 percent are state-regulated dams. Of the 22 dams classified in Bowie

County, four are high hazard dams. Two dams are located near the City of Texarkana. These are the Wright Patman Dam and Lake (high hazard) dam, and the Bringle Lake Dam (low hazard).

The Wright Patman Dam and Lake is located on the Sulphur River (river mile 44.5) about nine miles southwest of Texarkana, Texas. The lake extends throughout portions of Bowie, Cass, Morris, Titus, and Red River Counties. The dam is maintained by the USACE – Fort Worth District. It is 18,500 feet in length (approximately 3.5 miles) and 106 feet high. The Wright Patman Dam is designed for the retention of floodwater from the Sulphur River. The dam is a multi-purpose flood control lake with a conservation pool storage capacity of 145,300 acre-feet and flood control pool storage capacity of 2,509,000 acre-feet (one acre-foot is one acre of water one foot deep, or about 326,000 gallons.). The NID indicates that the Wright Patman Dam was last inspected on March 15, 2022. Bringle Lake is designated as a recreational facility – the dam is 850 feet long, and 33 feet high.

Source: <https://www.swf-wc.usace.army.mil/wrightpatman/Information/index.asp>

Table of Bowie County Dams

Dam Name	River or Stream Name	Last Inspection Date	Owner Types	Dam Height (Ft)	Dam Length (Ft)	Max Storage (Acre-Ft)	Year Completed	Hazard Potential Classification	Purposes
Bringle Lake Dam	CLEAR CREEK	5/15/2008	Local Government – City of Texarkana	33	850	5000	1929	Low	Recreation; Water Supply
Wright Patman Dam (Lake Texarkana Dam)	SULPHUR RIVER	3/15/2022	Federal	106	18640	6505000	1954	High	Fish and Wildlife Pond; Recreation; Water Supply; Flood Risk Reduction
<i>Confidential – Dam in Texarkana</i>		4/5/2016	Private	13.5	700	87	1965	High	Other
<i>Confidential – Dam in Texarkana</i>		4/5/2016	Private	17.8	400	77	1965	High	Other
<i>Confidential – Dam in Texarkana</i>		4/5/2016	Private	16.2	360	47	1965	High	Other
T and P Lake Dam	TR-RICE CREEK		Local Government – City of New Boston	10	570	76	1915	Low	Recreation; Water Supply
Hatchel Farm Lake Dam	HOLLY CREEK	7/26/1990	Private	16	1320	1000	1956	Low	Irrigation; Recreation

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Dam Name	River or Stream Name	Last Inspection Date	Owner Types	Dam Height (Ft)	Dam Length (Ft)	Max Storage (Acre-Ft)	Year Completed	Hazard Potential Classification	Purposes
Malta Farm Lake Dam No 2	DANIELS CREEK	7/30/1985	Private	20	1700	520	1950	Low	Irrigation; Recreation
De Kalb Lake Dam	TR-YOUNG CREEK		Private	26	750	260	1961	Low	Fire Protection, Stock, Or Small Fishpond
Smith Club Dam	TR-BLACK BOTTOM		Private	16	330	77	1950	Low	Fire Protection, Stock, Or Small Fishpond
Ashford Lake Dam	TR-ANDERSON CREEK		Private	23	415	200	1960	Low	Fire Protection, Stock, Or Small Fishpond
Pecos Crow Ranch Dam	TR-LITTLE CREEK		Private	17	729	208	1987	Low	Other
Anderson Lake Dam	TR-DANIELS CREEK		Private	18	0	300	1962	Low	Other
Kennedy Dam	CRUTCHERS CREEK	7/31/1985	Private	14	660	350	1927	Low	Irrigation; Recreation; Fire Protection, Stock, Or Small Fishpond
Elkins Lake Dam	TR-YOUNG CREEK		Private	12	422	110	1960	Low	Fire Protection, Stock, Or Small Fishpond
Gifford-Hill Dam	TR-DAYS CREEK		Private	13	900	73	1930	Low	Recreation
Crystal Springs Dam	TR-MOSS CREEK		Private	18	600	136	1947	Low	Recreation
Malta Farm Lake Dam No 1	OFF CH-MUD CREEK	7/30/1985	Private	12	13850	1334	1956	Low	Irrigation
Elliott Creek (Reservoir)	Elliott Creek	10/1/2019	Federal – RRAD. Redwater	44	1850	1928	1942	Low	Recreation
Caney Creek (Reservoir)	Caney Creek	10/31/2019	Federal – RRAD. Redwater	30	2575	1820	1942	Low	Water Supply
Dam At Hle	TRIBUTARY OF AKIN CREEK	0019-08-11	Private	19	400	71	2005	Low	
Wright Lake Dam	TR-MCKINNEY BAYOU		Private	18	485	100	1930	Low	Recreation

Data Source: National Inventory of Dams

For dams with a maximum storage capacity of 100,000 acre-feet or more, all census blocks within five miles were considered to be at risk to potential dam failure hazards. For dams with a maximum storage capacity between 10,000 and 100,000 acre-feet, all census blocks within three miles were considered at risk to potential dam failure hazards. For dams with a maximum storage capacity of less than 10,000 acre-feet, all census blocks within one mile were considered to be at risk to potential dam failure hazards. Exact dam inundation maps are not available to the public- thus the following information is merely as estimation. For specific information, please contact the dam owners.

It is each dam owner’s responsibility to ensure that their dam follows the Texas Commission on Environmental Quality’s (TCEQ) regulations regarding emergency action plans. Additionally, each dam owner required to have an emergency action plan must know and be prepared to take the actions outlined in their emergency action plan, should their dam begin to fail.

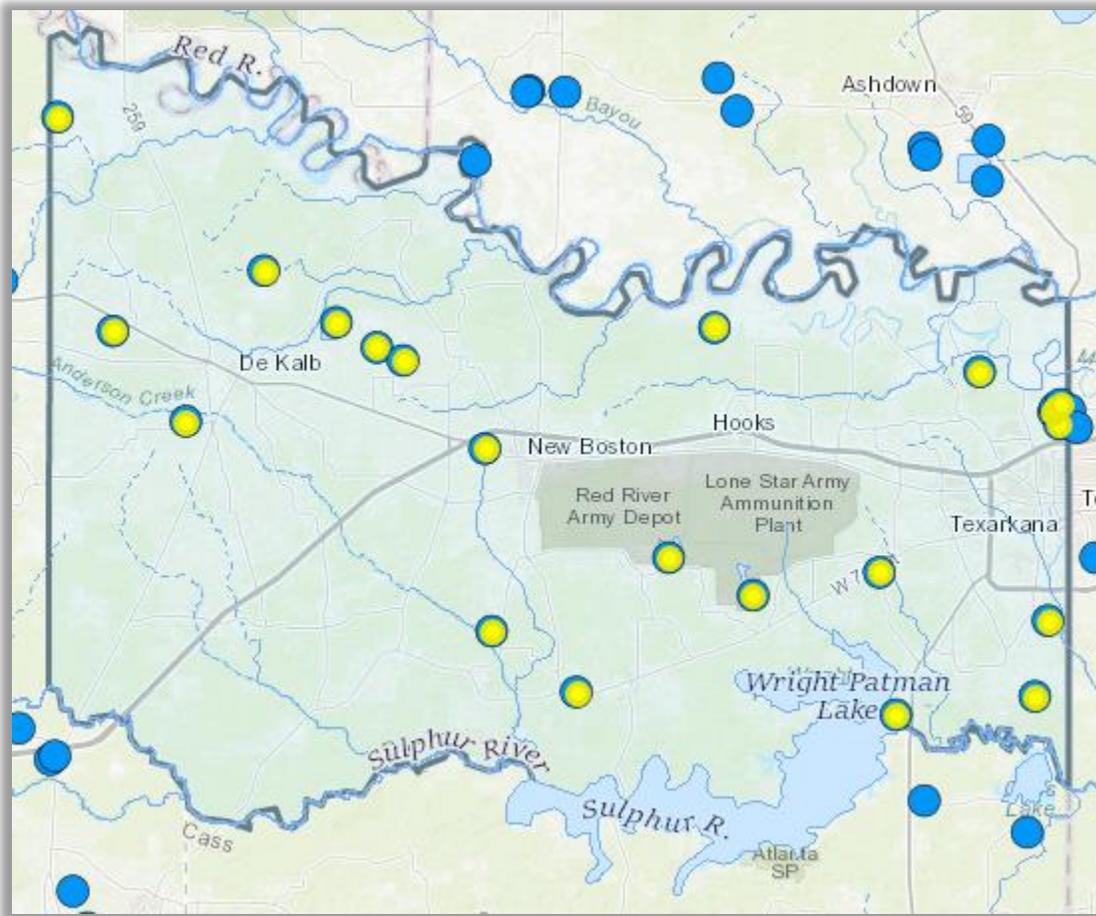
Local emergency management is only responsible for the impact of flooding from dam failure on surrounding areas. The responsibility for maintaining a safe dam rests with its owner. Dam owners are also responsible for maintaining safety *at* and *around* their dam. Dam owners are the only ones who can directly maintain the dams and implement mitigation and safety measures on the structures.

Responsible Parties	Dam Related Safety Activities
Dam Owners/Operators	<ul style="list-style-type: none"> • Identification of emergency at dam • Initial notifications • Implementation of repairs • Security and technical assistance on site
Local Emergency Management and Local Responders	<ul style="list-style-type: none"> • Public warning • Possible evacuation • Shelter plan activated • Rescue and recovery • State of Emergency declaration • Termination of emergency status
State Emergency Management	<ul style="list-style-type: none"> • Aid affected area when requested • Coordinate specialized assistance • Notify appropriate state agencies • Determine who does what in an emergency

Sources: *Dam Ownership Fact Sheet 2018, Texas Commission on Environmental Quality*

The map below identifies the locations of the dams in Bowie County. The map indicates that two dams have the potential to impact the City of Texarkana if a failure were to occur. The Wright Patman Dam and Lake near the City of Texarkana is located along the Sulphur River. Wright Patman Lake is the primary source of drinking water for the City. The cities of Texarkana, Texas and Texarkana, Arkansas are authorized to divert 14,572 acre-feet of water annually for municipal use. The lake is the largest in the State in terms of flood control capacity.

Dams in Bowie County

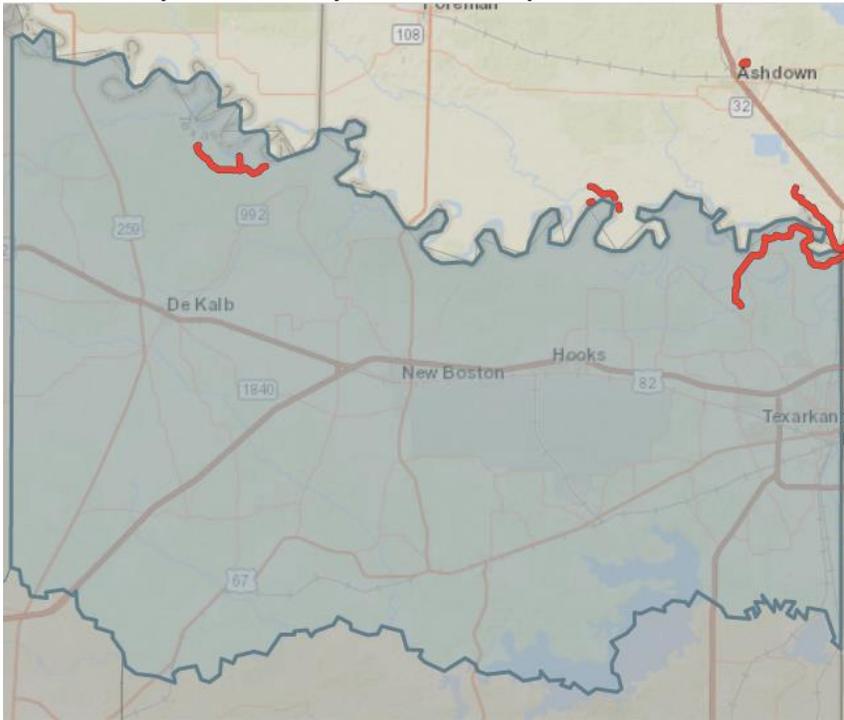


Map Source: nid.sec.usace

DAM FAILURE RISK					
COMMUNITY	POTENTIAL IMPACT 45%	PROBABLITY 30%	Warning 15%	Duration 10%	RISK
City of Texarkana	Limited PRI=1	Unlikely PRI=1	< 6 hours PRI=1	< 6 hours PRI=1	Low 1.45

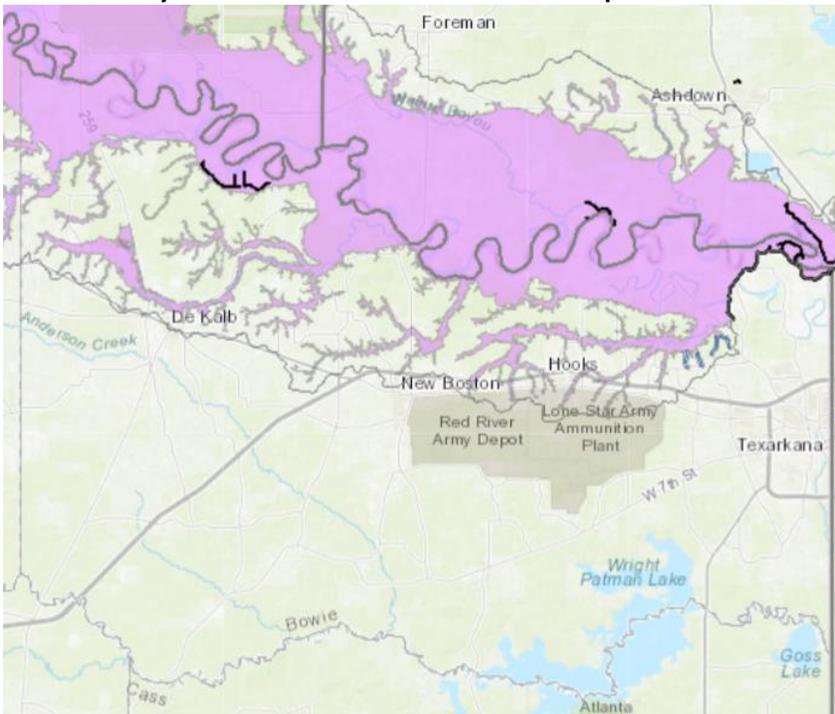
Levee System in Bowie County

Bowie County has 5 levee systems which equals to 101 miles of levees



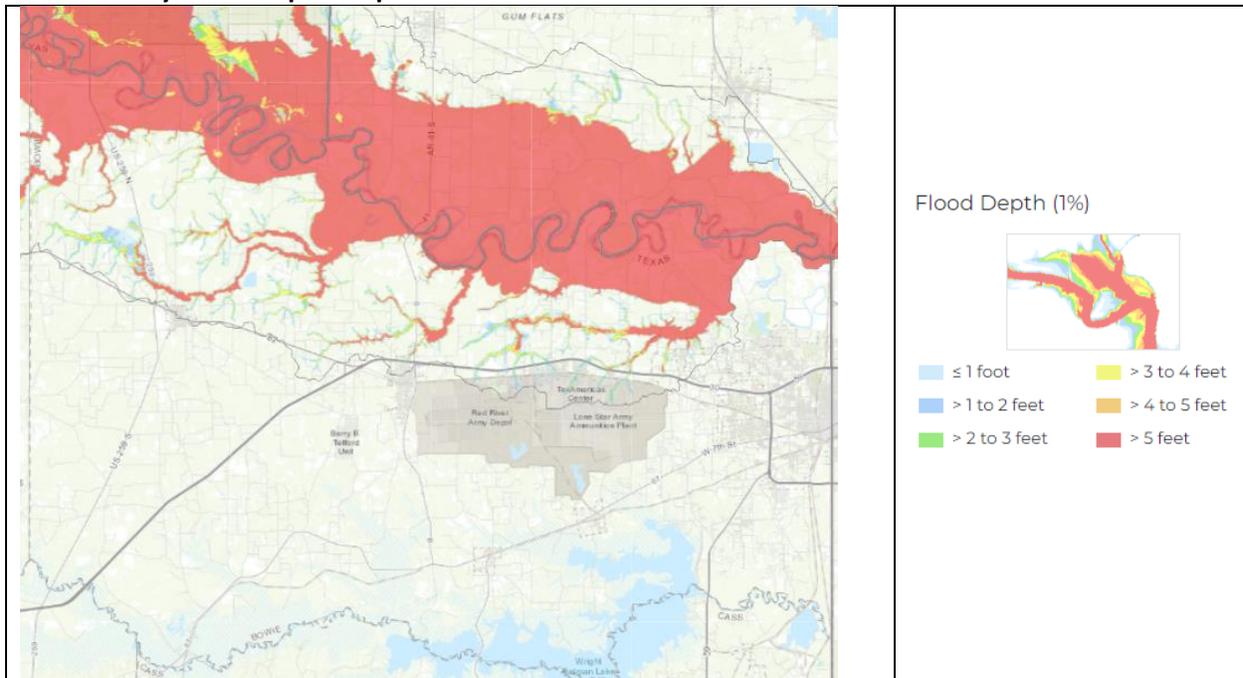
Source: <https://levees.sec.usace.army.mil/#/>

Bowie County Estimated Base Flood Elevation Map



Source: <https://webapps.usgs.gov/infrm/estBFE/>

Bowie County Flood Depth Map



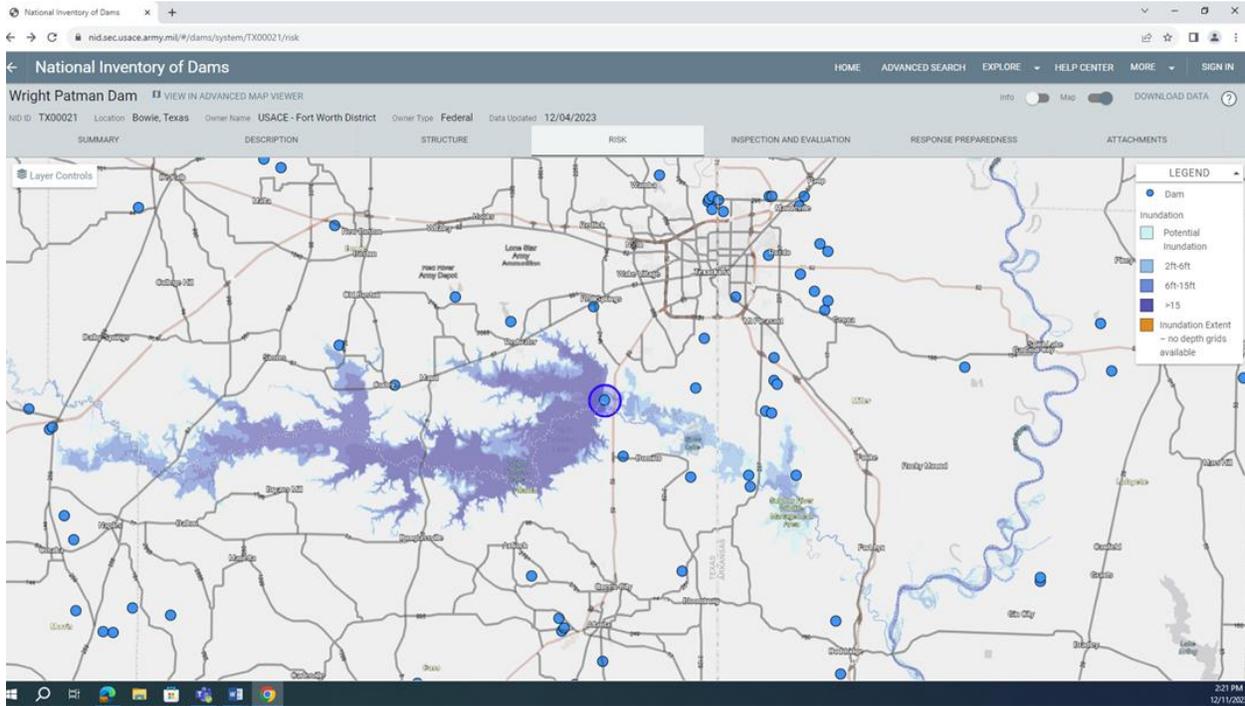
Source: <https://webapps.usgs.gov/infrm/estbfe/>

Extent (Severity)

The severity of a dam failure event depends on several factors, including the size of the dam, the extent of the failure (i.e., catastrophic structural failure versus a small breach), the velocity of the floodwater released, and the density of built environment and populations downstream. There is the potential for total collapse of a dam, but less significant failures are more likely as a result of overtopping (inadequate spillway design, debris blockage), foundation defects, or seepage. Overtopping of a dam during a flood event due to clogged debris has the potential to be catastrophic. As mentioned above, dams are typically categorized into three hazard classifications: high, significant, and low hazard. There are currently no engineering studies available to indicate the exact areas of potential inundation during dam failure scenarios, but it is assumed that the flatness of the landscape suggests that escaping water would not likely cause any significant damage. According the National Inventory of Dams inundation map on page 86, the depth of water resulting from a dam failure could be between 6 and 15 feet.

Although Wright Patman Dam reduces the risk of flooding to downstream communities, the dam does not eliminate the risk of flooding. The most likely scenario that could result in downstream flooding are high volume releases from Wright Patman Dam through the un-gated spillway during high water events. These surcharge operational releases occur when reservoir's flood storage capacity is exceeded and excess water flows through the spillway. Wright Patman Dam is designed to reduce the peak flooding levels downstream without risking the structural integrity of the dam. (Source: *National Inventory of Dams*)

Wright Patman Dam Inundation Map



Previous Occurrence

A review of current literature and open data sources revealed no known past dam failures in or near the City of Texarkana or Bowie County.

Probability of Future Occurrence

Based on no past dam failures in the City, the probability of future failures is projected to be low. USACE completed a risk assessment in 2022 and classified the risk associated with Wright Patman Dam as very low. This risk classification is primarily driven by the very low probability for dam failure and the number of large populations at risk below Wright Patman Dam.

Dam safety is increasingly subjected to the influence of climate change. Its impacts must be assessed through the integration of the various effects acting on each aspect, considering their interdependencies, rather than just a simple accumulation of separate impacts. (doaj.org)

Vulnerability

According to the Texas Dam Safety Program, heavy rains after a severe drought leave earthen dams vulnerable.

Impact

Potential impacts from dam failure include:

- Property and crop damage
- Transportation delays
- Injury or death
- Train derailment

The hazard extent rating scale for dam failure is based on the amount of potential damage that can be caused by a failure. For the purposes of this hazard analysis, damage from dam failure only takes into account areas where developed property is affected.

Although dam failures have the potential to cause extensive damage, there have been no recorded failures in the City of Texarkana, as a wide array of measures, including maintenance, are taken to ensure structural integrity. The effects of climate change, changes in population and changes in land development are not expected to affect the impact of a dam failure event.

DAM/LEVEE FAILURE RISK					
COMMUNITY	POTENTIAL IMPACT 45%	PROBABLITY 30%	Warning 15%	Duration 10%	RISK
City of Texarkana	Limited PRI=1	Unlikely PRI=1	< 6 hours PRI=4	< 24 hours PRI=2	Low 1..55

Mitigation Project Ideas

The United States Corps of Engineers (USACE) and the Texas Commission on Environmental Quality (TCEQ) have dam failure training available for jurisdictional staff, to help reduce the impact of flooding from a dam failure to the jurisdiction. *Source: FEMA Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards*

Drought (Dust Storm)

Description

A drought is a period of unusually constant dry weather that persists long enough to cause deficiencies in water supply (surface or underground). Droughts are slow-onset hazards, but, over time, they can severely affect crops, municipal water supplies, recreational resources, and wildlife. If drought conditions extend over a number of years, the direct and indirect economic impacts can be significant. High temperatures, high winds, and low humidity can worsen drought conditions and also make areas more susceptible to wildfire. In addition, human actions and demands for water resources can accelerate drought-related impacts.

Droughts can be classified as agricultural, ecological, hydrological, meteorological, and socioeconomic. The table below presents definitions for these different types of droughts.

Drought Classification and Definitions

Agricultural Drought		When crops become affected by drought.
Ecological Drought		When natural ecosystems are affected by drought.
Hydrological Drought		When low water supply becomes evident in the water system.
Meteorological Drought		When dry weather patterns dominate an area.
Socioeconomic Drought		When the supply and demand of various commodities is affected by drought.

Source: <https://www.drought.gov/what-is-drought/drought-basics>

In Texas, local governments are empowered to take action on behalf of those they serve. When drought conditions exist, a burn ban can be put in place by a county judge or county Commissioners Court prohibiting or restricting outdoor burning for public safety.

Location

Droughts occur regularly throughout Texas; however, they can vary greatly in their intensity and duration. Drought is not a location-specific hazard so it can equally affect all areas of the City of Texarkana.

Extent (Severity)

According to the U.S. Drought Monitor, Droughts are classified in the following categories:

Category	Description	Possible Impacts	Ranges				
			Palmer Drought Severity Index (PDSI)	CPC Soil Moisture Model (Percentiles)	USGS Weekly Streamflow (Percentiles)	Standardized Precipitation Index (SPI)	Objective Drought Indicator Blends (Percentiles)
D0	Abnormally Dry	Going into drought: <ul style="list-style-type: none"> short-term dryness slowing planting, growth of crops or pastures Coming out of drought: <ul style="list-style-type: none"> some lingering water deficits pastures or crops not fully recovered 	-1.0 to -1.9	21 to 30	21 to 30	-0.5 to -0.7	21 to 30
D1	Moderate Drought	<ul style="list-style-type: none"> Some damage to crops, pastures Streams, reservoirs, or wells low, some water shortages developing or imminent Voluntary water-use restrictions requested 	-2.0 to -2.9	11 to 20	11 to 20	-0.8 to -1.2	11 to 20
D2	Severe Drought	<ul style="list-style-type: none"> Crop or pasture losses likely Water shortages common Water restrictions imposed 	-3.0 to -3.9	6 to 10	6 to 10	-1.3 to -1.5	6 to 10
D3	Extreme Drought	<ul style="list-style-type: none"> Major crop/pasture losses Widespread water shortages or restrictions 	-4.0 to -4.9	3 to 5	3 to 5	-1.6 to -1.9	3 to 5
D4	Exceptional Drought	<ul style="list-style-type: none"> Exceptional and widespread crop/pasture losses Shortages of water in reservoirs, streams, and wells creating water emergencies 	-5.0 or less	0 to 2	0 to 2	-2.0 or less	0 to 2

Source: US Drought Monitor

Drought is monitored nationwide by the National Drought Mitigation Center (NDMC). Indicators are used to describe broad scale drought conditions across the U.S. Indicators correspond to the intensity of drought. Based on the historical occurrences for drought and the location of the City of Texarkana can anticipate a range of drought from abnormally dry or D0 to exceptional or D4 based on the Palmer Drought Category.

Previous Occurrence

According to the National Centers for Environmental Information (NCEI) storms database, 37 events were reported in Bowie County between 01/01/2011 and 08/31/2023 (4626 days)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
BOWIE (ZONE)	BOWIE (ZONE)	TX	08/01/2022	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	07/21/2022	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	03/01/2022	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	02/01/2022	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	01/06/2022	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	12/01/2021	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	11/30/2021	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	09/17/2019	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	08/01/2018	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	12/01/2017	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	11/09/2017	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	12/01/2016	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	11/01/2016	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	10/25/2016	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	10/01/2015	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	09/01/2015	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	08/18/2015	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	09/01/2013	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	08/01/2013	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	01/01/2013	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	12/01/2012	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	11/01/2012	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	03/01/2012	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	02/01/2012	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	01/01/2012	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	12/01/2011	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	11/01/2011	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	10/01/2011	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	09/01/2011	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	08/01/2011	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	07/01/2011	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	06/01/2011	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	05/01/2011	00:00	CST-6	Drought		0	0	0.00K	0.00K

TEXARKANA HAZARD MITIGATION PLAN UPDATE 2024

BOWIE (ZONE)	BOWIE (ZONE)	TX	04/01/2011	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	03/01/2011	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	02/01/2011	00:00	CST-6	Drought		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	01/01/2011	00:00	CST-6	Drought		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

There have been at least three major U.S. droughts in the last 100 years. Two of these, the 1930s Dust Bowl drought and the 1950s drought, each lasted 5-7 seven years and covered large areas of the country with significant impacts. Although hurricanes and tornadoes are more dramatic, droughts are among the costliest weather-related events and the most far reaching. *Source: <https://www.weather.gov/safety/drought>*

A drought is one of the most complex of natural hazards: it is difficult to determine its precise beginning or end; its impact on farming is enormous, often killing crops, edible plants, and -- in severe cases -- trees; and it can increase the risk of wildfire as dry vegetation serves as an easy-to-ignite fuel.

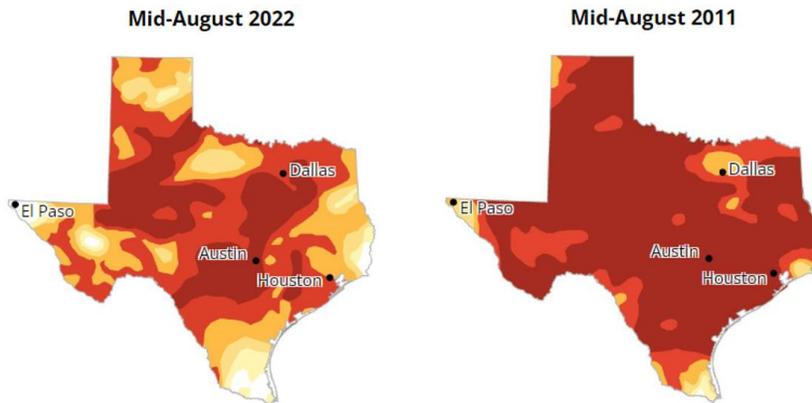
Since 2000, the longest duration of drought (D10D4) in Texas lasted 271 weeks, beginning May 4, 2020, and ending on July 7, 2015. The most intense period of drought occurred the week of October 4, 2011, where D4 affected 87.99% Texas land. *Source: 2023 SHMP*

As of August 2022, there are 92,565 people in Bowie County affected by drought. August 2022 has been the 9th driest June on record, over the past 128 years. Down 2.96 inches from normal. 26th driest year to date over the past 128 years (January-June 2022) 6.01 inches down from normal. (*drought.gov*)

2022 has been the worst drought year in Texas since 2011. Almost the entire state of Texas is experiencing a severe level of drought. According to the U.S. Drought Monitor, about 27% of the state is under an “exceptional drought,” the most severe category, and about 62% is under an “extreme drought,” the second-highest classification. While the state is seeing some pockets of rain in August, it is being predicted that the drought will likely extend into winter because of current climate patterns that could lead to hotter and drier weather.

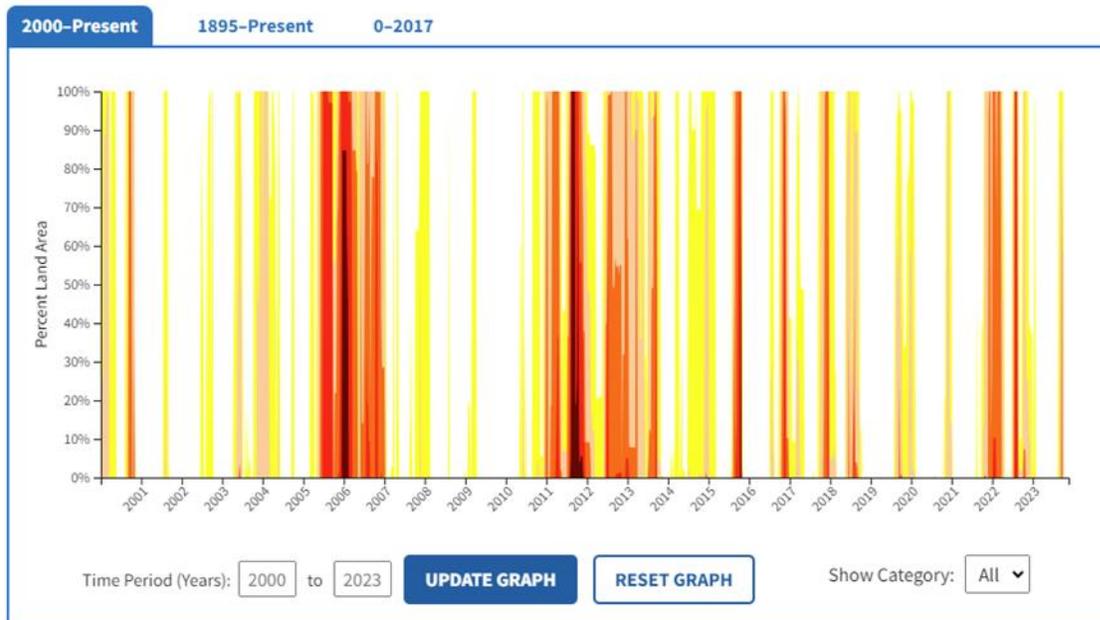
More than a quarter of Texas currently faces exceptional drought conditions, compared with almost three quarters during the same time period in 2011.

Drought Across Texas Comparison between Mid-August 2022 vs. Mid-August 2011



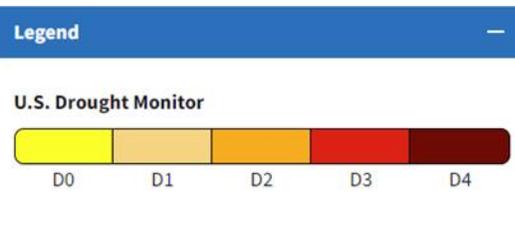
Source: US Drought Monitor

According to the National Weather Service, parts of the state are seeing temperatures similar to those during Texas’ 2011 drought, the driest year on record in the state, but there has been more rainfall this year than in 2011, Nielsen-Gammon said. The weather service said the average rainfall in Texas in 2011 was 14.89 inches. The previous record of 14.99 inches of average rainfall was set in 1917. The average temperature in 2011 was 67.2 degrees. The warmest year on record was 1921, when the average temperature was 67.5 degrees, the weather service said.



The U.S. Drought Monitor (2000–present) depicts the location and intensity of drought across the country. Every Thursday, authors from NOAA, USDA, and the National Drought Mitigation Center produce a new map based on their assessments of the best available data and input from local observers. The map uses five categories: Abnormally Dry (D0), showing areas that may be going into or are coming out of drought, and four levels of drought (D1–D4). [Learn more.](#)

LATEST AVAILABLE DATA: 2023-11-21



Data Source: drought.gov

DROUGHT RISK					
COMMUNITY	POTENTIAL IMPACT 45%	PROBABLITY 30%	Warning 15%	Duration 10%	RISK
City of Texarkana	Substantial PRI=4	Highly Likely PRI=4	> than 24 hours PRI=1	>Week PRI=4	High 3.55

Probability of Future Occurrence

Droughts will continue to occur in Bowie County and the City of Texarkana when the conditions are right. It is a normal, recurrent feature of climate. A drought will affect Bowie County and the City of Texarkana. Historically, a drought can last from a few days to several months. According to FEMA National Risk Index the risk for drought in Bowie County is relatively low.

Climate change has further altered the natural pattern of droughts, making them more frequent, longer, and more severe. Since 2000, the western United States is experiencing some of the driest conditions on record. The southwestern U.S. is going through an unprecedented period of extreme drought. This will have lasting impacts on the environment and those who rely on it. (ww.usgs.gov)

Vulnerability

The region is vulnerable when there is a deficiency of precipitation over an extended period. All of Bowie County is vulnerable to drought. For the City of Texarkana droughts have a social dynamic that includes affecting the elderly and young, causing depression, creating job loss, requiring residents to move due to economic impact and rising costs for food.

Impact

Potential impacts from drought include:

- Property damage
- Loss of water supply
- Increases grassfire potential and intensity
- Negative impact on citizens, to include water restrictions and lack of drinkable water supply
- Impact on car washes, parks, and pools
- Impact on crops, livestock, and natural vegetation
- Increase in food prices
- Dust storms, leading to transportation accidents
- Natural environments damage, to include protected species and critical habitats
- Pipeline damage

Drought’s consequences are far-reaching, impacting water quality, public health, the economy, the natural environment, public infrastructure, and more. Understanding drought’s potential impacts enables drought planners and decision makers to better address those impacts and, ultimately, improve their communities’ preparedness to cope with drought. The effects of climate change, changes in population and changes in land development are not expected to affect the impact of a drought event.

No two states experience the same set of impacts during a drought. According to the U.S. Drought Monitor, drought impacts for the State of Texas include the following impacts:

Category	Historically observed impacts
D0	Producers begin supplemental feeding for livestock
	Planting is postponed; forage germination is stunted; hay cutting is reduced
	Grass fires increase
	Surface water levels decline
D1	Dryland crops are stunted
	Early cattle sales begin
	Wildfire frequency increases
	Stock tanks, creeks, streams are low; voluntary water restrictions are requested
D2	Pasture conditions are very poor
	Soil is hard, hindering planting; crop yields decrease
	Wildfire danger is severe; burn bans are implemented
	Wildlife moves into populated areas
	Hydroelectric power is compromised; well water use increases; mandatory water restrictions are implemented
D3	Soil has large cracks; soil moisture is very low; dust and sand storms occur
	Row and forage crops fail to germinate; decreased yields for irrigated crops and very large yield reduction for dryland crops are reported
	Need for supplemental feed, nutrients, protein, and water for livestock increases; herds are sold
	Increased risk of large wildfires is noted
	Many sectors experience financial burden
	Severe fish, plant, and wildlife loss reported
D4	Water sanitation is a concern; reservoir levels drop significantly; surface water is nearly dry; river flow is very low; salinity increases in bays and estuaries
	Exceptional and widespread crop loss is reported; rangeland is dead; producers are not planting fields
	Culling continues; producers wean calves early and liquidate herds due to importation of hay and water expenses
	Seafood, forestry, tourism, and agriculture sectors report significant financial loss
	Extreme sensitivity to fire danger; firework restrictions are implemented
	Widespread tree mortality is reported; most wildlife species' health and population are suffering
	Devastating algae blooms occur; water quality is very poor
	Exceptional water shortages are noted across surface water sources; water table is declining
Boat ramps are closed; obstacles are exposed in water bodies; water levels are at or near historic lows	

Data Source: <https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?TX>

Types of Drought Impacts

Drought can lead to a wide range of environmental, social, and economic impacts; both short-term and long-term.

Agriculture: Drought can reduce the water availability and quality necessary for productive farms, ranches, and grazing lands. It can also contribute to insect outbreaks, increases in wildfire, and altered rates of carbon, nutrient, and water cycling—impacting agricultural production and critical ecosystem services.

Transportation: Drought impacts port and waterway transportation and supply chains, resulting in increased transportation costs. Higher temperatures that coexist with drought can impact roads, airport runways, and rail lines.

Wildfire: Drought can be a contributing factor to wildfire. Dry, hot, and windy weather combined with dried out (and more flammable) vegetation can increase the probability of large-scale wildfires.

Public Health: Drought can cause significant human health outcomes, including decreased water quantity and quality, increased incidence of illness and disease (e.g., Valley Fever), adverse mental health outcomes as livelihoods are challenged, and overall, increased mortality rates.

Ecosystems: Drought can alter or degrade critical functions of healthy ecosystems, including reduced plant growth, reduction or extinction of local species, and landscape-level transitions (e.g., a forest being replaced by a grassland).

Water Quality: During drought, decreased water levels, warmer temperatures, and soil runoff can lead to algal growth, lower dissolved oxygen levels, and increased turbidity, posing health risks for human and aquatic life.



Water Conservation Ideas

- Capture water while washing hands or waiting for shower water to warm and use the captured water for watering plants or a garden.
- Repair leaks in plumbing or faucets.
- Install low-flow fixtures/appliances, low-volume toilets, or retrofit existing faucets with flow restrictors.
- Compost food scraps rather than putting them in the garbage disposal.
- Plant native or drought-tolerant plants on your property.
- Harvest rainwater.
- Water plants and gardens by hand or choose water-efficient irrigation systems with a smart, weather-based controller and check the systems regularly to be sure they are watering plants, not pavement.
- Reduce the amount of fertilizer you use as it increases the amount of water needed.
- Mow lawns at three inches or higher to encourage grass to root more deeply and hold soil moisture.
- Mulch your garden to help the soil retain moisture and keep weeds at bay.
- Keep your pool covered to minimize water evaporation.
- Take shorter showers.
- Only use the laundry machine or dishwasher when they are full and use water-saving features.
- Wash your car at a car wash that recycles water or wash it less often or not at all.

Source: <https://education.nationalgeographic.org/resource/mapmaker-drought-index>



Benefits of Xeriscaping

Water conservation: Xeriscaping is key for water conservation: Native plants (plants specifically adapted to your region, climate, and soil type) require much less water.

Saves money: Xeriscaping can reduce your water bill by up to 80 percent and can decrease your yearly lawn maintenance costs by a whopping 87 percent.

Gives you access to financial incentives: Many local governments offer rebates and bill reductions for homeowners who choose to xeriscape.

Attracts future buyers: Xeriscaping can increase your property value by 14 percent, and it's growing in popularity as a more sustainable type of landscaping.

Saves time: Xeriscaping means less watering, mowing, and weeding, so you can relax and do what you love over the weekend.

Promotes biodiversity: As many native animals and insects face habitat loss, your xeriscape can be the home and food source they need. Native plants attract beautiful pollinators like butterflies, bees, and birds, so you'll soon have a colorful show in your own backyard.

Extends the life of water resources infrastructure: When you use less water, you help preserve the quality of reservoirs, water treatment plants, and aquifers.

Reduces or eliminates chemical needs: Native plants used in xeriscapes are specially adapted to your region, so you won't need to apply fertilizer or harmful pesticides.

Decreases energy use and pollution: The energy needed to treat water, power a lawn mower, and manufacture fertilizer puts a strain on the environment and stresses your local ecosystem.

Gorgeous and fun to garden: Xeriscapes are great for conserving water and energy, but they're also simply beautiful.

Source: lawnlove.com

Mitigation Project Ideas:

- Assess vulnerability to drought risk
- Monitor drought conditions
- Monitor water supply
- Plan for drought
- Require water conservation during drought conditions
- Retrofit water supply systems
- Enhance landscaping and design measures - Xeriscaping
- Educate residents on water saving techniques
- Educate farmers on soil and water conservation practices
- Purchase crop insurance

Source: FEMA Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards

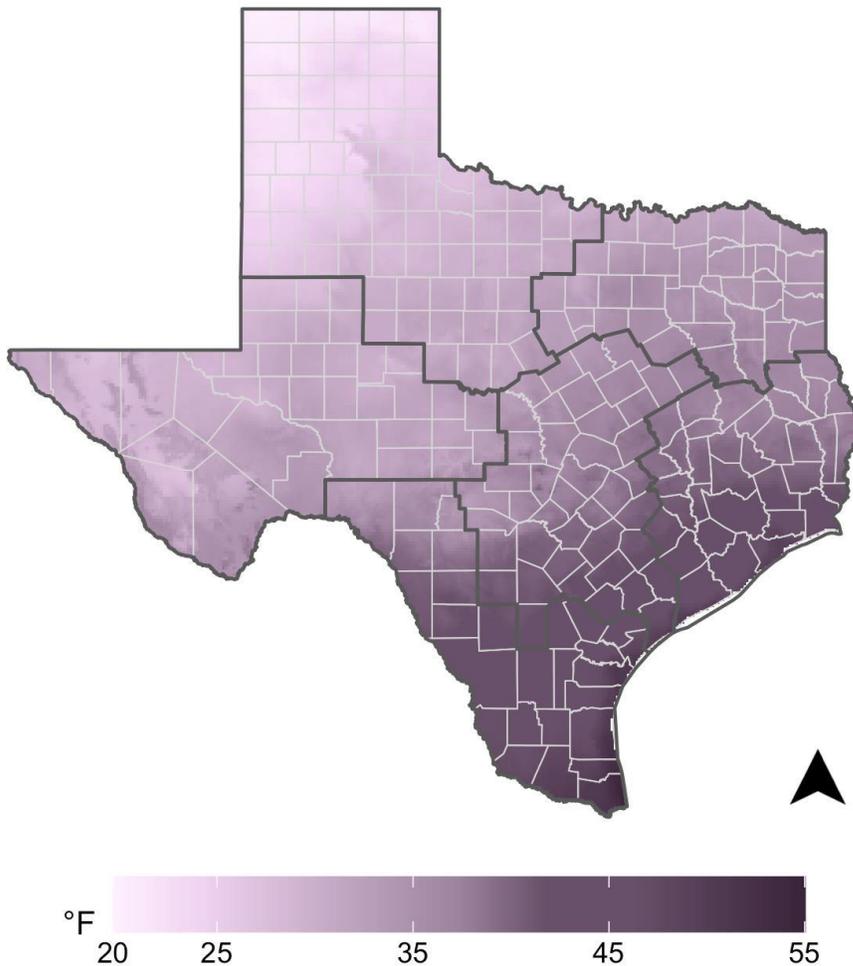
Extreme Cold (Wind Chill)

Description

Extreme cold can happen anywhere in the State of Texas, although its levels can range extensively. Extreme cold that damages citrus crops can accompany severe winter storms, but it can also be independent of those storms. For this reason, the impacts of extreme cold are presented here separately from the impacts of the severe winter (snow, sleet, freezing rain, or a mix of these wintry forms of precipitation) discussed in the Section for Severe Winter Weather. Fatalities can result from extreme temperatures, as they can push the human body beyond its limits.

The passage of a winter cold front with a drastic drop in temperature heralds the arrival of a cold wave, usually referred to as a “blue norther.” The map below shows expected annual minimum temperatures across the State of Texas. When dealing with the impacts of these temperatures on people, it is important to consider the wind-chill effect, shown on the table below this map.

Annual Minimum January Temperatures in Texas

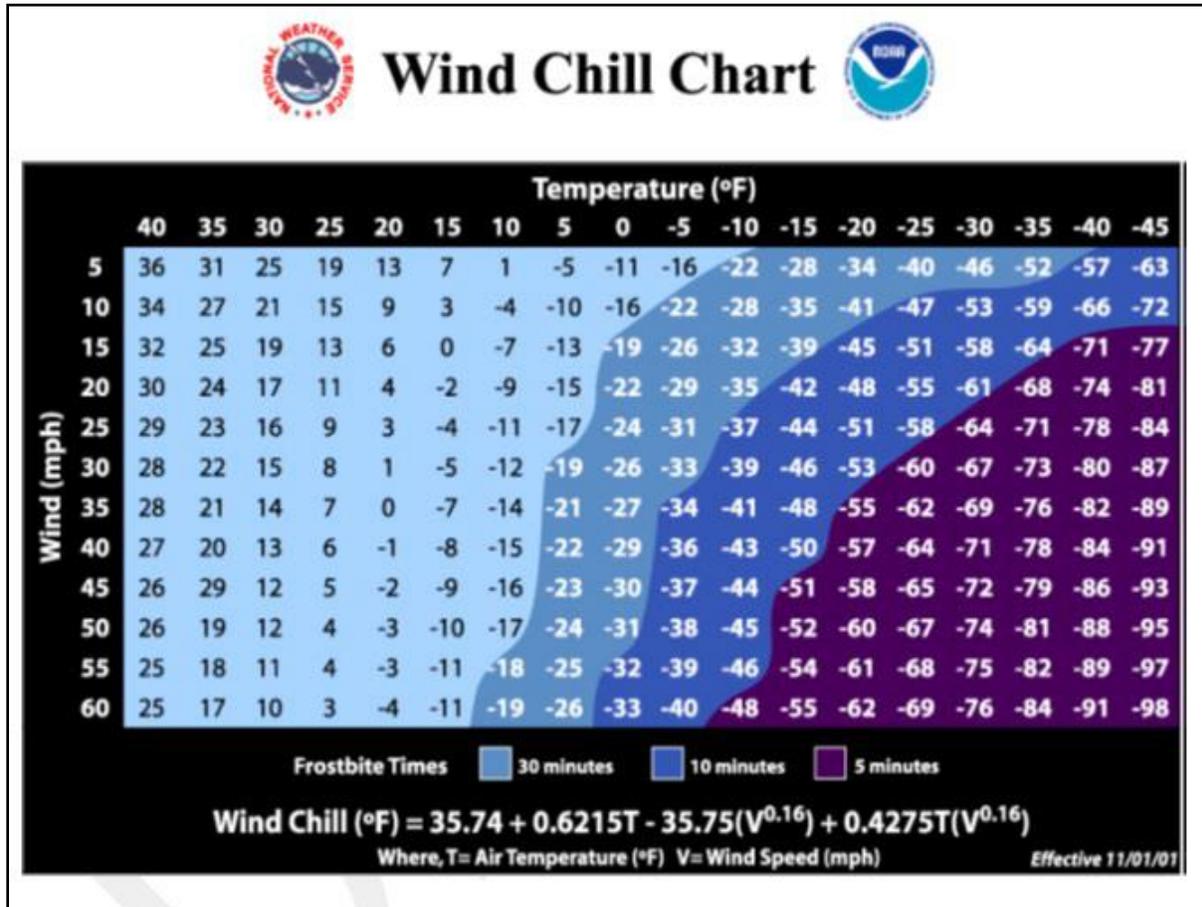


Source: PRISM Climate Group, Oregon State University
<https://prism.oregonstate.edu/normals/>

Source: 2023 SHMP

The wind chill temperature is a measurement of how cold the wind makes the air feel to the human body. Since wind can dramatically accelerate heat loss from the body, a 30° day would feel just as cold as a calm day with 0° temperatures. The following chart factors the wind chill; this is not applicable in calm winds or when the temperature is over 50°.

Wind Chill Chart



Source: National Weather Service

Location

Extreme cold can affect all areas of the City of Texarkana. Areas with older homes without heat or proper insulation and the homeless population would likely be at greater risk.

Extent (Severity)

Low temperatures in the mornings of January 2014 were some of the coldest temperatures Northeast Texas had seen since February 3 through the 5th of 1996. The extreme cold resulted in many underground water lines freezing and bursting. Extreme cold can lead to widespread water main breaks and major pipe bursts, cutting off water for many communities for up to a week and leading to Boil Water Advisories for several weeks in some communities. Extreme cold can be deadly to all vulnerable populations including people who are homeless and do not have a place to get out of the cold. The average winter low temperature in Texarkana is around 15°F. Historically, the coldest recorded temperature was -1°F in 2021, with a wind chill as low as -12°F in 2022. Texarkana can expect average lows of 15°F during winter, with extreme temperatures occasionally dropping to -1°F and wind chills reaching -12°F.

Previous Occurrences

According to the National Centers for Environmental Information (NCEI) storms database, 3 events were reported between 01/01/2011 and 8/31/2023.

<u>Location</u>	<u>County/Zone</u>	<u>St.</u>	<u>Date</u>	<u>Time</u>	<u>T.Z.</u>	<u>Type</u>	<u>Mag</u>	<u>Dth</u>	<u>Inj</u>	<u>PrD</u>	<u>CrD</u>
BOWIE (ZONE)	BOWIE (ZONE)	TX	01/05/2014	16:00	CST-6	Cold/wind Chill		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	02/14/2021	00:00	CST-6	Cold/wind Chill		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	12/22/2022	12:00	CST-6	Cold/wind Chill		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

Probability of Future Occurrence

According to the FEMA National Risk Index, Bowie County has No Rating for Risk of Cold Wave Exposure. Given that there were 3 Extreme Cold events in the last ten years indicates that it is probable that it will occur again in the next 5 years.

Vulnerability

All areas of the City of Texarkana could be vulnerable to the effects of extreme cold. Low-income families with lack of appropriate heat in their homes and the homeless population are most vulnerable to extreme cold.

Climate change and global warming do not necessarily mean less extreme cold events. Extreme cold occurs when the polar jet stream dips south, bringing cold arctic air to regions that don't often experience extreme cold. No one weather event can prove or disprove global warming. (www.pbs.org/newshour/science/why-extreme-cold-weather-events-still-happen-in-a-warming-world)

Impact

The City of Texarkana could be impacted by Extreme Cold. Although Extreme Cold is not common in Northeast Texas, it does happen and when it does it can cause extreme damage. Temperatures falling below freezing can cause pipes to freeze and or burst and leave many people with no water. Exposure to Extreme Cold conditions could result in death due to hypothermia. The effects of climate change, changes in population and changes in land development are not expected to affect the impact of an extreme cold event.

EXTREME COLD RISK					
COMMUNITY	POTENTIAL IMPACT 45%	PROBABLITY 30%	Warning 15%	Duration 10%	RISK
City of Texarkana	Minor PRI = 2	Highly Likely PRI = 4	> 24 hrs. PRI = 1	< a week PRI = 3	Medium 2.55

Mitigation Project Ideas:

- Increase awareness of extreme temperature risk and safety
- Assist vulnerable populations
- Educate property owners about freezing pipes

Source: *FEMA Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards*

Extreme Heat

Description

Extreme heat is characterized by a combination of very high temperatures and exceptionally humid conditions. When persisting over a period of time, it is called a heat wave. A heat wave is defined as 2 or more consecutive days of “unusually hot” weather. Drought and wildfire can accompany extreme heat. Extreme heat can also cause heat related illness and death.

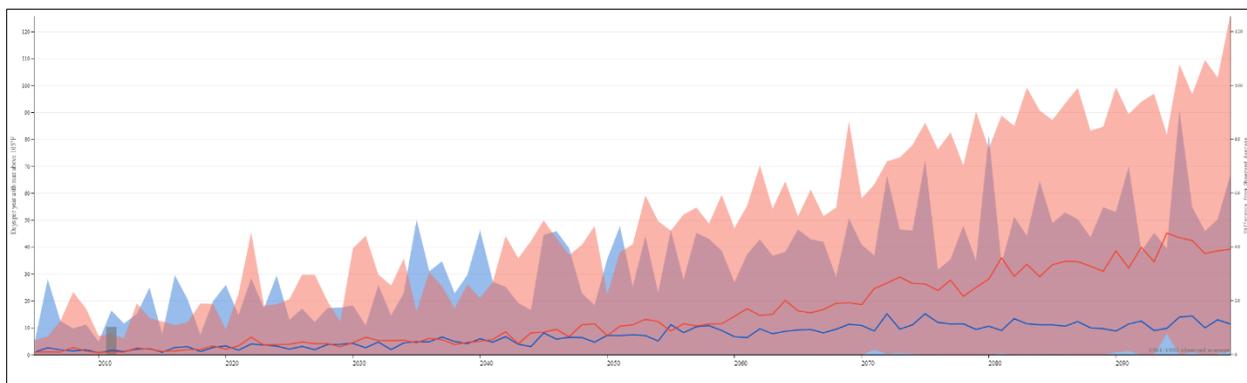
Extreme heat can be a factor that drastically impacts drought conditions, as high temperatures lead to an increased rate of evaporation. The total number of days per year with maximum temperature above various thresholds is an indicator of how often very hot conditions occur. Depending upon humidity, wind, and physical workload, people who work outdoors or don’t have access to air conditioning may feel very uncomfortable or experience heat stress or illness on very hot days. Hot days also stress plants, animals, and human infrastructure such as roads, railroads, and electric lines. Increased demand for electricity to cool homes and buildings can place additional stress on energy infrastructure.

Below is a visual representation of the expected number of days per year that are over 105°F in Bowie County.

- The **blue area** shows the range of projections for a possible future in which global emissions of heat-trapping gases peak around 2040 and then decline.
- The **red area** shows the range of projections for a possible future in which global emissions of heat-trapping gases continue to increase through the 21st century. This scenario is called Representative Concentration Pathway (RCP) 8.5. For planning purposes, people who have a low tolerance for risk often focus on this scenario.
- Average lines, represented by the solid blue and red lines, show the weighted mean of all projections at each time step (projections are weighted based on model independence and skill). The lines aren’t predictions of actual values; they merely highlight trends in the projections.

The trend shows how global emissions have a major role in climate variance and have an impact on extreme heat.

Predicted Number of Days Over 105° in Bowie County

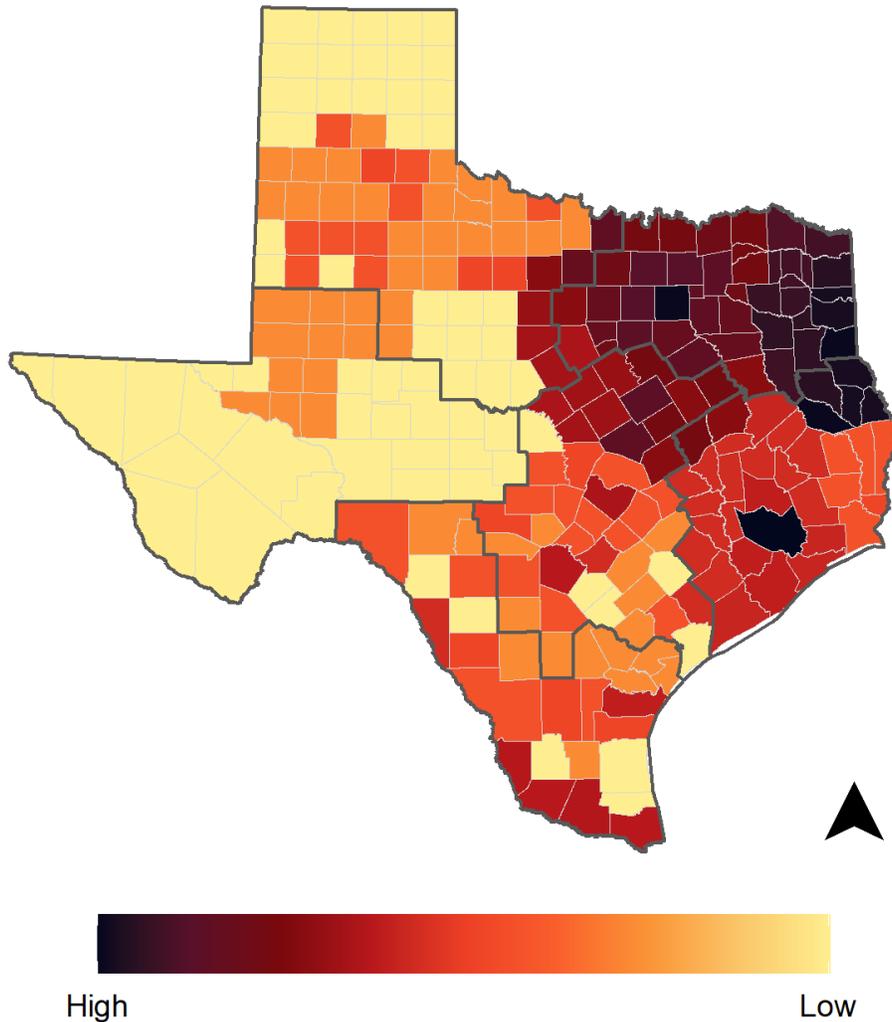


Data Source: <https://toolkit.climate.gov/#climate-explorer>
 Source: <https://ephracking.cdc.gov/Applications/heatTracker/>

Location

According to the 2023 SHMP, the entire state of Texas is subject to extreme heat events. There is no specific geographic scope or location for the hazard, so extreme heat can happen across the entire planning area. The City of Texarkana hottest months are typically June, July and August. The highest recorded temperature in the City of Texarkana area, is recorded at 117°F.

Extreme Heat: Historic Events by County

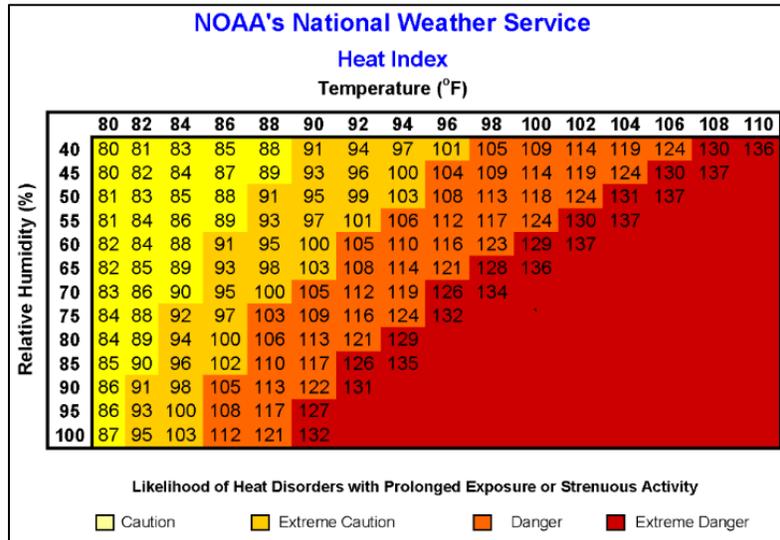


Source: National Center for Environmental Information Storm Events Database
<https://ncdc.noaa.gov/stormevents/>

Source: 2023 SHMP

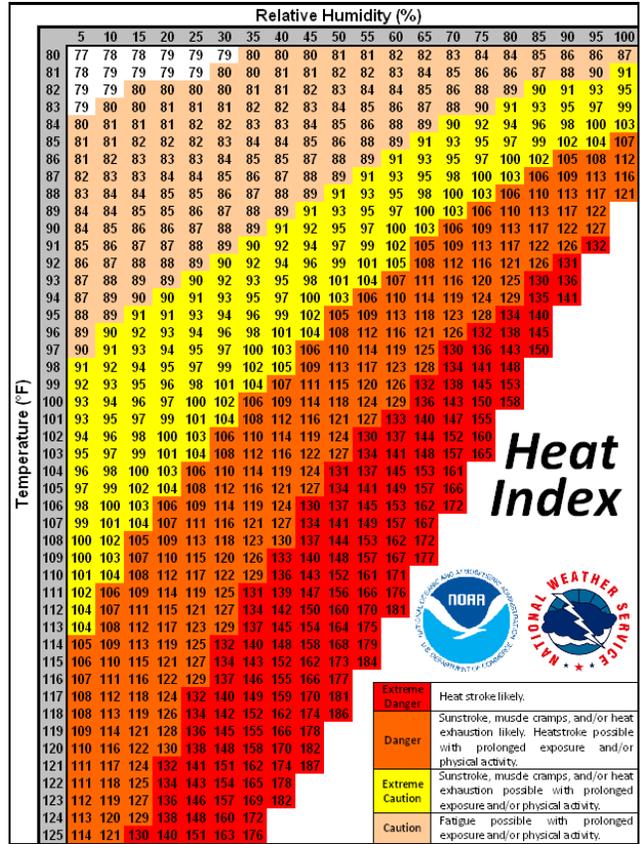
Extent (Severity)

The Heat Index is a measure of how hot it really feels when relative humidity is factored in with the actual air temperature. To find the Heat Index temperature, look at the Heat Index Chart below. As an example, if the air temperature is 96°F and the relative humidity is 65%, the heat index-how hot it feels-is 121°F. The red area without numbers indicates extreme danger. The National Weather Service (NWS) will initiate alert procedures when the Heat Index is expected to exceed 105°-110°F (depending on local climate) for at least 2 consecutive days.



NWS also offers a Heat Index chart, below, for areas with high heat but low relative humidity. Since heat index values were devised for shady, light wind conditions, exposure to full sunshine can increase heat index values by up to 15°F. Also, strong winds, particularly with very hot, dry air, can be extremely hazardous.

Extreme heat in Texarkana from 2013 to 2023 varied from year to year but stayed in the range of 94 degrees to 106 degrees. It is expected that future extreme heat events will continue to stay within this range.



The magnitude or intensity of an extreme heat event is measured according to temperature in relation to the percentage of humidity. According to the National Oceanic Atmospheric Administration (NOAA), this relationship is referred to as the “Heat Index,” and is depicted in the Heat Index & Warnings table below. This index measures how hot it feels outside when humidity is combined with high temperatures.

Heat Index & Warnings

Category	Heat Index	Possible heat disorders	Warning
Extreme Danger	130° F & higher	Heat stroke or sun stroke likely.	A heat advisory will be issued to warn that the Heat Index may exceed 105° F.
Danger	105 – 129° F	Sunstroke, muscle cramps, and/or heat exhaustion are likely. Heatstroke possible with prolonged exposure and/or physical activity.	An Excessive Heat Warning is issued if the Heat Index rises above 105°F at least 3 hours
Extreme Caution	90 – 105° F	Sunstroke, muscle cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.	during the day or above 80 °F at night.
Caution	80 – 90° F	Fatigue is possible with prolonged exposure and/or physical activity.	

Previous Occurrence

According to the National Centers for Environmental Information (NCEI) storms database, 42 events were reported between 01/01/2011 and 08/31/2023 (4626 days)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
BOWIE (ZONE)	BOWIE (ZONE)	TX	08/06/2023	10:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	07/30/2023	09:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	07/19/2023	19:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	07/13/2023	18:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	07/12/2023	09:37	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	08/15/2022	11:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	08/03/2022	12:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	07/24/2022	11:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	07/16/2022	11:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	07/12/2022	11:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	07/04/2022	11:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	06/22/2022	10:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	06/18/2022	11:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	06/11/2022	08:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	09/01/2021	11:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	08/21/2021	10:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	08/09/2021	10:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	08/01/2021	00:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	07/25/2021	09:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	08/28/2020	09:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	08/15/2020	09:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	08/13/2020	11:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	07/10/2020	11:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	08/26/2019	12:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	08/17/2019	09:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	08/07/2019	10:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	07/17/2019	09:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	07/09/2019	09:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	06/21/2019	11:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	07/19/2018	11:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	07/13/2018	11:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	08/19/2017	09:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	07/26/2017	12:00	CST-6	Heat		0	0	0.00K	0.00K

TEXARKANA HAZARD MITIGATION PLAN UPDATE 2024

BOWIE (ZONE)	BOWIE (ZONE)	TX	07/19/2017	20:15	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	08/09/2016	14:10	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	08/03/2016	11:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	07/24/2016	09:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	07/19/2016	14:27	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	07/18/2016	09:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	07/03/2016	11:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	08/05/2015	00:00	CST-6	Heat		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	07/13/2015	00:00	CST-6	Heat		0	0	0.00K	0.00K

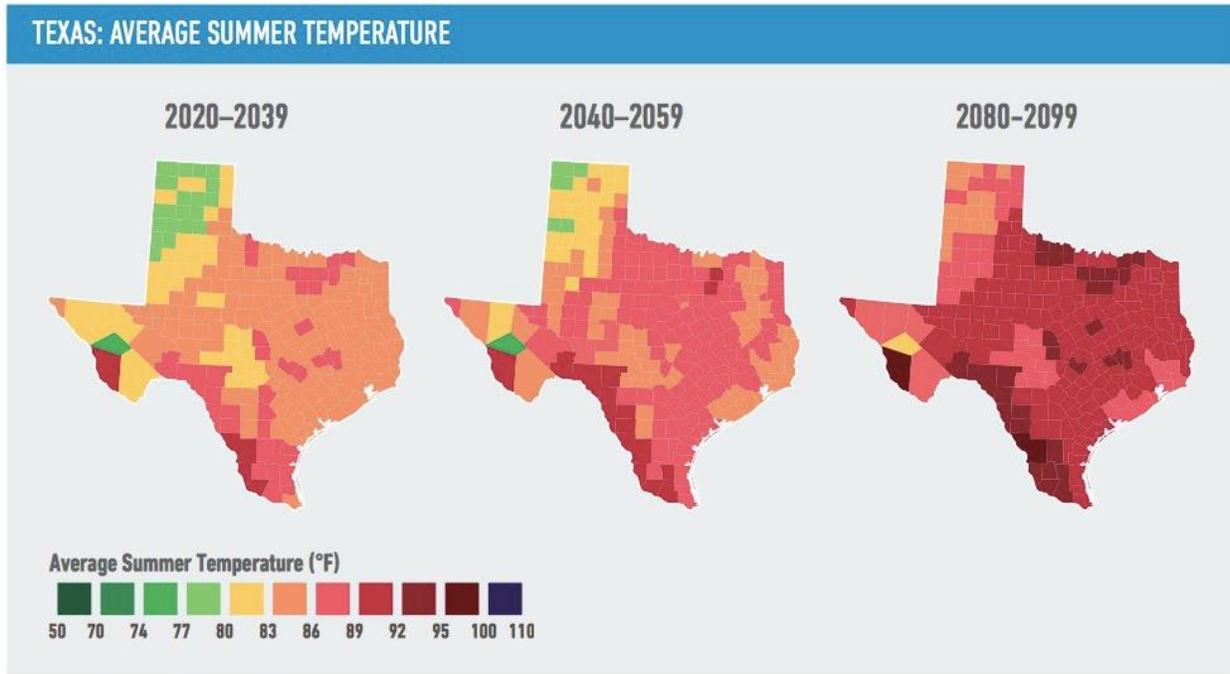
Extreme Heat Past Occurrences in Bowie County, Texas		
Date	Highest Temperature	Days Over 90
June 2013	100	25
July 2013	100	27
August 2013	101	25
June 2014	94	10
July 2014	100	16
August 2014	97	24
June 2015	96	16
July 2015	101	29
August 2015	106	25
June 2016	96	22
July 2016	103	28
August 2016	101	18
June 2017	94	9
July 2017	97	25
August 2017	96	13
June 2018	97	27
July 2018	104	26
August 2018	101	24
June 2019	94	10
July 2019	96	19
August 2019	100	27
June 2020	94	12
July 2020	96	28
August 2020	96	18
June 2021	96	18
July 2021	96	22
August 2021	98	23
June 2022	99	18
July 2022	104	30
August 2022	102	17
June 2023	97	18
July 2023	98	26
August 2023	106	28

Source: National Weather Service

“Extreme heat is a period of high heat and humidity with temperatures above 90 degrees for at least two to three days. In extreme heat your body works extra hard to maintain a normal temperature, which can lead to death.” (*ready.gov*)

Probability of Future Occurrence

According to the FEMA National Risk Index, Bowie County has a Relatively Moderate Rating for Risk of Heat Wave Exposure. It is highly likely that extreme heat waves will continue to occur in the region when the conditions are right. It is a normal, recurrent feature of climate. Bowie County typically has two to six heat occurrences each summer. It is highly likely that the City of Texarkana will experience extreme heat.



Source: American Climate Prospectus

Climate change affects human health by making extreme heat more common, more severe, and last longer. That is expected to continue into the future. ([toolkit.climate.gov](https://www.epa.gov/toolkit-climate-gov))

Vulnerability

The region is vulnerable when there is a deficiency of precipitation over an extended period and high temperatures. The extent of damage or injury increases with the temperature and relative humidity levels. All of Bowie County and the City of Texarkana are vulnerable. The elderly, young and ill are most vulnerable to extreme heat. Low-income families without adequate air conditioning and the homeless are also at risk. Crops and livestock are stressed during extended periods of extreme heat.

Impact

Potential impacts from extreme heat include:

- Heatstroke or death. Elderly people who cannot afford air conditioning are at greatest risk
- Property damage
- Loss of water supply
- Increases grassfire potential and intensity
- Impact on logistics
- Power outages
- Road and train track buckling
- Disruption in critical infrastructure operations

- Vehicle engine failure
- Damage to crops

The effects of climate change, changes in population and changes in land development are not expected to affect the impact of an extreme heat event.

EXTREME HEAT RISK					
COMMUNITY	POTENTIAL IMPACT 45%	PROBABLITY 30%	Warning 15%	Duration 10%	RISK
City of Texarkana	Limited PRI=1	Highly Likely PRI=4	> 24 hours PRI=1	< a week PRI=4	Medium 2..20

Mitigation Project Ideas:

- Reduce urban heat island effect
- Increase awareness of extreme temperature risk and safety
- Assist vulnerable populations

Source: FEMA Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards

Flooding (Flash Flood, Heavy Rain)

Description

Flooding is defined as the accumulation of water within a water body and the overflow of excess water onto adjacent floodplain lands. The floodplain (or flood zone) is the land adjoining the channel of a river, stream, ocean, lake, or other watercourse or water body that is susceptible to flooding. The statistical meaning of terms like “100-year flood” can be confusing. Simply stated, a floodplain can be located anywhere; it just depends on how large and how often a flood event occurs. Floodplains are those areas that are subject to inundation from flooding. Floods and the floodplains associated with them are often described in terms of the percent chance of a flood event happening in any given year. As a community management or planning term, “floodplain” or “flood zone” most often refers to an area that is subject to inundation by a flood that has a 1% chance of occurring in any given year (commonly referred to as the 100-year floodplain).

Flash Flooding

A flash flood is a rapid flood that inundates low-lying areas in less than six hours. This is caused by intense rainfall from a thunderstorm or several thunderstorms. Flash floods can also occur from the collapse of a man-made structure or ice dam. Construction and development can change the natural drainage and create brand new flood risks as the concrete that comes with new buildings, parking lots, and roads create less land that can absorb excess precipitation from heavy rains. Flash floods are a high-risk hazard since they can tear out trees and destroy buildings and bridges.

Flooding from Dam Failure

Besides rains and river or lake overflow, dam breaks can also cause flooding. A dam is defined as a barrier constructed across a watercourse for the purpose of storage, control, or diversion of water. Dams typically are constructed of earth, rock, concrete, or mine tailings. A dam failure is an accidental or unintentional collapse, breach, or other failure of an impoundment structure that results in downstream flooding. Dam failure will be profiled in this plan within the Dam/Levee Failure Section.

Flood Insurance Risk Zones means zone designations on Flood Hazard Boundary Map (FHBM) and Flood Insurance Rate Map (FIRM) that indicate the magnitude of the flood hazard in specific areas of a community. The zone categories are below:

High Risk Area	Description
In communities that participate in the NFIP, mandatory flood insurance purchase requirements apply to all of these zones.	
Zone A	Special flood hazard areas inundated by the 100-year flood; base flood elevations are not determined. Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.
Zone AE	Special flood hazard areas inundated by the 100-year flood; base flood elevations are determined. The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.
Zone A1-30	Special flood hazard areas inundated by the 100-year flood; base flood elevations are determined. These are known as numbered A Zones (e.g., A7 or A14). This is the base floodplain where the FIRM shows a BFE (old format).
Zone AO	Special flood hazard areas inundated by the 100-year flood; with flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.

	River or stream flood hazard areas, and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.
Zone AH	Special flood hazard areas inundated by the 100-year flood; flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations are determined. Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
Zone A99	Special flood hazard areas inundated by the 100-year flood to be protected from the 100-year flood by a Federal flood protection system under construction; no base flood elevations are determined. Areas with a 1% annual chance of flooding that will be protected by a Federal flood control system where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones.
Moderate to Low Risk Area	Description
In communities that participate in the NFIP, flood insurance is available to all property owners and renters in these zones.	
Zone B and Zone X (shaded)	Areas of 500-year flood; areas subject to the 100-year flood with average depths of less than 1 foot or with contributing drainage area less than 1 square mile; and areas protected by levees from the base flood. Area of moderate flood hazard, usually the area between the limits of the 100- year and 500-year floods. B Zones are also used to designate base floodplains of lesser hazards, such as areas protected by levees from 100-year flood, or shallow flooding areas with average depths of less than one foot or drainage areas less than 1 square mile.
Zone C and Zone X (unshaded)	Areas determined to be outside the 500-year floodplain. Area of minimal flood hazard usually depicted on FIRMs as above the 500-year flood level. Zone C may have ponding and local drainage problems that don't warrant a detailed study or designation as base floodplain. Zone X is the area determined to be outside the 500-year flood and protected by levee from 100- year flood.
Undetermined Risk Area	Description
Zone D	Areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted. Flood insurance rates are commensurate with the uncertainty of the flood risk.

National Flood Insurance Program Compliance



The National Flood Insurance Program (NFIP) aims to reduce the impact of flooding on private and public structures. It does so by providing affordable insurance to property owners, renters, and businesses and by encouraging communities to adopt and enforce floodplain management regulations. These efforts help mitigate the effects of flooding on new and improved structures. Overall, the program reduces the socio-economic impact of disasters by promoting the purchase and retention of general risk insurance, but also of flood insurance, specifically. When a community participates in the NFIP, it participates in one of two phases: The Emergency Program or the Regular Program.

Emergency Program: Entry-level participation phase.

- Limited coverage
- Flat rates
- Basic Flood Hazard Boundary Map (FHBM)*

**Initial flood hazard identification*

Regular Program: Most participating communities are in this phase.

- Full participation
- Detailed Flood Insurance Rate Map (FIRM)
- NFIP’s full limits of insurance

The City of Texarkana has participated in the National Flood Insurance Program (NFIP) since June 1974 and is proactive in mitigating properties classified as Repetitive Flood Claim (RFC) or Severe Repetitive Loss (SRL). A list of properties mitigated through elevation, acquisition and/or demolition and those properties remaining on the RFC/SRL list are maintained by the City’s engineering department. Properties will continue to be mitigated as opportunities and funding become available.

The City of Texarkana has adopted a code of ordinance for Flood Damage Prevention. The city has a designated floodplain administrator that reviews applications for floodplain development permits. All new construction or substantial improvements shall be constructed by methods and practices that minimize flood damage. The floodplain administrator makes determinations and requires permits based on the definitions outlined in the ordinance for substantial damage and substantial improvements.

The following table includes the NFIP status as of 03/14/2022:

Community Name	CID	County	Initial FHBM Identified	Initial FIRM Identified	Current Effective Map Date	Reg-Emer Date	Tribal
City of Texarkana	480060B	Bowie	06/07/1974	03/01/1979	12/21/2017	03/01/1979	No
CID: A different community identification number is assigned for the incorporated city versus the unincorporated county.							
Community Name: The incorporated city or unincorporated county, parish, or borough.							
County: This column should match the relative incorporated city, township, village, or other entity.							
Init FHBM Identified: This date tells when the Flood Hazard Boundary Map was created. This map is only a factor in communities that do not have a Flood Insurance Rate Map.							
Init FIRM Identified: This date represents the community’s first Flood Insurance Rate Map, and it is important because it represents the dividing line between two building categories called Pre-FIRM and Post-FIRM.							
Current Effective Map Date: This is the date of the map currently in effect.							
Reg-Emer Date: The date the community first joined the NFIP. An “E” next to the date indicates that the community is in the Emergency Program and subject to limited coverage. If there is no “E” next to the date, then the community participates in the Regular Program.							
Tribal: A “yes” in this column indicates that the participating community is a tribal nation.							
NSFHA: A ‘Non-Special Flood Hazard Area’ is an area that is in a moderate-to-low risk flood zone (Zones B, C, X Pre- and Post-FIRM)							

Data Source: FEMA Community Status Book Report, <https://www.fema.gov/cis/TX.html>.

Jurisdictions participating in the NFIP are required to regulate any development in designated flood prone areas. The City of Texarkana, Texas works within a Federal Emergency Management Agency (FEMA) designated floodplain and requires a floodplain permit.

The NFIP offers three Standard Flood Insurance Policy forms: Dwelling, General Property, and Residential Condominium Building Association. These forms provide policyholders with a description of their coverage and other important coverage information. Below is a table of the local policy statistics.

The following tables describe NFIP compliance within the City of Texarkana, Texas.

# of Repetitive Loss Properties	# of Severe Repetitive Loss Properties
Repetitive Loss Structures: 10 Structure Type: Residential and Commercial Total Losses: 66 Total Paid: \$1,152,403.52	Severe Repetitive Loss Structures: 4 Structure Type: Residential and Commercial Total Losses: 45 Total Paid: \$891,619.73

Staff Resources		
NFIP Topic	Source of Information	Comments
<i>Who acts as your floodplain administrator/manager? (i.e., Director of Community Development)</i>		City Engineer (Sec. 110-63. – Designation of the floodplain administrator)
<i>Is the Community FPA or NFIP Coordinator certified?</i>	Community FPA	Yes
<i>Is floodplain management an auxiliary function?</i>	Community FPA	Yes
<i>Provide an explanation of NFIP administration services (e.g. permit review, GIS, education or outreach, inspections, engineering capability)</i>	Community FPA	The City provides residents with maps and resources depicting floodplains in the area, provide floodplain development applications for new construction, and consult contractors/engineers working in floodway
<i>What are the barriers to running an effective NFIP program in the community, if any?</i>	Community FPA	N/A

Insurance Summary		
NFIP Topic	Source of Information	Comments
<i>How many NFIP policies are in the community? What is the total premium and coverage?</i>	State NFIP Coordinator or FEMA NFIP Specialist	Data Unavailable
<i>How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?</i>	FEMA NFIP or Insurance Specialist	Data Unavailable
<i>How many structures are exposed to flood risk within the community?</i>	Community Floodplain Administrator (FPA)	Data Unavailable

<i>Describe any areas of flood risk with limited NFIP policy coverage</i>	Community FPA and FEMA Insurance Specialist	Data Unavailable
---	---	------------------

Compliance History		
NFIP Topic	Source of Information	Comments
<i>Is the community in good standing with the NFIP?</i>	State NFIP Coordinator, FEMA NFIP Specialist, community records	Yes
<i>Are there any outstanding compliance issues (i.e. current violations)?</i>		No
<i>When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?</i>		Data Unavailable
<i>Is a CAV or CAC needed?</i>		No

Regulation		
NFIP Topic	Source of Information	Comments
<i>When did the community enter the NFIP?</i>	Community Status Book	06/07/1974
<i>Are the FIRMs digital or paper?</i>	Community FPA	Digital
<i>Do floodplain development regulations meet or exceed FEMA or state minimum requirements? If so, in what ways?</i>	Community FPA	Meet
<i>Provide an explanation of the permitting process.</i>	Community FPA, State, FEMA NFIP, Flood Insurance Manual, Community FPA, FEMA CRS Coordinator, ISO representative, CRS Manual	Construction within the 100-year floodplain requires a Floodplain Development Application. Construction within the floodway requires a Floodplain Development Application, an engineered drainage analysis, and no-rise certificate.

Community Rating System (CRS)		
NFIP Topic	Source of Information	Comments
<i>Does the community participate in CRS?</i>	Community FPA, State, FEMA NFIP	No

<i>What is the community's CRS Class Ranking?</i>	Flood Insurance Manual	N/A
---	------------------------	-----

Source: Public Works

Community Rating System

The Community Rating System (CRS) is a voluntary program for communities that participate in the National Flood Insurance Program (NFIP). The goals of the CRS are to reduce flood damage to insurable property, strengthen and support the insurance aspects of the NFIP, and encourage a comprehensive approach to floodplain management. The CRS has been developed to provide incentives in the form of premium discounts for communities to go beyond the minimum floodplain management requirements to develop extra measures to provide protection from flooding. For a community to be eligible, it must be in full compliance with the NFIP.

All communities start out with a Class 10 rating, which provides no discount. There are 10 CRS classes: Class 1 requires the most credit points and gives the greatest premium discount; Class 10 identifies a community that does not apply for the CRS or does not obtain a minimum number of credit points and receives no discount. There are 18 activities recognized as measures for eliminating exposure to floods. Credit points are assigned to each activity. The activities are organized under 4 main categories:

- Public Information
- Mapping and Regulation
- Flood Damage Reduction
- Flood Preparedness

Premium discounts ranging from 5% to a maximum of 45% are applied to eligible policies written in a community as recognition of the floodplain management activities instituted.

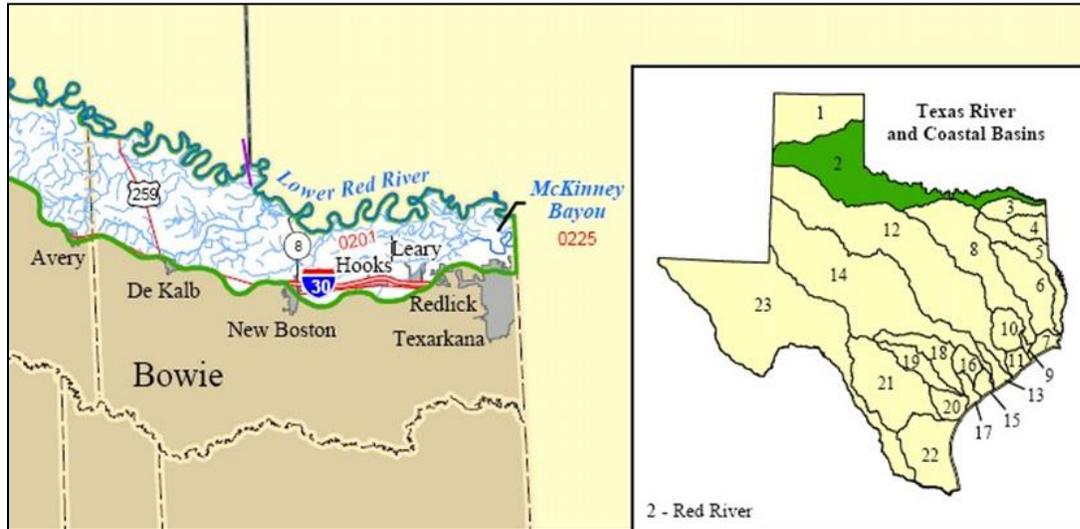
All CRS communities must maintain completed FEMA elevation and floodproofing certificates for all new and substantially improved construction in the Special Flood Hazard Area (SFHA) after the date of application for CRS classification. These certificates must be available upon request. Therefore, in writing a policy, an agent/producer should be able to get these certificates from any CRS community. In addition, some CRS communities receive credit for having completed certificates for Post-Flood Insurance Rate Map (FIRM) buildings constructed prior to the CRS application date. If they do receive this credit, these certificates should also be available to agents/producers writing flood insurance.

The City of Texarkana will analyze the benefits of joining the CRS program.

Location

According to the 2018 Texas State Hazard Mitigation Plan, all regions of Texas are affected by riverine flooding.

Bowie County Portion of the Red River Basin

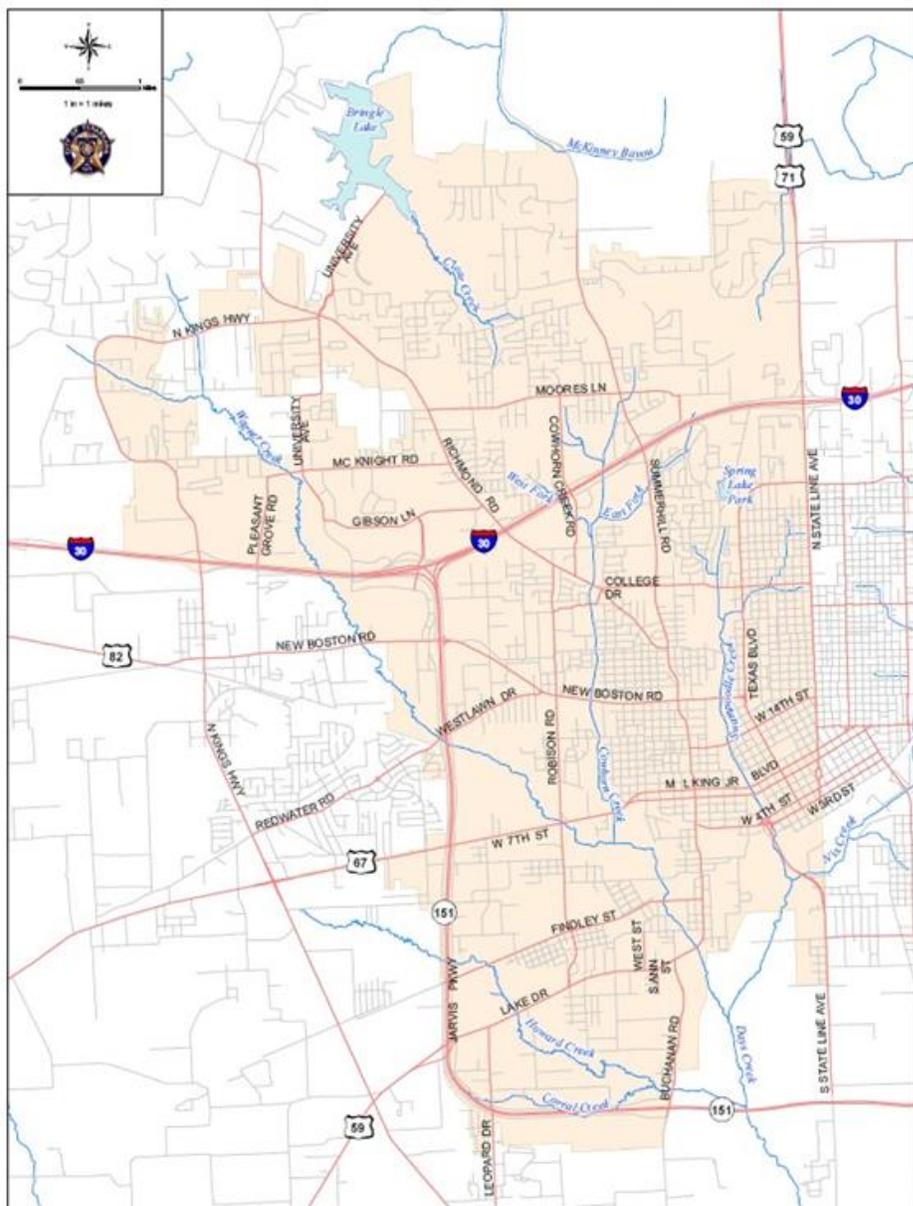


Source: *Texarkana 2011 HMP*

Because of the County’s proximity to the Red and Sulphur Rivers and the presence, within and around its borders, of large tracts of low-lying terrain as well as an abundance of small lakes and waterways (creeks, branches), Bowie County and the City of Texarkana are subject to riverine (and flash) flooding.

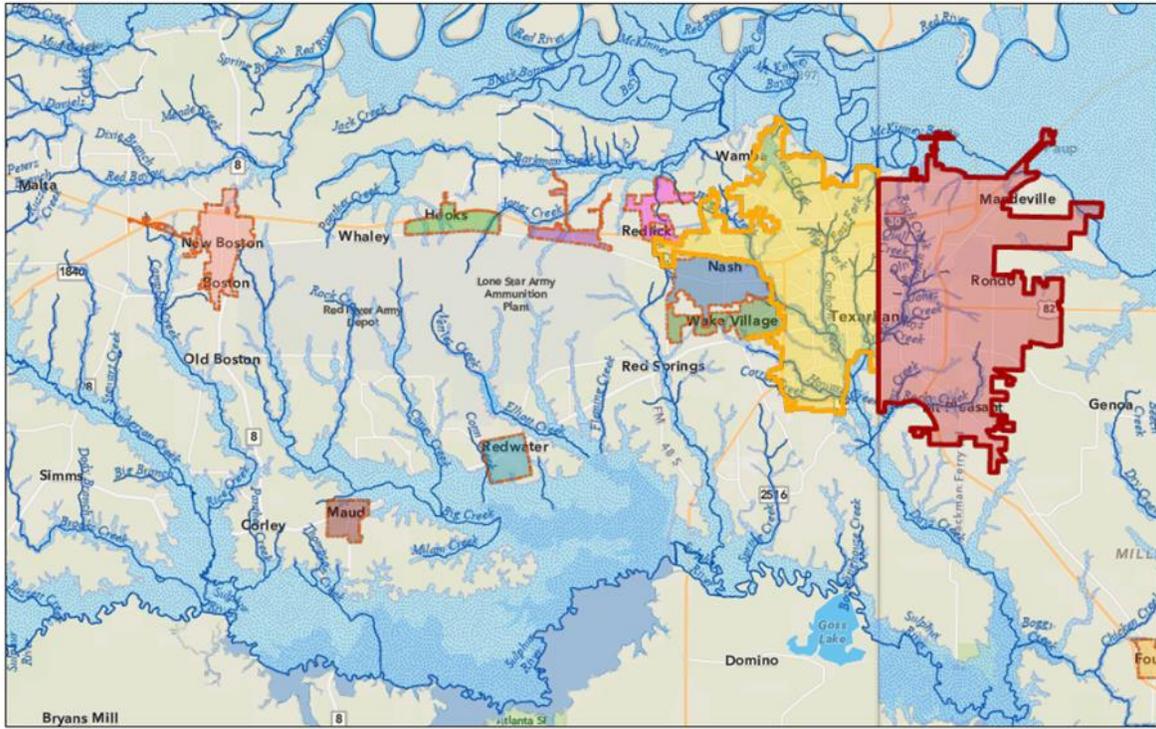
The major watercourse though the City is Nix Creek, with a drainage area of 12.7 miles. In addition to Nix creek, there are seven other creeks and numerous small tributaries that traverse the City including Wagner (sometimes spelled Waggoner) Creek, Cowhorn Creek, Swampoodle Creek, Clear Creek, Howard Creek, No-name Creek and Days Creek. Figure 6.4-2 identifies the major waterways for the City of Texarkana.

City of Texarkana, Major Waterways



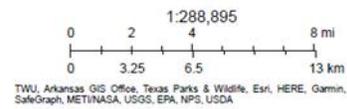
Bowie County Flood Zone Map

ArcGIS Web Map



4/26/2022, 8:53:09 AM

- | | | | | | | |
|----------------------|-------|------------|--------------|---------------|-------|--------------|
| SiteAddressPoint | Hooks | Nash | Redwater | Texarkana, TX | Hooks | Nash |
| Municipal Boundaries | Leary | New Boston | Wake Village | Fouke | Leary | New Boston |
| | Fouke | Maud | Red Lick, TX | Texarkana, AR | Maud | Red Lick, TX |



ArcGIS Web AppBuilder
 TWU, Arkansas GIS Office, Texas Parks & Wildlife, Esri, HERE, Garmin, SafeGraph, METINASA, USGS, EPA, NPS, USDA | none | GISMO |

City of Texarkana Flood Zone Map

National Flood Hazard Layer FIRMette



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE)
Zone A, E, APF
- With BFE or Depth Zone AE, AO, AH, VE, AR
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
- Future Conditions 1% Annual Chance Flood Hazard Zone X
- Area with Reduced Flood Risk due to Levee. See Notes, Zone X
- Area with Flood Risk due to Levee Zone D

OTHER AREAS

- NO SCREEN Area of Minimal Flood Hazard Zone X
- Effective LOMRs
- Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES

- Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS

- Digital Data Available
- No Digital Data Available
- Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/7/2022 at 9:27 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

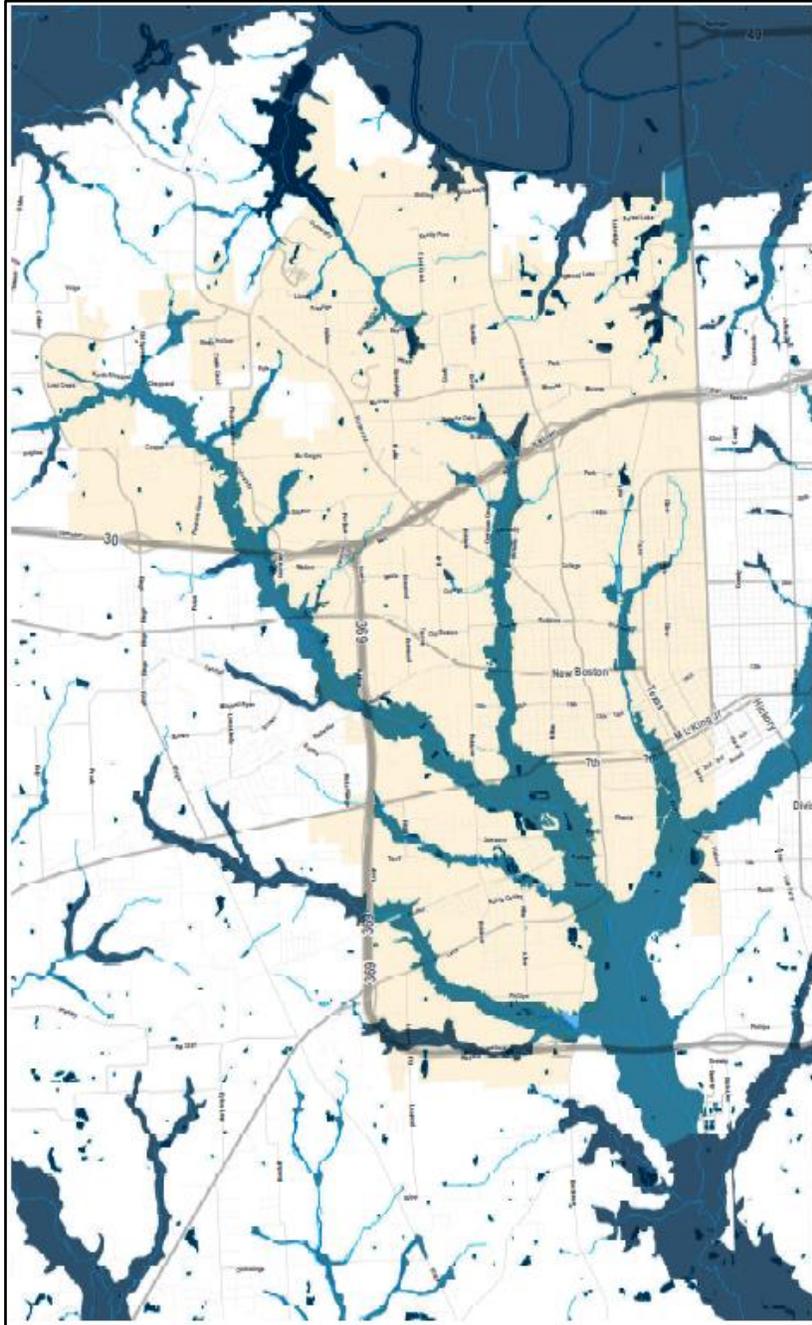
This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Data Source: <https://www.fema.gov/flood-maps/national-flood-hazard-layer>

Extent (Severity)

Approximately 4.43 square miles, or 15%, of the total land area of the City is located within FEMA's 100-year floodplain. *Source: Texarkana Texas 2012 HMP*

City of Texarkana Flood Map



Data Source: *Data Source: Texarkana 2018 Comprehensive Plan, Texarkana Texas 2012 HMP*

Previous Occurrence

Texarkana Data

According to the National Centers for Environmental Information (NCEI) storms database, 3 events were reported in Texarkana between 01/01/2011 and 08/31/2023 (4626 days)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
TEXARKANA	BOWIE CO.	TX	04/20/2023	20:05	CST-6	Flash Flood		0	0	0.00K	0.00K
SOUTH TEXARKANA	BOWIE CO.	TX	05/25/2015	20:18	CST-6	Flash Flood		0	0	0.00K	0.00K
TEXARKANA	BOWIE CO.	TX	06/09/2014	10:00	CST-6	Flash Flood		0	0	0.00K	0.00K

All Bowie County Data

According to the National Centers for Environmental Information (NCEI) storms database, 16 events were reported in Bowie County between 01/01/2011 and 08/31/2023 (4626 days)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
TEXARKANA	BOWIE CO.	TX	04/20/2023	20:05	CST-6	Flash Flood		0	0	0.00K	0.00K
WAKE	BOWIE CO.	TX	04/20/2023	19:40	CST-6	Flash Flood		0	0	0.00K	0.00K
WHATLEY	BOWIE CO.	TX	08/09/2022	11:45	CST-6	Flash Flood		0	0	0.00K	0.00K
NASH	BOWIE CO.	TX	12/16/2021	17:00	CST-6	Flash Flood		0	0	0.00K	0.00K
EYLAU	BOWIE CO.	TX	05/26/2021	01:30	CST-6	Flash Flood		0	0	0.00K	0.00K
DE KALB	BOWIE CO.	TX	05/26/2021	01:30	CST-6	Flash Flood		0	0	0.00K	0.00K
WHATLEY	BOWIE CO.	TX	08/12/2020	08:06	CST-6	Flash Flood		0	0	0.00K	0.00K
OAK GROVE	BOWIE CO.	TX	05/16/2020	17:56	CST-6	Flash Flood		0	0	0.00K	0.00K
DE KALB	BOWIE CO.	TX	01/10/2020	23:28	CST-6	Flash Flood		0	0	0.00K	0.00K
COLLEGE HILL	BOWIE CO.	TX	02/21/2018	13:07	CST-6	Flash Flood		0	0	0.00K	0.00K
POPE	BOWIE CO.	TX	06/04/2017	09:00	CST-6	Flash Flood		0	0	0.00K	0.00K
CARBONDALE	BOWIE CO.	TX	03/08/2016	16:25	CST-6	Flash Flood		0	0	0.00K	0.00K
HOOKS	BOWIE CO.	TX	03/08/2016	16:20	CST-6	Flash Flood		0	0	0.00K	0.00K
WAKE VLG	BOWIE CO.	TX	03/08/2016	16:00	CST-6	Flash Flood		0	0	0.00K	0.00K
BETHLEHEM	BOWIE CO.	TX	03/08/2016	15:20	CST-6	Flash Flood		0	0	0.00K	0.00K
HODGSON	BOWIE CO.	TX	12/27/2015	21:55	CST-6	Flash Flood		0	0	0.00K	0.00K
DE KALB	BOWIE CO.	TX	07/04/2015	13:30	CST-6	Flash Flood		0	0	0.00K	0.00K
DE KALB	BOWIE CO.	TX	07/04/2015	13:30	CST-6	Flash Flood		0	0	0.00K	0.00K
WHATLEY	BOWIE CO.	TX	07/04/2015	07:20	CST-6	Flash Flood		0	0	0.00K	0.00K
SOUTH TEXARKANA	BOWIE CO.	TX	05/25/2015	20:18	CST-6	Flash Flood		0	0	0.00K	0.00K
WAMBA	BOWIE CO.	TX	05/25/2015	17:45	CST-6	Flash Flood		0	0	0.00K	0.00K
WHATLEY	BOWIE CO.	TX	05/11/2015	00:55	CST-6	Flash Flood		0	0	0.00K	0.00K
NEW BOSTON	BOWIE CO.	TX	05/11/2015	00:15	CST-6	Flash Flood		0	0	0.00K	0.00K
TEXARKANA	BOWIE CO.	TX	06/09/2014	10:00	CST-6	Flash Flood		0	0	0.00K	0.00K
NASH	BOWIE CO.	TX	06/09/2014	03:30	CST-6	Flash Flood		0	0	0.00K	0.00K
NEW BOSTON	BOWIE CO.	TX	04/25/2011	18:34	CST-6	Flash Flood		0	0	0.00K	0.00

December 29, 2021



An intense thunderstorm on Dec. 29, 2021 brought dozens, if not hundreds, of small fish falling with the rain and hail over a four - mile swath of Texarkana. At least four locations in town reported a free-fall of fish either during or in the aftermath of two storms that blew through. Some were 4-5 inches long and appeared to be young white bass.

Gary Chatelian, a meteorologist with the National Weather Service in Shreveport, Louisiana, said it is uncommon for fish to fall out of the sky but that it does happen. Fish can be picked up in a water spot or tornadic winds, he said. *Sources: Texarkana Gazette, KXAN*

May 26, 2021

As reported by KTBS News - Storms early Wednesday led to numerous reports of flooding across parts of northeast Texas and southwest Arkansas. Several feet of water were reported in some homes.

Numerous roads flooded across low lying areas of the Texarkana region. First responders were out Wednesday morning working on water rescues at homes and helping stranded motorists.

Authorities say 7th Street had high water covering a long stretch of the roadway. Crews also had to close West 7th street at the Kansas City Southern underpass, the 40th and Potomac intersection and Summerhill Road at Galleria Oaks.

Unofficial rainfall estimates ranged from three to six inches. *Source: KTBS News*

During this same flood event, Texarkana, Texas Firefighters rescued a driver whose vehicle had been swept from New Boston Rd. by the high water.



Source: TXKToday

November 28, 2016

As reported by KSLA News - High water from heavy rain left some drivers stalled and stranded in Texarkana Monday morning, requiring rescues in some cases. At Moores Lane and Summerhill Road on the Texas side of the city one motorist had to be rescued by the fire department when her car stalled in the flood water, she was not injured. In addition, Summerhill Road and Moores Lane, other particularly problematic areas Monday included St. Michael Drive just east of Sam's Club and West 40th at Potomac, according to Shawn Vaughn with the Texarkana, Texas Police Department.



Source: KSLA News

May 2015, Red River Flood in Bowie County.

Bowie County Judge James Carlow declared a state of emergency on May 25, 2015.



In 2015, the Shreveport, La., National Weather Service had history-making forecasts.

"It was an historic and record-breaking year. From an historic perspective, the Red River crested more than six times. Cresting twice was unusual, and it never before had crested these many times in a 12-month period," said Mario D. Valverde, meteorologist-in-charge with the National Weather Service in Shreveport. In addition to the floods, the region had a "flash drought," he said. A contributing factor to the floods was the 15-inch rain created by Tropical Storm Bill. "All it takes is one storm in the right place at the right time, and it can create damage. We're just a couple of hundred miles from the Gulf Coast and could get winds as high as 75 miles in this area," Valverde said. With wet soil and 75 mph winds, trees will fall, he said. Source: *Texarkana Gazette*

Probability of Future Occurrence

According to the FEMA National Risk Index, Bowie County has a Relatively Moderate Rating for Risk of Riverine Flooding. Flash floods are possible at any time during the storm season. According to the NOAA weather service, a flash flood is defined as flooding that occurs within 6 hours after or during a rain. Given that there have been 15 flash flood events in the last 10 years, the probability of another flash flood is likely.

Climate change is increasing the risk of flooding in the US by rising sea levels, increasing extreme precipitation and total precipitation, intensifying storm precipitation, and increasing rates of snow and ice melt. Worsening floods due to climate change are putting a growing number of inland and coastal communities at risk. (climatesignals.org)

Vulnerability

Flash flooding and the inability to accommodate the existing drainage on some roads in the City of Texarkana is a constant problem. Over 2 to 3 inches of rain per hour is considered heavy rain. The City of Texarkana is vulnerable to vehicles getting trapped driving through flooded roadways.

Impact

Flooding can occur anywhere with low-lying areas, clogged drains, and/or intense rain. Potential impacts from flooding include:

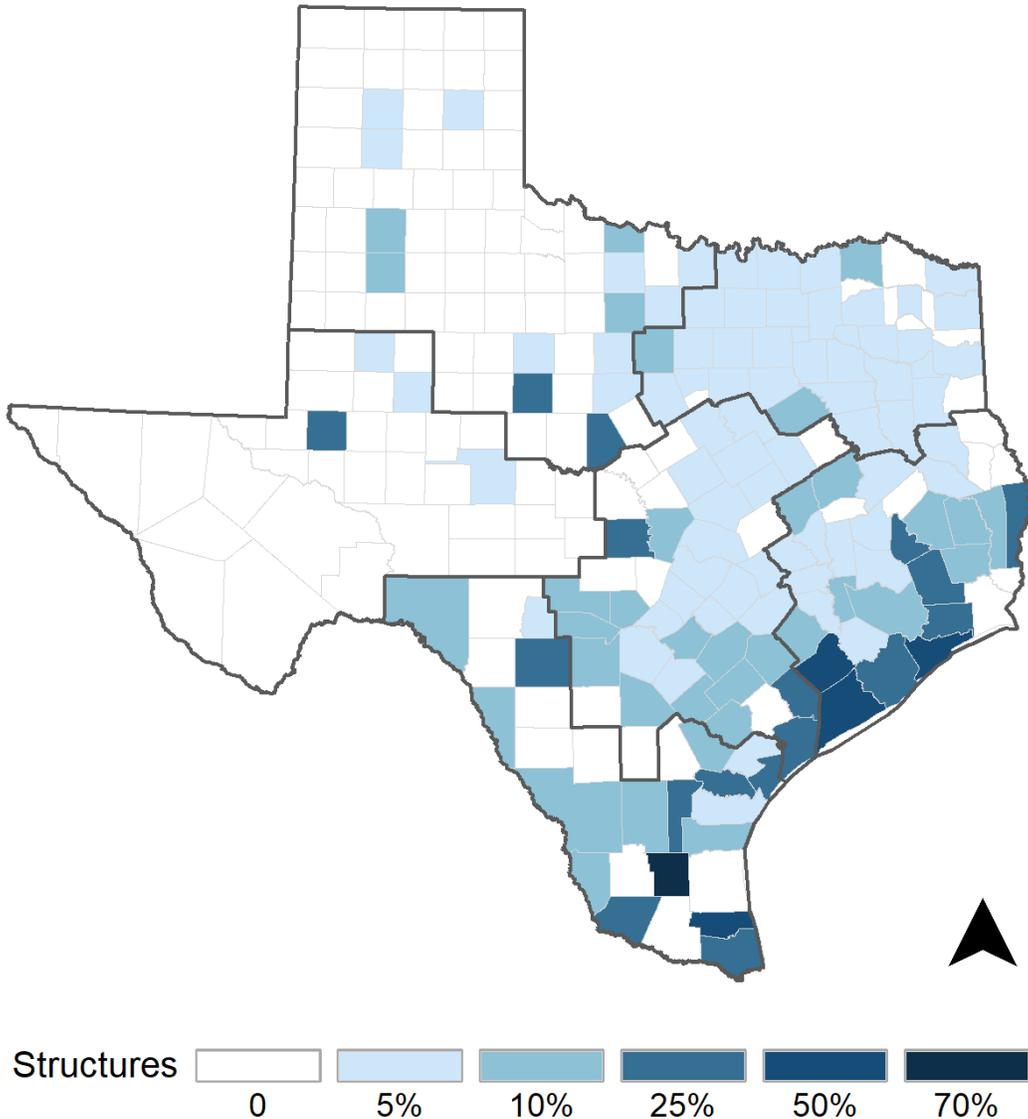
- Loss of electricity
- Loss of, or contamination of, water supply
- Loss of property
- Structure and infrastructure damage – flooded structures and eroded roads
- Misplaced residents
- Snakes migrate and number of mosquitoes increase
- Fire – as a result of loss of water supply
- Debris in transportation paths
- Emergency response delays
- Disruption of traffic can lead to impacts to the economy
- Natural environment damage, to include protected species and critical habitats

The effects of climate change, changes in population and changes in land development are not expected to affect the impact of a flooding event.

FLOOD RISK					
COMMUNITY	POTENTIAL IMPACT 45%	PROBABLITY 30%	Warning 15%	Duration 10%	RISK
City of Texarkana	Limited PRI=1	Occasional PRI=2	< 6 hours PRI=4	< 24 hours PRI=2	Low 1..85

According to the 2023 State Hazard Mitigation Plan, Bowie County has 5% of structures within the Special Flood Hazard Areas.

Flood: Structures in the Special Flood Hazard Areas by County

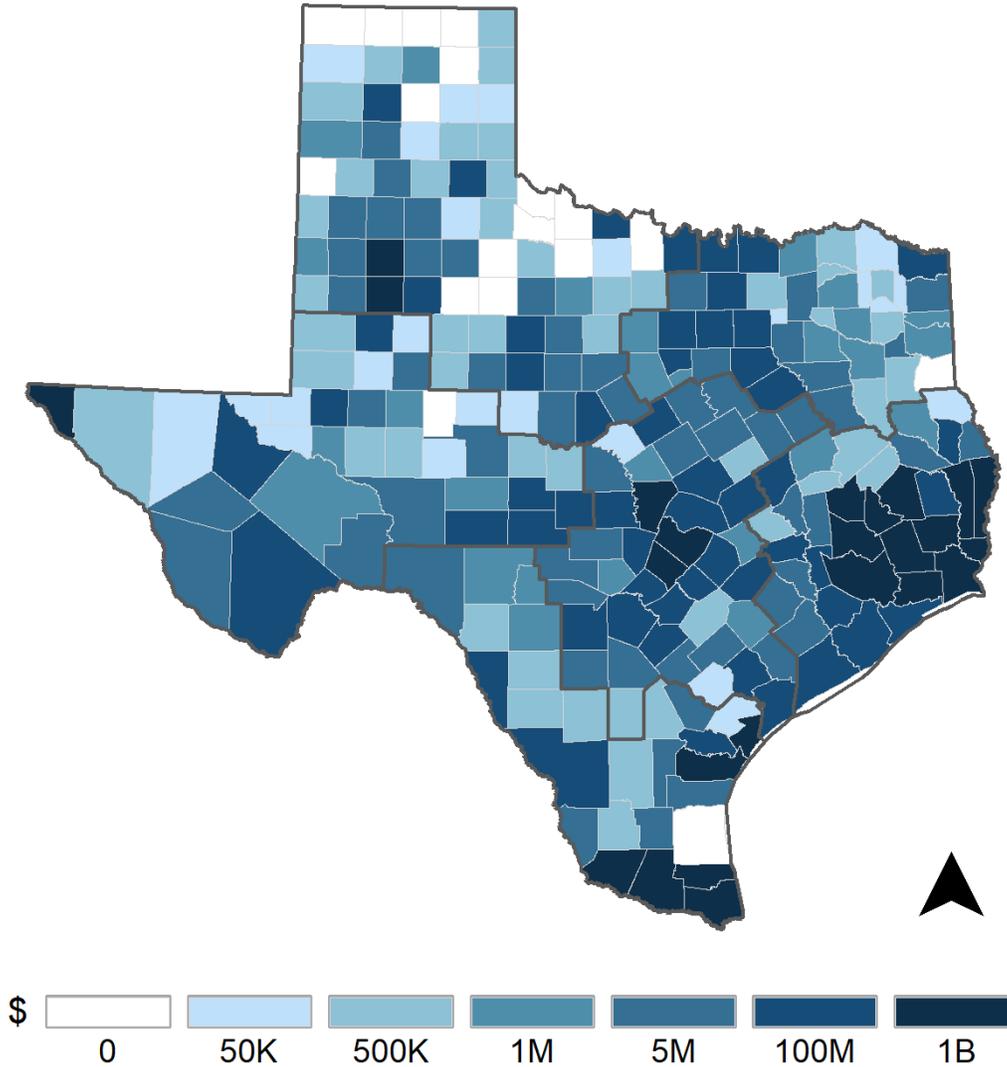


Source: FEMA; USACE National Structures Inventory
www.hec.usace.army.mil/confluence/nsidocs/nsi-documentation-49251650.html

Source: 2023 SHMP

Also, according to the 2023 SHMP, the map below illustrates the total county losses from flooding over the period 2000-2021. The relative loss for Bowie County during this time period was at least one million dollars.

Flood: Historical Losses, 2000-2021



Source: National Center for Environmental Information Storm Events Database
<https://ncdc.noaa.gov/stormevents/>

Source: 2023 SHMP

Mitigation Project Ideas:

- Incorporate flood mitigation in local planning
- Form partnerships to support floodplain management
- Limit or restrict development in floodplain areas
- Adopt and enforce building codes and development standards
- Improve stormwater management planning
- Adopt policies to reduce stormwater runoff
- Improve flood risk assessment
- Improve compliance with NFIP
- Manage floodplain beyond minimum requirements
- Participate in the Community Rating System (CRS)
- Establish local funding mechanisms for flood mitigation
- Remove existing structures from flood hazard areas
- Improve stormwater drainage system capacity
- Conduct regular maintenance for drainage systems and flood control structures
- Elevate or retrofit structures and utilities
- Floodproof residential and non-residential structures
- Protect infrastructure
- Protect critical facilities
- Construct flood control measures
- Protect and restore natural flood mitigation measures
- Preserve floodplains as open space
- Increase awareness of flood risk and safety
- Educate property owners about flood mitigation techniques

Source: FEMA Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards

Hailstorms

Description

Hailstorms are a potentially damaging outgrowth of severe thunderstorms. Hailstorms frequently accompany thunderstorms, so their locations and spatial extents overlap. Hail can cause substantial damage to vehicles, roofs, landscaping, and other areas of the built environment. U.S. agriculture is typically the area most affected by hailstorms, which cause severe crop damage even during minor events. Hail is formed when drops of water freeze together in the cold upper regions of thunderstorm clouds. These chunks of ice are called hailstones. Most hailstones measure between 5 millimeters and 15 centimeters in diameter and can be round or jagged. Hailstones are not frozen raindrops. Early in the developmental stages of a hailstorm, frozen droplets gradually accumulate into ice crystals, until they fall as precipitation that is round or irregularly shaped masses of ice greater than 0.75 inches in diameter. The size of hailstones is a direct result of the size and severity of the storm. High velocity updraft winds keep hail in suspension in thunderclouds. The strength of the updraft is a byproduct of heating on the Earth’s surface. Higher temperature gradients above Earth’s surface result in increased suspension time and hailstone size.

NCDC Hail Intensity and Magnitude

SIZE CODE	INTENSITY CATEGORY	SIZE (Diameter Inches)	DESCRIPTIVE TERM (Size)	TYPICAL DAMAGE
H0	Hard Hail	Up to 0.33	Pea	No damage
H1	Potentially Damaging	0.33 – 0.60	Marble	Slight damage to plants/crops
H2	Potentially Damaging	0.60 – 0.80	Dime	Significant damage to plants/crops
H3	Severe	0.80 – 1.20	Nickel	Severe damage to plants and crops
H4	Severe	1.2 – 1.6	Quarter	Widespread glass and auto damage
H5	Destructive	1.6 – 2.0	Half Dollar	Widespread destruction of glass, roofs, and risk of injuries
H6	Destructive	2.0 – 2.4	Ping Pong Ball	Aircraft bodywork dented and brick walls pitted
H7	Very Destructive	2.4 – 3.0	Golf Ball	Severe roof damage and risk of serious injuries
H8	Very Destructive	3.0 – 3.5	Hen Egg	Severe damage to all structures
H9	Super Hailstorms	3.5 – 4.0	Tennis Ball	Extensive structural damage, could cause fatal injuries

Source: NCEI Intensity Scale, based on the TORRO Hailstorm Intensity Scale

Location

Hailstorms are not confined to any specific geographic location, and can vary greatly in terms of size, location, intensity, and duration. Although hailstorms have not been directly responsible for any Disaster Declarations in the last five years, they do occur every year, affect every region of Texas, and can cause massive damage to property.

Extent (Severity)

The National Weather Service (NWS) classifies a storm as severe if hail of three-quarters of an inch in diameter (approximately the size of a penny) or greater is present, based on radar intensity or seen by observers. The intensity category of a hailstorm depends on its size and the potential damage it could cause, as depicted in the NCDL Hail Intensity and Magnitude Table. The table shows that hail events range from descriptors H0 to H9. The City of Texarkana planning area has experienced hailstorms ranging from H2 to H5. Future hailstorms are expected to remain within this range.

Previous Occurrence

According to the National Centers for Environmental Information (NCEI) storms database, 81 events were reported across Bowie County between 01/01/2011 and 08/31/2023 (4626 days)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
DEFENSE	BOWIE CO.	TX	06/26/2023	07:35	CST-6	Hail	1.25 in.	0	0	0.00K	0.00K
HOOKS	BOWIE CO.	TX	06/26/2023	07:24	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K
HOOKS	BOWIE CO.	TX	06/26/2023	07:18	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
HOOKS	BOWIE CO.	TX	06/26/2023	07:17	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K
RED SPGS	BOWIE CO.	TX	06/26/2023	06:40	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
SILOAM	BOWIE CO.	TX	06/13/2023	12:57	CST-6	Hail	1.25 in.	0	0	0.00K	0.00K
RED SPGS	BOWIE CO.	TX	04/20/2023	18:25	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
LEARY	BOWIE CO.	TX	04/20/2023	18:20	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
DALBY SPGS	BOWIE CO.	TX	03/31/2023	14:48	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
HARTMAN	BOWIE CO.	TX	09/25/2022	15:27	CST-6	Hail	1.25 in.	0	0	0.00K	0.00K
SOUTH TEXARKANA	BOWIE CO.	TX	09/25/2022	15:15	CST-6	Hail	1.25 in.	0	0	0.00K	0.00K
TEXARKANA	BOWIE CO.	TX	06/26/2022	18:04	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
WHATLEY	BOWIE CO.	TX	12/10/2021	22:45	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
WAKE	BOWIE CO.	TX	05/26/2021	01:20	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
DE KALB	BOWIE CO.	TX	04/14/2021	04:27	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
DE KALB	BOWIE CO.	TX	04/09/2021	11:56	CST-6	Hail	1.50 in.	0	0	0.00K	0.00K
DE KALB	BOWIE CO.	TX	04/09/2021	11:55	CST-6	Hail	1.25 in.	0	0	0.00K	0.00K
MAUD	BOWIE CO.	TX	03/17/2021	06:58	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
HOLLAND	BOWIE CO.	TX	02/25/2021	22:37	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
NASH	BOWIE CO.	TX	02/25/2021	22:35	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
HOOKS	BOWIE CO.	TX	05/26/2020	20:25	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
REDWATER	BOWIE CO.	TX	11/30/2019	11:03	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K

TEXARKANA HAZARD MITIGATION PLAN UPDATE 2024

MAUD	BOWIE CO.	TX	11/30/2019	10:56	CST-6	Hail	1.25 in.	0	0	0.00K	0.00K
MAUD	BOWIE CO.	TX	06/29/2019	08:05	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
LEARY	BOWIE CO.	TX	06/29/2019	02:50	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
REDWATER	BOWIE CO.	TX	12/14/2018	04:40	CST-6	Hail	1.50 in.	0	0	0.00K	0.00K
WHATLEY	BOWIE CO.	TX	05/23/2018	17:00	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
SILOAM	BOWIE CO.	TX	04/06/2018	15:17	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K
NEW BOSTON	BOWIE CO.	TX	01/21/2017	17:48	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
DEFENSE	BOWIE CO.	TX	05/09/2016	22:21	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K
REDWATER	BOWIE CO.	TX	05/09/2016	22:21	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
LEARY	BOWIE CO.	TX	05/09/2016	22:00	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
LEARY	BOWIE CO.	TX	05/09/2016	21:55	CST-6	Hail	1.25 in.	0	0	0.00K	0.00K
LEARY	BOWIE CO.	TX	05/09/2016	21:52	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
SMITH HILL	BOWIE CO.	TX	05/09/2016	21:43	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
DE KALB	BOWIE CO.	TX	05/09/2016	21:21	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
DE KALB	BOWIE CO.	TX	05/09/2016	21:00	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K
HOOKS	BOWIE CO.	TX	04/29/2016	01:28	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
NEW BOSTON	BOWIE CO.	TX	04/29/2016	01:15	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
WHATLEY	BOWIE CO.	TX	04/11/2016	11:02	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
WHATLEY	BOWIE CO.	TX	04/11/2016	10:45	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
MALTA	BOWIE CO.	TX	04/11/2016	10:00	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
TEXARKANA	BOWIE CO.	TX	03/17/2016	09:38	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
HOOKS	BOWIE CO.	TX	03/17/2016	09:21	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
HOOKS	BOWIE CO.	TX	03/17/2016	09:12	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
DE KALB	BOWIE CO.	TX	05/25/2015	16:15	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
MAUD	BOWIE CO.	TX	05/09/2015	18:20	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
BURNS	BOWIE CO.	TX	05/09/2015	17:20	CST-6	Hail	1.50 in.	0	0	0.00K	0.00K
NEW BOSTON	BOWIE CO.	TX	05/09/2015	17:00	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K
NEW BOSTON	BOWIE CO.	TX	05/09/2015	16:33	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
TEXARKANA	BOWIE CO.	TX	06/08/2014	19:19	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K
TEXARKANA	BOWIE CO.	TX	06/08/2014	19:18	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
WAKE	BOWIE CO.	TX	05/09/2014	19:10	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
NASH	BOWIE CO.	TX	05/09/2014	19:10	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
REDWATER	BOWIE CO.	TX	05/09/2014	17:20	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
DE KALB	BOWIE CO.	TX	04/03/2014	21:34	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
WHATLEY	BOWIE CO.	TX	03/28/2014	16:50	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
SIMMS	BOWIE CO.	TX	03/28/2014	15:34	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K
OLD BOSTON	BOWIE CO.	TX	03/28/2014	15:18	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K

TEXARKANA HAZARD MITIGATION PLAN UPDATE 2024

WAKE	BOWIE CO.	TX	03/31/2013	08:23	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
SIMMS	BOWIE CO.	TX	03/31/2013	07:59	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
NEW BOSTON	BOWIE CO.	TX	02/25/2013	12:25	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K
SIMMS	BOWIE CO.	TX	02/25/2013	11:45	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K
SILOAM	BOWIE CO.	TX	02/21/2013	07:45	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
BASSETT	BOWIE CO.	TX	08/07/2012	18:25	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
HOLLAND	BOWIE CO.	TX	07/08/2012	17:54	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
CARBONDALE	BOWIE CO.	TX	06/15/2012	17:43	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
HARTMAN	BOWIE CO.	TX	06/12/2012	01:15	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
SIMMS	BOWIE CO.	TX	05/15/2012	18:35	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
HOOKS	BOWIE CO.	TX	05/07/2012	17:50	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
NASH	BOWIE CO.	TX	04/03/2012	16:33	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
TEXARKANA	BOWIE CO.	TX	04/03/2012	16:30	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
DE KALB	BOWIE CO.	TX	04/03/2012	16:03	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
HOOKS	BOWIE CO.	TX	04/02/2012	14:00	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
HOOKS	BOWIE CO.	TX	01/10/2012	08:45	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
SIMMS	BOWIE CO.	TX	09/22/2011	13:00	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
HOOKS	BOWIE CO.	TX	04/19/2011	23:10	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K
NEW BOSTON	BOWIE CO.	TX	04/19/2011	22:50	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
DE KALB	BOWIE CO.	TX	04/19/2011	22:35	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K
WAKE VLG	BOWIE CO.	TX	04/04/2011	07:40	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
NEW BOSTON	BOWIE CO.	TX	04/04/2011	07:09	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K

Probability of Future Occurrence

According to the FEMA National Risk Index, Bowie County has a Relatively High Rating for Risk of Hail. Based on past hail events across Bowie County, the probability of a hailstorm strike in the City of Texarkana is highly likely.

Hailstorms are dangerous and costly phenomena that are expected to change in response to a warming climate. As a result of anthropogenic warming, it is generally anticipated that low-level moisture and convective instability will increase, raising hailstorm likelihood and enabling the formation of larger hailstones; the melting height will rise, enhancing hail melt and increasing the average size of surviving hailstones; and vertical wind shear will decrease overall, with limited influence on the overall hailstorm activity, owing to a predominance of other factors. (researchgate.net)

Vulnerability

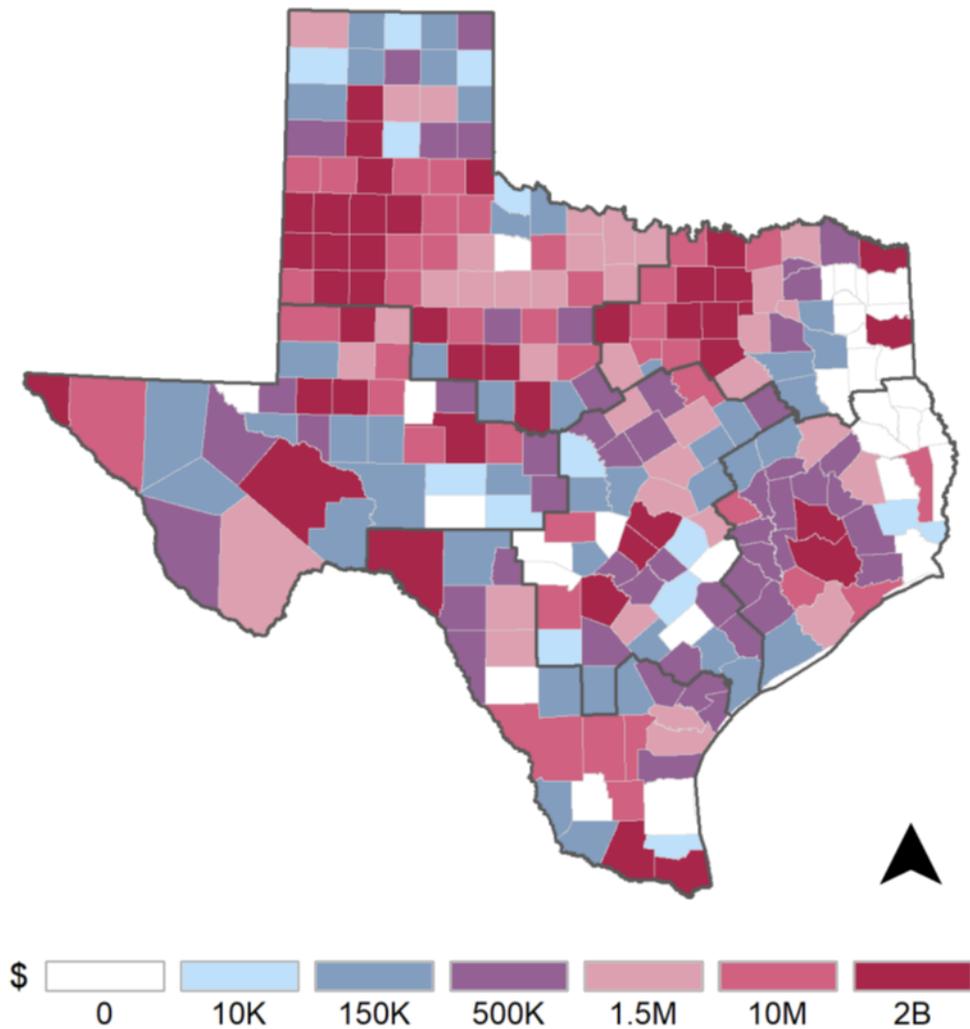
Buildings, autos, and crops can be damaged by hail. Hail is often a part of thunderstorm activity. In rare cases hail can cause physical injury.

Impact

Damages to the City of Texarkana planning area with H2 to H5 hail events could include significant damage to plants and crops, severe damage to plants and crops, widespread glass and auto damage, and widespread destruction of glass, roofs, and risk of injuries. The effects of climate change, changes in population and changes in land development are not expected to affect the impact of a hailstorm event.

Estimated Property Loss at 25%		
Texarkana	Residential	\$310,230,216

Hailstorm: Historical Losses, 2000-2021



Source: National Center for Environmental Information Storm Events Database
<https://ncdc.noaa.gov/stormevents/>

Source: 2023 SHMP

HAILSTORM RISK					
COMMUNITY	POTENTIAL IMPACT 45%	PROBABLITY 30%	Warning 15%	Duration 10%	RISK
City of Texarkana	Limited PRI=1	Highly Likely PRI=4	<6 hrs. PRI=4	<6 hrs. PRI=1	Medium 2.35

Mitigation Project Ideas:

- Locate safe rooms to minimize damage
- Protect buildings from hail damage
- Increase hail risk awareness

Source: FEMA Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards

Infectious Disease

Description

An infectious disease is defined as a clinically evident disease resulting from the presence of pathogenic microbial agents. According to FEMA, infectious diseases are a major threat around the world, killing millions globally each year. Transmission of an infectious disease may occur through one or more means including physical contact with infected individuals. These infecting agents may also be transmitted through liquids, food, bodily fluids, contaminated objects, airborne inhalation, or through vector-borne dissemination.

Three terms are commonly used to classify disease impacts: endemic, epidemic, and pandemic. An endemic is always present at a low frequency (e.g., chicken pox in the United States). An epidemic is a sudden severe outbreak of disease (e.g., the bubonic plague during Medieval times). A pandemic is an epidemic that becomes very widespread and affects a whole region, a continent, or the world (e.g., the 1957 flu pandemic caused at least 70,000 deaths in the United States and 1-2 million deaths worldwide). Fears of pandemic spread have risen in recent years as our globalized economy and growing population fosters large scale international travel and trade. Growing populations increase the vulnerability of all areas to disease as it can travel more quickly and creates difficulty in preventing the spread of infection.

The top 11 infectious disease mortality causes, according to the most recently available report from the World Health Organization based upon number of deaths worldwide are presented in the table below.

Worldwide Mortality Due to Infectious Disease

Source: World Health Organization

RANK	CAUSE OF DEATH	APPROXIMATE WORLDWIDE DEATHS 2008	PERCENTAGE OF ALL DEATHS WORLDWIDE
1	Lower Respiratory Infections	3.5 million	6.1%
2	Diarrheal diseases	2.5 million	4.3%
3	HIV/AIDS	1.8 million	3.1%
4	Tuberculosis (TB)	1.3 million	2.4%
5	Malaria	827,000	1.5%
6	Meningitis	340,000	0.6%
7	Pertussis	195,000	0.3%
8	Measles	155,000	0.3%
9	Hepatitis B	128,000	0.2%
10	Syphilis	100,000	0.2%
11	Tetanus	88,000	0.2%

Location

Pandemics occur randomly, with several occurring each century. Regardless of the origin, the disease has a global impact, and all areas are vulnerable. Developing countries have fewer resources to fight disease and may be more vulnerable than industrialized nations. The public health system works at the federal, state, and local levels to monitor diseases, plan, and prepare for outbreaks, and prevent epidemics to the degree possible. However, given the level of air travel among populations worldwide, as well as the level of worldwide shipping of products, it has become increasingly difficult to contain localized outbreaks. Infectious Disease can happen anywhere in the planning area.

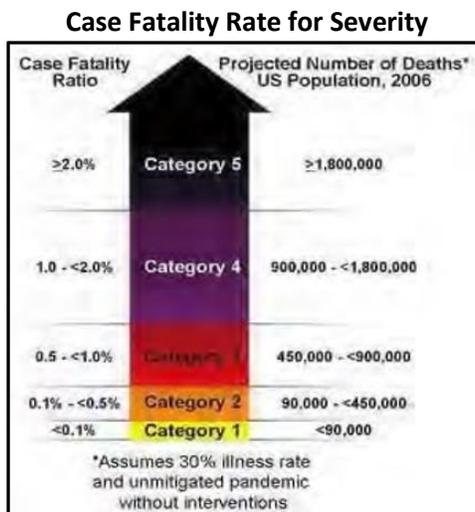
Extent (Severity)

The costs to the public health sector in terms of responding to an outbreak, as well as impact to overall community health, can be “Substantial”. Multiple deaths could occur, and facilities could be shut down for 30 days or more. While indirect, it is possible that property damage would result from the high absenteeism of persons responsible for property or infrastructure management. Impact statements are defined in the table below.

Extent Descriptions

Potential Severity	Description
Substantial	Multiple deaths. Complete shutdown of facilities for 30 days or more. More than 50% of property destroyed or with major damage.
Major	Injuries and/or illnesses result in permanent disability. Complete shutdown of critical facilities for at least two weeks. More than 25% of property destroyed or with major damage.
Minor	Injuries and/or illnesses do not result in permanent disability. Complete shutdown of critical facilities for more than one week. More than 10% of property destroyed or with major damage.
Limited	Injuries and/or illnesses are treatable with first aid. Minor quality of life lost. Shutdown of critical facilities and services for 24 hours or less. Less than 10 % of property destroyed or with major damage.

The pandemic virus severity can be evaluated on two levels: the number of individuals infected, and the population – that is, how many complications and deaths might be expected. Measuring severity from either perspective in real time is a major challenge. The most common measure of severity is the case fatality rate (CFR).



Source: World Health Organization

The magnitude of a pandemic event is also evaluated from the population level in terms of warnings. The figure below illustrates the various warning levels for pandemic. The planning area has been impacted by pandemic infection rates and uncontrolled community spread of the COVID-19 virus.



Source: World Health Organization

Previous Occurrence

The information on past occurrence of infectious disease was gathered from the Centers for Disease Control and Prevention and the World Health Organization.

Infectious Disease Over Time

1999-2002 – West Nile Virus: The first account of the West Nile Virus in the U.S. was in New York City in the summer of 1999. The virus was transmitted by mosquito bites, concentrating in areas with warmer temperatures; as the number of human cases grew, so did the number of bird deaths. During a three-year period, WNV spread to 44 states, amounting to 4,156 cases and 284 deaths. Typical symptoms include breaking out in high fever, a stiff neck, and headaches, though most people who are infected do not show any symptoms unless the infection is serious.

2001 – Anthrax: After 9/11, letters contaminated with white powder containing anthrax spores were delivered to a news media company and two U.S. Senators' offices. The powder let the anthrax spores float in the air to be breathed in. The first diagnosed case came in October 2001 and climbed to 22 cases and five deaths. The FBI led a nine-year investigation on how anthrax got in those letters, and concluded the powder came from a research lab.

2003 – SARS-CoV: Severe Acute Respiratory Syndrome, a viral respiratory illness caused by a coronavirus, was first diagnosed in Asia in February of 2003, later reaching the U.S. in that same year. Common symptoms included high fevers, coughing and shortness of breath. A total of 8,098 people worldwide became sick, with only eight of those cases being in the U.S., and 774 people died.

2006 – Mumps: The U.S. saw multi-state outbreaks of mumps reporting more than 6,500 cases in 2006, concentrating in Midwestern college campuses. Mumps spread through close-contact activities such as sports, dancing, kissing, etc. From 2009 to 2010, the largest outbreak reported 3,000 cases in a close-knit religious community in New York City after an infected student returned from the UK where there was another outbreak. Notable symptoms include fever, puffy cheeks, and a swollen, tender jaw.

2006 – E. coli & Salmonella: Escherichia coli was first reported in the U.S. in 2006 through the contamination of fresh spinach, with 199 reported cases and three deaths within 26 states. The following year, Taco Bell was linked to E. coli cases in the northeastern area of the U.S. The contraction of E. coli can lead to the development of Hemolytic Uremic Syndrome and potentially kidney failure, while other notable symptoms are severe diarrhea and respiratory illnesses. In 2008, 49 cases in multiple states were linked to consuming Kroger Beef and in 2009 raw cookie dough was the culprit. However, the most infamous outbreak occurred in 2015, where 58 cases were reported in 14 states. In 2006, tomatoes were linked to Salmonella for 183 cases in 21 states. The list of foods linked to salmonella ranged from cantaloupe, peanut butter, raw chicken to even pet food. In 2012, cases of Salmonella linked to small turtles led to 473 cases in 43 states, but no deaths were reported. The most recent outbreaks have been reported from consumption of a specific brand of tahini in 2018. Common symptoms include diarrhea, fever, and abdominal cramps.

2009 – H1N1 Virus (Swine Flu): In April of 2009, 20 cases of swine flu were reported in the U.S., eventually becoming a pandemic flu reaching 208 countries by December and resulting in at least 12,220 deaths. The swine flu was transmitted by pigs as a respiratory disease, usually through contact with farm raisers or participation in fairs.

2012 – Whooping Cough: Also known as pertussis, this respiratory disease surmounted to 48,277 cases in the U.S. in 2012. Coughing fits last up to 10 weeks or more and can be life-threatening for infants. Worldwide, the estimation of whooping cough cases is 24.1 million with about 160,700 deaths per year according to the National Center for Biotechnology Information.

2012 – MERS-CoV: Middle East Respiratory Syndrome was first found in the Arabian Peninsula in 2012 and was also associated with the coronavirus once the illness became viral. Only two cases were found in the U.S. in 2014, one in Indiana and another in Florida, linked to health care providers who previously worked in Saudi Arabia. Up until 2019, 2,494 cases have been reported, including 858 deaths.

Infectious Disease Since Last Update

2014 – Ebola: Ebola was found in Africa near the Ebola River in 1976, but the outbreak that recently caught the world’s attention started in Guinea before spreading to neighboring countries, with the highest cases in Sierra Leone of 14,124 and 3,956 deaths. Ebola reached the U.S. but only recorded four cases and one fatality, and in 2015 the CDC announced a vaccine against the disease. The most recent outbreaks of Ebola occurred in the Democratic Republic of Congo in 2018.

2016 – Zika Virus: The most at threat potential victims for this mosquito-transmitted disease are pregnant women, whom if bitten, their pregnancy could result in stillbirth, preterm birth, or fetal loss. In November of 2016, 84 countries were reported to have Zika virus cases in the Americas, with the first cases reported in Brazil, then spreading in high numbers to New York, Florida, and Texas.

2020 – COVID-19: On Jan. 30, the World Health Organization declared a “public health emergency of international concern” for the new coronavirus, COVID-19, originating from Wuhan, Hubei Province in China. Like SARS and MERS, this virus originates from certain animals before infecting humans, and has spread quickly. The confirmed locations of the virus’ presence are in Asia, the U.S., Canada, Australia, Europe, and Russia.

In March of 2020, the first case of COVID-19 was reported in Texarkana and Bowie County issued a shelter in place order. Public and private gatherings were prohibited, and all Bowie County Independent School Districts were closed. Many restaurants stayed open providing to-go option only and some could not maintain and closed. In July of 2020 the Governor of Texas issued an Executive Order requiring every person in Texas to wear a face covering over the nose and mouth when inside a commercial entity or other building or space open to the public.

Probability of Future Occurrence

As people began to gather and congregate in urban areas, the potential for pandemics and epidemics increased. The ease of global travel increases how quickly the viruses and bacteria can spread. The population of the City of Texarkana is vulnerable to disease outbreaks, and the probability of future infectious disease or pandemic events is possible. The probability of an infectious disease epidemic or pandemic in the City of Texarkana is likely considering the ongoing cases of COVID-19 still being reported.

Vulnerability

The City of Texarkana is vulnerable to infectious disease. Gathering in places where a lot of people are like restaurants and bars make the possibility of spreading an infection more likely. During the COVID-19

Pandemic stay at home orders were mandated to stop the spread of the disease. According to the Center for Disease Control and Prevention COVID Data Tracker data through July 2023 there have been a total of 6,202,800 hospitalizations and 1,134,300 deaths in the United States related to COVID-19.

Impact

Lost wages for those who contracted the disease as well as medical costs are key impacts of another pandemic. Critical facilities may not be maintained due to absenteeism of employees or the closing of facilities. Emergency services and Utility services could be limited by an infectious disease event. The response costs and the impact to health for people in the City of Texarkana could be major. The effects of climate change, changes in population and changes in land development are not expected to affect the impact of an infectious disease event.

INFECTIOUS DISEASE RISK					
COMMUNITY	POTENTIAL IMPACT 45%	PROBABILITY 30%	Warning 15%	Duration 10%	RISK
City of Texarkana	Substantial PRI=4	Likely PRI=3	>24 hrs. PRI=1	>1 week PRI=1	High 3.25

Mitigation Project Ideas:

Increase public awareness of CDC guidelines on preventing the spread of infection.

Lightning

Description

Lightning results from the buildup and discharge of electrical energy between positively and negatively charged areas within thunderstorms. A “bolt” or brilliant flash of light is created when the buildup becomes strong enough. These bolts of lightning can be seen in cloud-to-cloud or cloud-to-ground strikes. Bolts of lightning can reach temperatures approaching 50,000°F. While lightning is mostly affiliated with thunderstorms, lightning often strikes outside of these storms, as far as 10 miles away from any rainfall. FEMA states that an average of 300 people are injured and 80 people are killed in the United States each year by lightning. Direct strikes have the power to cause significant damage to buildings, critical facilities, infrastructure, and the ignition of wildfires which can result in widespread damage to property and persons. Lightning is the most significant natural contributor to fires affecting the built environment.

The National Lightning Safety Institute defines the following forms of lightning:

Direct Strike - This is the most dangerous hazard, wherein the person or structure is in a direct path for lightning currents. The magnitude of the current determines its effects. A typical amperage of 20kA acting on a ground of 10 ohms creates 200,000V. A large strike can attain 150kA levels. More than 50 volts will drive a potentially lethal current through the body.

Side Strike - This hazard results from the breakup of the direct strike when alternate parallel paths of current flow into the ground via a person or structure. When the initial current path offers some resistance to current flow, a potential above ground current develops and the person or structure's resistance to ground becomes the alternate path of conduction.

Conducted Strike - This hazard occurs when lightning strikes a conductor which in turn introduces the current into an area some distance from the ground strike point. Unprotected connected equipment can be damaged, and personnel injured if they become an indirect path in the completion of the ground circuit.

Structure Voltage Gradient - Current passing through two or more structures create momentary voltage differential. Poor interconnect bonding may cause a completed circuit potential difference. The same hazard is created, for example, by a person touching an ungrounded object while the person is grounded. The electrical circuit is completed through the person, sometimes with fatal consequences.

Induced Effects - Lightning can induce electric field and magnetic field coupling into structures and into wiring. Magnetic coupling is transformer action, and the common laws for transformers prevail.

Streamer Conductor - The streamer hazard occurs when a lightning leader influences electric behavior of objects on the Earth. Even streamers which do not become a part of the main channel can contain significant amounts of current. Streamer current exposure can affect people and sensitive electronics.

Sequelae - These secondary effects are many. Forest and grass fires, explosive steam conditions in masonry, trees and other water-bearing objects, and consequences of the thunderclap startling a person into inadvertently throwing a switch are examples.

Step Voltage/Touch Voltage - This hazard occurs as a result of a lightning strike dissipating its energy through the ground. The ground current creates a voltage drop across the surface of the Earth. A person standing within several hundred feet from the lightning strike point can have several hundred volts

generated between their feet. This hazard is identical to a person being grounded while touching two live wires, one with each hand.

The lightning activity level (LAL) is a common parameter that is part of fire weather forecasts nationwide.

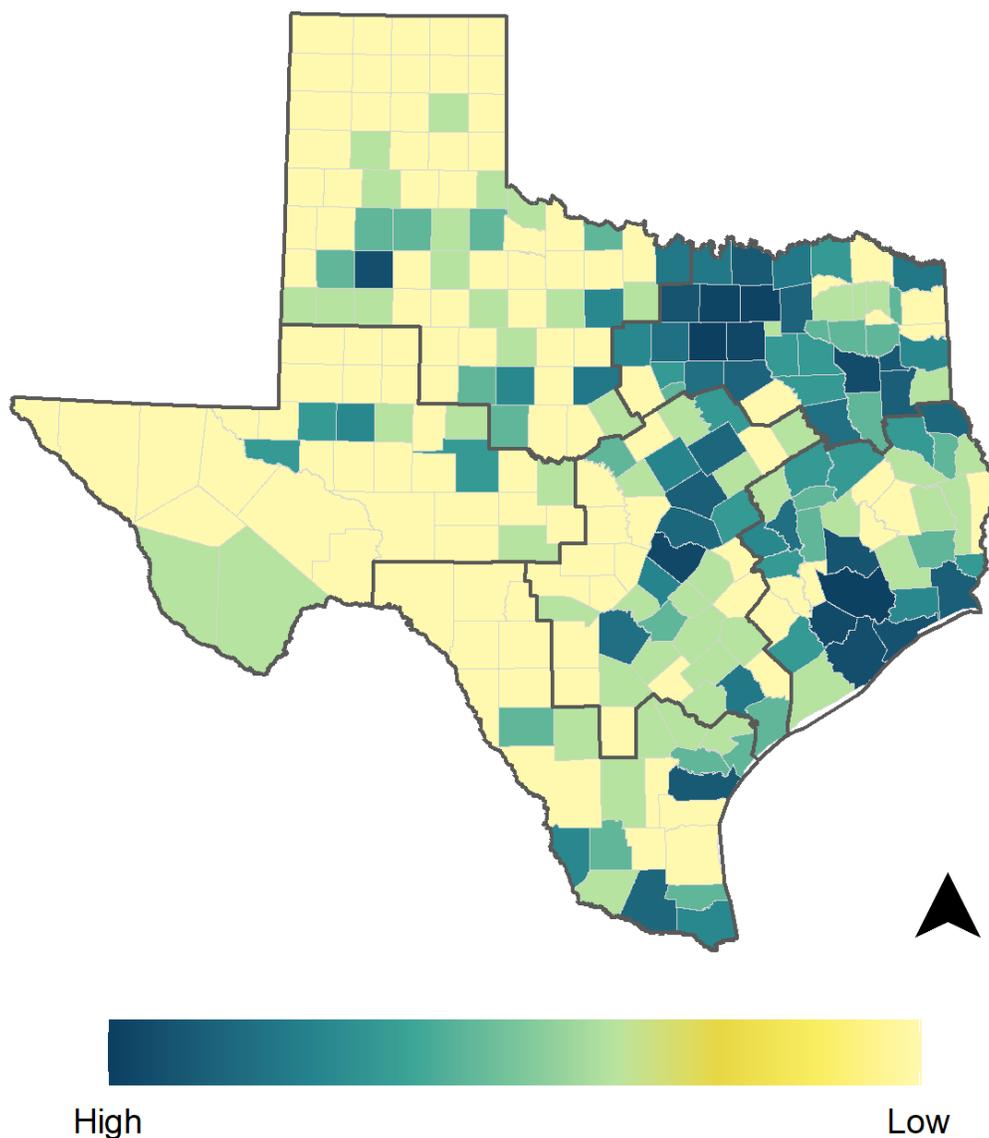
LAL is a measure of the amount of lightning activity using values 1 to 6

LAL	Cloud and Storm Development	Lightning Strikes Per 15 Minutes
1	No thunderstorms	-
2	Cumulus clouds are common but only a few reaches the towering cumulus stage. A single thunderstorm must be confirmed in the observation area. The clouds produce mainly virga, but light rain will occasionally reach the ground. Lightning is very infrequent	1-8
3	Towering cumulus covers less than two-tenths of the sky. Thunderstorms are few, but two to three must occur within the observation area. Light to moderate rain will reach the ground and lightning is infrequent	9-15
4	Towering cumulus covers two to three-tenths of the sky. Thunderstorms are scattered and more than three must occur within the observation area. Moderate rain is common, and lightning is frequent	16-25
5	Towering cumulus and thunderstorms are numerous. They cover more than three-tenths and occasionally obscure the sky. Rain is moderate to heavy and lightning is frequent and intense	>25
6	Similar to LAL 3 except thunderstorms are dry	

Location

Lightning can strike in any geographic location and is considered a common occurrence in Texas. The Texarkana planning area is susceptible to lightning strikes. Therefore, lightning could occur at any location within Texarkana. According to the 2023 SHMP, the entire state of Texas is subject to lightning strikes and is in a region of the country that is considered highly susceptible to lightning.

Lightning: Historic Events by County



Source: National Center for Environmental Information Storm Events Database
<https://ncdc.noaa.gov/stormevents/>

Source: 2023 SHMP

Extent (Severity)

According to the NOAA, the average number of cloud-to-ground flashes for the State of Texas between 2007 and 2016 was 11.3 flashes per square mile. The National Lightning Detection Network lightning flash density map shows a range of up to eighteen to twenty-one cloud-to-ground lightning flashes per square mile per year for Bowie County. The power of lightning can run the full extent of the Lightning Activity Level (LAL 1-LAL 6).

Source: 2022 Bowie County HMP

Estimated Property Loss at 15%		
City of Texarkana	Residential	\$186,138,129

Previous Occurrence

According to the National Centers for Environmental Information (NCEI) storms database, 0 events were reported between 01/01/2011 and 08/31/2023 (4626 days)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	0.00K	0.00K

While no data exists for lightning strikes in the National Centers for Environmental Information (NCEI) storms database, Texarkana and the surrounding area have had multiple lightning strikes that have caused property damage.

March 31, 2021, lightning activity in Texarkana during a severe storm according to KTBS 3 news.



Source: KTBS 3 Facebook page

May 2, 2019 cloud to ground lightning struck and destroyed the Texarkana Texas Environmental Building at the TWU Plant on South Stateline.



Source: TTPD Facebook page



According to the Texarkana Gazette, on July 4, 2011, lightning strike sparks housefire in Texarkana, Texas.

Lightning from a sudden thunderstorm sparked a house fire Sunday afternoon in Texarkana, Texas.

No one was injured as neighbors and emergency personnel escorted the three-elderly people inside the house at 2 Evergreen Lane to safety.

Texarkana Fire Capt. Gary Green said lightning struck a pine tree behind the house, then followed the power line into the attic where the fire originated.

Margaret Coleman and her visiting sister, Susie Evans, were standing in the hallway of the home when the lightning struck a few minutes

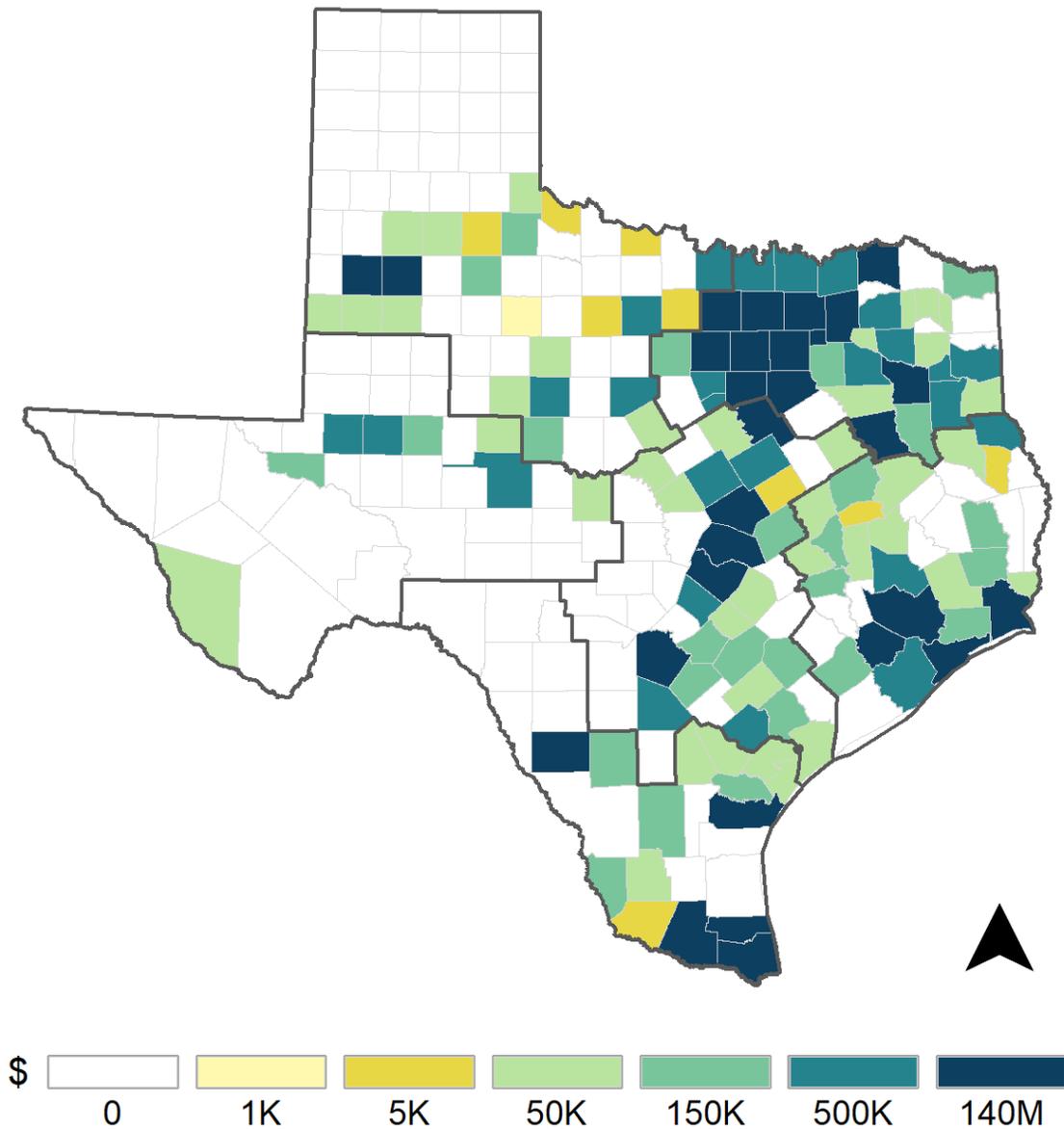
before 5 p.m. Also, inside the house was Hugh Coleman, Margaret's husband.

"I heard a loud boom," Margaret Coleman said. "Didn't know it hit the house."

Roland Dixon lives on Palm Drive behind the Colemans and reported hearing a "big boom." "I looked out my door; I saw smoke," Dixon said. Dixon said he then rushed over to the home to try and help.

Joni Newton was across the street at her mom's house when the bolt of lightning struck. Newton said she ran across the street and banged on the door and yelled for anyone inside to get out. Newton also called 911.

A map from the 2023 SHMP shown below illustrates historical losses from lightning over the period 2000 thru 2021. Bowie County had \$150,000 in lightning costs.



Source: National Center for Environmental Information Storm Events Database
<https://ncdc.noaa.gov/stormevents/>

Source: 2023 SHMP

Probability of Future Occurrence

According to the FEMA National Risk Index, Bowie County has a Very Low Risk for Lightning. Based on historical records and input from the planning team the probability of occurrence for future lightning events in the City of Texarkana are likely, including damage to a building or a critical facility.

Lightning will strike far more frequently in a world under climate change – but researchers can still not predict exactly where or when those strikes will occur. New research from the University of California,

Berkeley, found warming conditions would result in 50% more lightning strikes by the end of the century. (theguardian.com)

Vulnerability

Texas leads the nation in the number of annual lightning strikes. During a thunderstorm lightning may strike anywhere in Bowie County.

Impact

Although there is limited data regarding recorded deaths or monetary losses due to lightning in the City of Texarkana the probability of death and property loss remains possible. The effects of climate change, changes in population and changes in land development are not expected to affect the impact of a lightning event.

LIGHTNING RISK					
COMMUNITY	POTENTIAL IMPACT 45%	PROBABLITY 30%	Warning 15%	Duration 10%	RISK
City of Texarkana	Limited PRI=1	Highly Likely PRI=4	<6 hrs. PRI=4	<6 hrs. PRI=1	Medium 2.35

Mitigation Project Ideas:

- Protect critical facilities and equipment
- Conduct lightning awareness programs

Source: FEMA Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards

Severe Winds (High Wind, Thunderstorm Wind, Strong Wind)

Description

Severe winds such as the widespread, long-lived, straight-line wind events (derechos) can occur alone or sometimes accompany other natural hazards including hurricanes and severe thunderstorms. This section evaluates winds occurring with severe thunderstorms, high winds, and strong winds. Severe winds pose a threat to lives, property, and vital utilities primarily due to the effects of flying debris, downed trees, and interactions with power lines. The most damage severe winds cause is to structures of light construction, particularly manufactured homes.

Sometimes people think that a tornado has struck because the straight-line winds can be as powerful as a strong tornado, but straight-line winds do not spin. Straight-line winds are often responsible for the wind damage associated with a thunderstorm. Downbursts or micro-bursts are examples of damaging straight-line winds. A downburst is a small area of rapidly descending rain and rain-cooled air beneath a thunderstorm that produces a violent, localized downdraft covering 2.5 miles or less. Wind speeds in some of the stronger downbursts can reach 100 to 150 miles per hour, which is similar to that of a strong tornado. The winds produced from a downburst often occur in one direction and the worst damage is usually on the forward side of the downburst.

The following Beaufort Wind Chart shows the description and scale used to classify the wind intensity in a thunderstorm. The scale is now rarely used by professional meteorologists, having been largely replaced by more objective methods of determining wind speeds—such as using anemometers, tracking wind echoes with Doppler radar, and monitoring the deflection of rising weather balloons and radiosondes from their points of release. Nevertheless, it is still useful in estimating the wind characteristics over a large area, and it may be used to estimate the wind where there are no wind instruments. The Beaufort scale also can be used to measure and describe the effects of different wind velocities on objects on land or at sea.

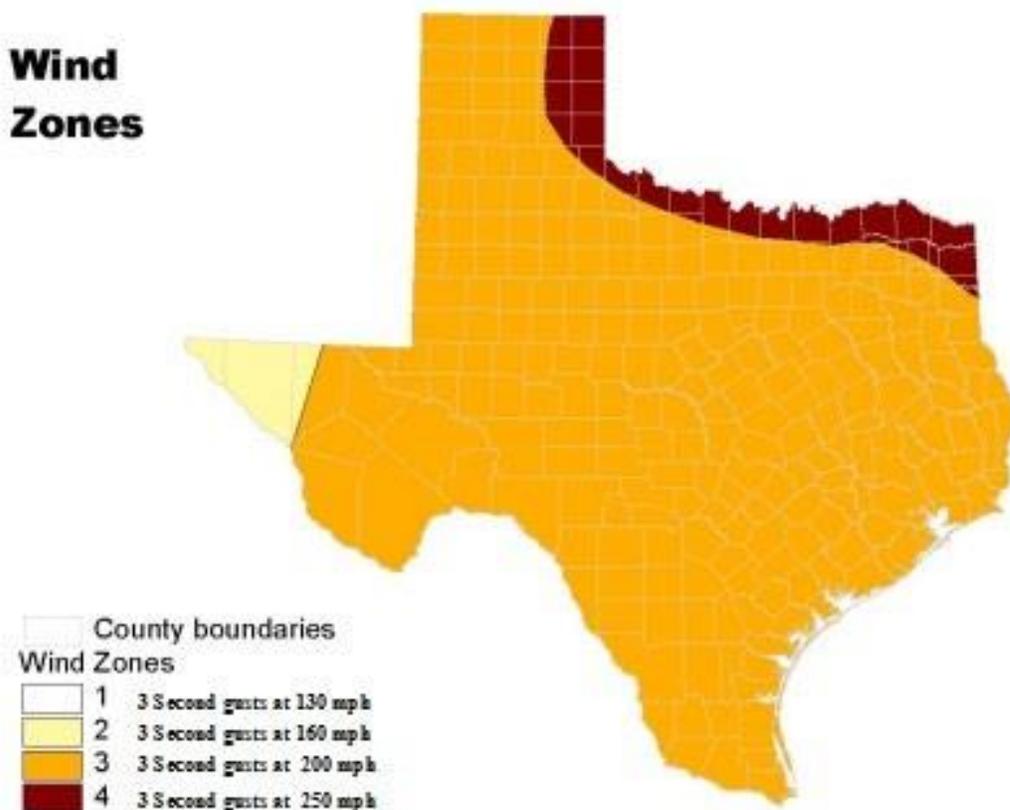
The Beaufort Scale of Wind (Nautical)			
Beaufort Number	Name of Wind	Wind Speed	
		knots	knots per hour
0	Calm	<1	<1
1	Light air	1–3	1–5
2	Light breeze	4–6	6–11
3	Gentle breeze	7–10	12–19
4	Moderate breeze	11–16	20–28
5	Fresh breeze	17–21	29–38
6	Strong breeze	22–27	39–49
7	Moderate gale (or near gale)	28–33	50–61
8	Fresh gale (or gale)	34–40	62–74
9	Strong gale	41–47	75–88
10	Whole gale (or storm)	48–55	89–102
11	Storm (or violent storm)	56–63	103–114
12–17	Hurricane	64 and above	117 and above

Location

According to the 2023 Texas State Hazard Mitigation Plan, the entire State of Texas is exposed to the threat of severe wind events. High winds are not geographically specific, and they may occur anywhere including Texarkana.

The windstorm risk is greatest in the northern regions (Regions 5 and 1). This area of Texas is most vulnerable to windstorms because there are not many trees there to provide a natural windbreak or barrier; however, the population density in these areas is low. In Region 1 where the population density is very high, the risk of occurrence is slightly less but still substantial.

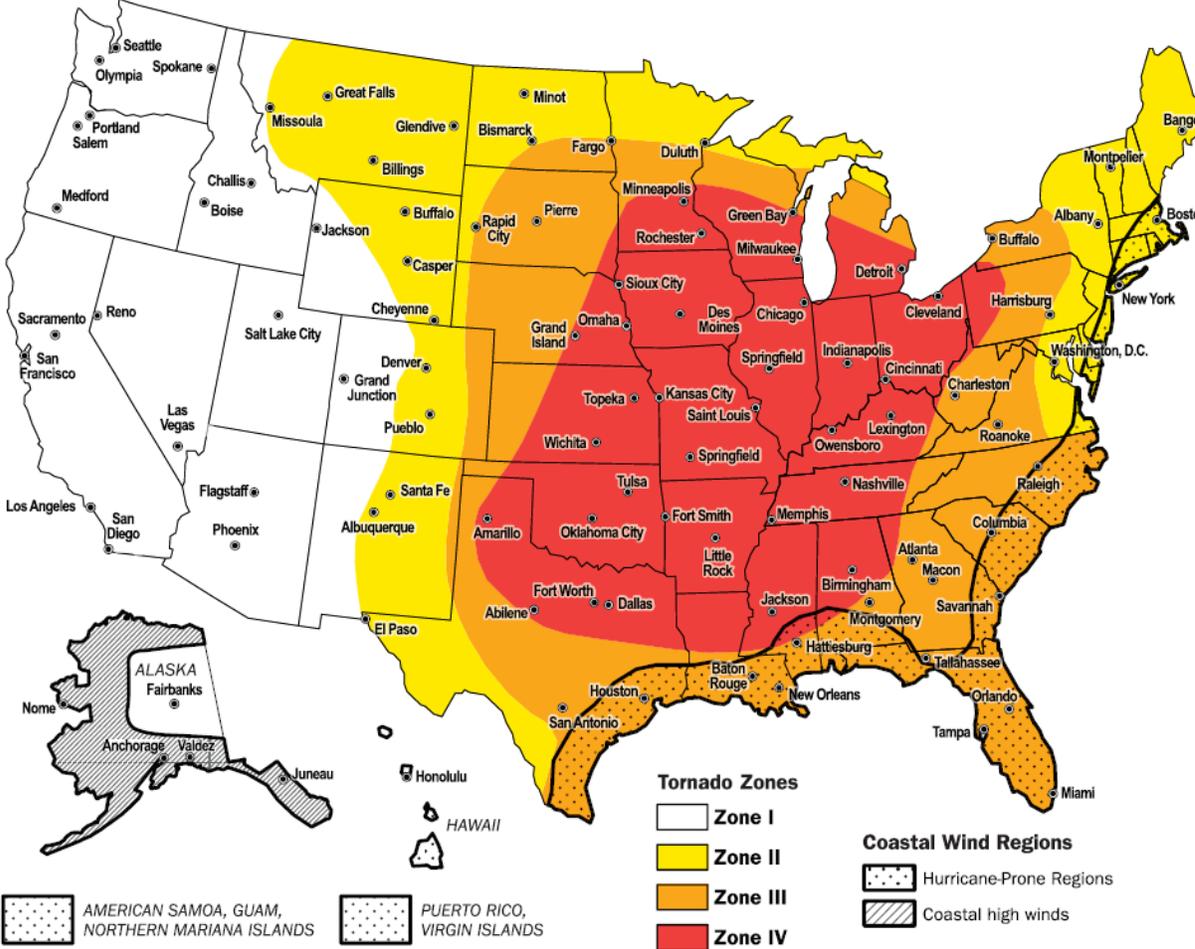
Location of Severe Wind Zones in Texas



Source: Texas Division of Emergency

According to the FEMA Winds Zones of the United States map, the City of Texarkana is located in Wind Zones IV, where wind speeds can reach up to 250 mph. The map below illustrates wind zones across the United States, which indicate the impacts of the strength and frequency of wind activity per region.

FEMA Wind Zones in the United States



Source: 2023 SHMP

Extent (Severity)

There were no reported injuries and no deaths from thunderstorm wind events in Bowie County. Storms cause power outages, disruptions of transportation and property damage. Historical data indicates that the entire county is susceptible to windstorms with a Beaufort Scale rating of 10 during the thunderstorm season, and depending on the severity, costs will vary. In the last ten years there have been over one million dollars in property destruction reported due to Thunderstorm Winds.

Estimated Property Loss at 15%	
Texarkana	\$266,098,032

Previous Occurrence

According to the National Centers for Environmental Information (NCEI) storms database, 12 events were reported in Texarkana, Texas between 01/01/2011 and 08/31/2023 (4626 days)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
SOUTH TEXARKANA	BOWIE CO.	TX	04/04/2011	07:45	CST-6	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
TEXARKANA	BOWIE CO.	TX	04/15/2011	00:10	CST-6	Thunderstorm Wind	53 kts. EG	0	0	0.00K	0.00K
TEXARKANA	BOWIE CO.	TX	04/15/2011	00:10	CST-6	Thunderstorm Wind	53 kts. EG	0	0	0.00K	0.00K
TEXARKANA	BOWIE CO.	TX	04/03/2012	18:35	CST-6	Thunderstorm Wind	53 kts. EG	0	0	0.00K	0.00K
TEXARKANA	BOWIE CO.	TX	06/12/2012	02:35	CST-6	Thunderstorm Wind	53 kts. EG	0	0	40.00K	0.00K
TEXARKANA	BOWIE CO.	TX	06/12/2012	02:40	CST-6	Thunderstorm Wind	56 kts. EG	0	0	40.00K	0.00K
SOUTH TEXARKANA	BOWIE CO.	TX	04/10/2013	13:10	CST-6	Thunderstorm Wind	52 kts. EG	0	0	1.00K	0.00K
TEXARKANA	BOWIE CO.	TX	05/09/2015	19:10	CST-6	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
SOUTH TEXARKANA	BOWIE CO.	TX	04/11/2016	11:10	CST-6	Thunderstorm Wind	61 kts. EG	0	0	0.00K	0.00K
SOUTH TEXARKANA	BOWIE CO.	TX	07/03/2018	16:00	CST-6	Thunderstorm Wind	61 kts. EG	0	0	0.00K	0.00K
SOUTH TEXARKANA	BOWIE CO.	TX	03/27/2021	18:05	CST-6	Thunderstorm Wind	61 kts. EG	0	0	0.00K	0.00K
SOUTH TEXARKANA	BOWIE CO.	TX	04/04/2022	22:22	CST-6	Thunderstorm Wind	56 kts. MG	0	0	0.00K	0.00K

Probability of Future Events

According to the FEMA National Risk Index, Bowie County has a Relatively Moderate Risk for Strong Wind Exposure. Given the climate and history, thunderstorms are highly likely during the storm season. Thunderstorms and their accompanying high winds are most prolific in the spring and summer months; however, they may occur at any time in Bowie County given the right conditions.

With increasing global surface temperatures, the possibility of more droughts and increased intensity of storms will likely occur. As more water vapor is evaporated into the atmosphere it becomes fuel for more powerful storms to develop. (usgs.gov)

Vulnerability

The City of Texarkana, Texas is susceptible to damage from thunderstorm winds. Microbursts and downbursts produce winds severe enough to be mistaken for tornadoes. The entire county is vulnerable to high winds associated with thunderstorms.

Impact

All people and assets in the City of Texarkana are considered to have the same degree of exposure to the severe thunderstorm/high wind hazard. Within the City, the risk to people and property from the high wind hazard cannot be distinguished by area; over time, the hazard is expected to have a relatively uniform probability of occurrence across the entire City.

Potential impacts from thunderstorms include:

- Property damage to fences, vehicles, equipment, and roofs
- Transportation delays

- Injury or death
- Electrical grid problems
- Power outage
- Communication problems – phone and internet lines down
- Natural environment damage, to include protected species and critical habitats
- Property damage
- Crop damage
- Fire- caused by lightning
- Blocked roadways from trees and damaged property

Although most new homes and buildings in the jurisdiction are built to resist the effects of all but the strongest thunderstorms, several mobile and manufactured home parks and vehicles remain vulnerable. Thousands of homes and vehicles can be damaged by high winds, hail, and lightning in a single storm, causing millions of dollars in damage. The effects of climate change, changes in population and changes in land development are not expected to affect the impact of a severe wind event.

SEVERE WINDS RISK					
COMMUNITY	POTENTIAL IMPACT 45%	PROBABILITY 30%	Warning 15%	Duration 10%	RISK
City of Texarkana	Minor PRI=2	Highly Likely PRI=4	6-12 hrs. PRI=3	<6 hrs. PRI=1	Medium 2.65

Mitigation Project Ideas

- Adopt and enforce building codes
- Promote or require site and building design standards to minimize wind damage
- Assess vulnerability to severe wind
- Protect power lines and infrastructure
- Retrofit residential buildings
- Retrofit public buildings and critical infrastructure
- Increase severe wind risk awareness

Source: FEMA Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards

Severe Winter Weather (Sleet, Ice Storm, Blizzard, Frost/Freeze, Heavy Snow)

Description

Severe winter weather includes heavy snow and blizzards, sleet, ice storms (or freezing rain), frost/freeze or a mix of these. Severe winter weather can down trees, cause widespread power outages, damage property, and cause fatalities and injuries. The effect of severe winter storms on Texas is quite disruptive compared to other regions that normally experience severe winter weather.

Extreme cold that often accompanies severe winter storms can also be independent of a storm. For this reason, extreme cold is profiled separately.

A heavy snowfall for the state is an accumulation of four or more inches of snow in a 12- hour period. This amount of snow accumulation usually occurs in the northern half of the state and in the higher elevations of West Texas. South of the line from Del Rio to Port Arthur snow is rare.

Blizzards are the most perilous of all winter storms, characterized by low temperatures and strong winds in excess of 35 mph, bearing large amounts of blowing or drifting snow. Blizzards take a terrible toll in livestock and people caught in the open. In Texas, blizzards are most likely to occur in the Panhandle and South Plains Regions.

An ice storm occurs when rain falls out of the warm upper layers of the atmosphere into a cold and dry layer near the ground. The rain freezes on contact with the cold ground and accumulates on exposed surfaces. Damage can occur with half an inch of rain freezing on trees and utility wires; the damage increases if there are high winds. Based on this, an icing event is categorized an ice storm at half an inch.

The following Sperry-Piltz Ice Accumulation Index was used to determine the extent of winter conditions:

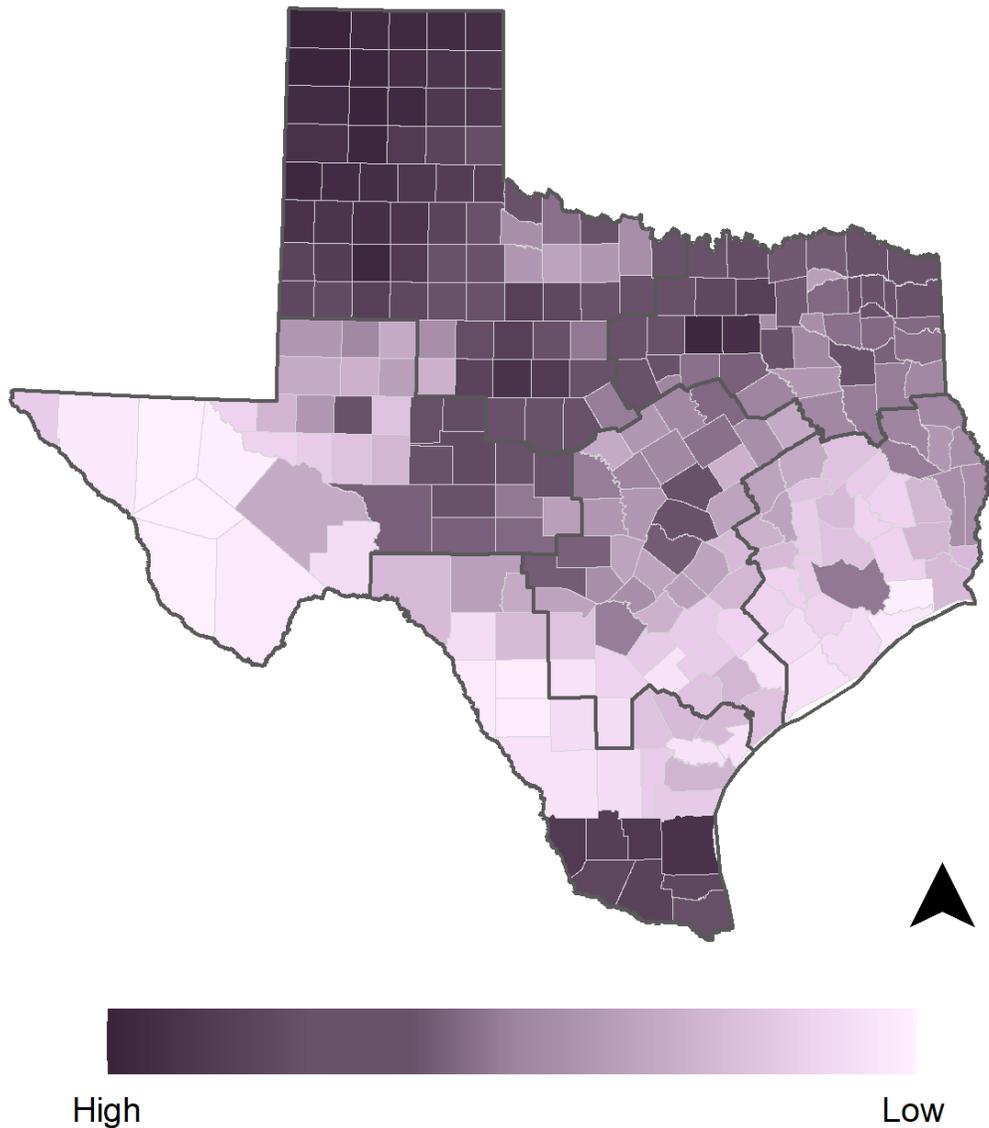
Weather Conditions and SPIA Index Levels at a Glance:

Ice and Wind: Radial Ice in Inches; Wind in Miles per Hour.	< 15 mph	15-25 mph	25-35 mph	>= 35 mph
0.10 – 0.25 inches	0	1	2	3
0.25 – 0.50 inches	1	2	3	4
0.50 – 0.75 inches	2	3	4	5
0.75 – 1.00 inches	3	4	5	5
1.00 – 1.50 inches	4	5	5	5
> 1.50 inches	5	5	5	5

Location

According to the 2023 SHMP, winter weather can happen anywhere in the state, the Texas Panhandle and North Central Texas around Dallas and Texarkana are most vulnerable to severe winter storms. These areas are better prepared for severe winter weather than warmer, southern portions of the state.

Historic Events by County



Source: National Center for Environmental Information Storm Events Database
<https://ncdc.noaa.gov/stormevents/>

Source: SHMP

Extent (Severity)

The magnitude or severity of a severe winter storm depends on several factors, including a region’s climatological susceptibility to snowstorms, snowfall amounts, snowfall rates, wind speeds, temperatures, visibility, storm duration, topography, time of occurrence during the day and week (e.g., weekday versus weekend), and time of season.

The extent of a severe winter storm can be classified by meteorological measurements and by evaluating its societal impacts. The National Oceanic and Atmospheric Administration’s (NOAA’s) National Climatic Data Center (NCDC) is currently producing the Regional Snowfall Index (RSI) for significant snowstorms that impact the eastern two-thirds of the United States. The RSI ranks snowstorm impacts on a scale from 1 to 5 and is based on the spatial extent of the storm, the amount of snowfall, and the interaction of the extent and snowfall totals with population (based on the 2000 Census). The NCDC has analyzed and assigned RSI values to over 500 storms since 1900 (NOAA 2015).

RSI Ranking Categories

Category	Description	RSI Value
1	Notable	1–3
2	Significant	3–6
3	Major	6–10
4	Crippling	10–18
5	Extreme	18.0+

Source: NOAA 2015

The NWS operates a widespread network of observing systems, such as geostationary satellites, Doppler radars, and automated surface observing systems that feed into the current state-of-the-art numerical computer models to provide a look into what will happen next, ranging from hours to days. The models are then analyzed by NWS meteorologists who then write and disseminate forecasts (NWS 2013).

According to NWS (2009), the magnitude of a severe winter storm can be qualified into five main categories by event type:

- Heavy Snowstorm – snowfall accumulating to 4 inches or more in 12 hours or less or snowfall accumulating to six inches or more in 24 hours or less.
- Sleet Storm – Significant accumulations of solid pellets that form from the freezing of raindrops or partially melted snowflakes causing slippery surfaces, posing a hazard to pedestrians and motorists.
- Ice Storm – Significant accumulation of rain or drizzle freezing on objects (trees, power lines, roadways) as it strikes them, causing slippery surfaces and damage from sheer weight of ice accumulations; significant ice accumulations are usually ¼” or greater.
- Blizzard – sustained winds or frequent gusts of 35 mph or more; considerable blowing snow with visibility frequently below one-quarter mile prevailing over an extended period.
- Severe Blizzard – Wind velocity of 45 mph, temperatures of 10°F or lower, a high density of blowing snow with visibility frequently measured in feet prevailing over an extended period.

The NWS uses winter weather watches, warnings, and advisories to ensure that people know what to expect in the coming hours and days.

- **Watches**

- Blizzard – Conditions are favorable for blizzard conditions to be met in the next 12 to 48 hours.
- Winter Storm - Issued when winter storm conditions, defined above, are possible within 24 to 48 hours.

- **Warnings**

- Blizzard – Issued when sustained winds or frequent gusts ≥ 35 mph combined with blowing and or falling snow, reducing visibility below 1/4 mile for 3 hours or more, when imminent or expected within the next 36 hours. Temperatures are assumed to be below 32°F, and snow should accumulate at least one inch in 12 hours.
- Winter Storm - Issued when the following conditions, capable of producing high impact and potentially life-threatening conditions, are occurring or expected to occur within the 36 hours:
snow - ≥ 1 inch in 12 hours; sleet - $\geq 1/2$ inch in 12 hours; and or a combination of snow, sleet, ice with snow or sleet meeting warning criteria
- Ice Storm - Issued when $\geq 1/8$ inch of Ice is expected to accrete on trees, power lines, and bridges/overpasses for the entirety of the event. These conditions are capable of producing high impact and potentially life-threatening conditions and are either occurring or expected to occur within the next 36 hours.

- **Advisories**

- Winter Weather - Issued when the following conditions, capable of producing significant, but not necessarily life threatening, inconveniences, are occurring or expected to occur within the next 36 hours:
 - ✦ Snow: 1/2 to 1 inch in 12 hours
 - ✦ Sleet: $< 1/2$ inch in 12 hours
 - ✦ Ice: $< 1/8$ inch in 12 hours
 - ✦ Combination: Snow, sleet, and ice with snow or sleet meeting advisory criteria.

Estimated Property Loss at 15%	
Texarkana	\$266,098,032

Previous Occurrence

Many sources have provided historical information regarding previous occurrences and losses associated with severe winter storm events in Bowie County and the City of Texarkana. According to the NOAA-NCEI storm events database, Bowie County has been impacted by seven winter weather events between 1950 and 2022.

According to the National Centers for Environmental Information (NCEI) storms database, 26 events were reported in Bowie County between 01/01/2011 and 08/31/2022 (4261 days)

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	1.000M	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	02/03/2022	00:00	CST-6	Winter Weather		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	01/15/2022	15:58	CST-6	Winter Weather		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	02/16/2021	18:00	CST-6	Winter Storm		0	0	1.000M	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	02/14/2021	00:00	CST-6	Winter Storm		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	02/14/2021	00:00	CST-6	Cold/wind Chill		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	01/10/2021	14:00	CST-6	Winter Weather		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	01/22/2020	00:00	CST-6	Winter Weather		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	02/11/2018	13:15	CST-6	Winter Weather		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	01/15/2018	22:00	CST-6	Winter Storm		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	01/06/2017	10:00	CST-6	Winter Weather		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	03/04/2015	22:00	CST-6	Winter Storm		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	02/25/2015	01:00	CST-6	Winter Storm		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	02/23/2015	08:00	CST-6	Winter Storm		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	01/11/2015	00:00	CST-6	Winter Weather		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	03/02/2014	15:00	CST-6	Winter Storm		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	02/11/2014	15:00	CST-6	Winter Weather		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	02/07/2014	12:00	CST-6	Winter Weather		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	02/04/2014	02:00	CST-6	Winter Weather		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	01/05/2014	16:00	CST-6	Cold/wind Chill		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	12/06/2013	00:00	CST-6	Winter Weather		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	11/24/2013	16:00	CST-6	Winter Weather		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	01/15/2013	06:00	CST-6	Winter Weather		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	12/25/2012	16:00	CST-6	Winter Storm		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	02/09/2011	04:00	CST-6	Winter Weather		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	02/03/2011	22:00	CST-6	Winter Storm		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	01/09/2011	07:00	CST-6	Winter Storm		0	0	0.00K	0.00K
Totals:								0	0	1.000M	0.00K

Probability of Future Occurrence

According to the FEMA National Risk Index, Bowie County has a Relatively High Risk for Ice Storm and a Relatively Moderate Risk for Winter Weather. Considering there was at least one occurrence of severe winter weather in ten of the last twelve years makes the probability of a future occurrence high for the City of Texarkana.

The Arctic is warming twice as fast as the rest of the world. As it warms, climate scientists are increasingly concerned that this can have significant implications for the jet stream, and cold arctic air is being pushed into areas that are not prepared for these conditions. (hsph.harvard.edu)

Vulnerability

All areas of the City of Texarkana are vulnerable to the effects of severe winter weather. When severe winter weather occurs, people are unable to report to work due to icy road conditions. Frozen or downed power lines could leave citizens without power for a significant amount of time. The low income and homeless population have the greatest risk during severe winter weather.

Impact

In February of 2021 a very cold, arctic air mass continued to deepen as it shifted south across Northeast Texas on February 14th-15th, ahead of a large upper trough that traversed east across the Southern Plains. Areas of heavy snow were observed across much of Central and North Texas. Widespread snow and sleet amounts ranged from 5 to 10 inches across East and Northeast Texas, Texarkana reported 10 inches of accumulated snow/sleet from this winter storm.

February 15, 2021



On the heels of the first winter storm and historically cold temperatures observed earlier in the week, a second significant winter storm developed February 16th-17th, with areas of snow (some heavy) falling across Northeast Texas.

When combined with the previous winter storm on the 14th-15th, widespread snowfall totals of ten to fifteen inches were observed across counties in Northeast Texas. These totals crippled the region, making driving nearly impossible, with rolling blackouts further aggravated by the additional power outages. In addition, the weight of the snow from these two back-to-back winter storms also resulted in numerous metal carport canopies collapsing across extreme with many homes and cars damaged. One million dollars in property damage was reported.

Potential impacts from winter storms include:

- Structure and infrastructure damage
- Injury or death
- Power outages
- Loss of ability to use roads for driving

- Increased traffic accidents
- Loss of heat
- Stranded travelers / motels at full capacity
- Tree debris create fuel load for fire hazard
- Delayed emergency response time
- Frozen/ busted pipes leading to loss of water
- Impacts to the economy
- Communication capabilities decrease

The effects of climate change, changes in population and changes in land development are not expected to affect the impact of a severe winter weather event.

SEVERE WINTER WEATHER RISK					
COMMUNITY	POTENTIAL IMPACT 45%	PROBABLITY 30%	Warning 15%	Duration 10%	RISK
City of Texarkana	Minor PRI = 2	Highly Likely PRI = 4	> 24 hrs. PRI = 1	< a week PRI = 3	Medium 2.55

Mitigation Project Ideas:

- Adopt and enforce of building codes
- Protect buildings and infrastructure
- Protect powerlines
- Reduce impacts to roadways
- Conduct winter weather risk awareness activities
- Assist vulnerable populations

Source: FEMA Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards

Tornadoes

Description

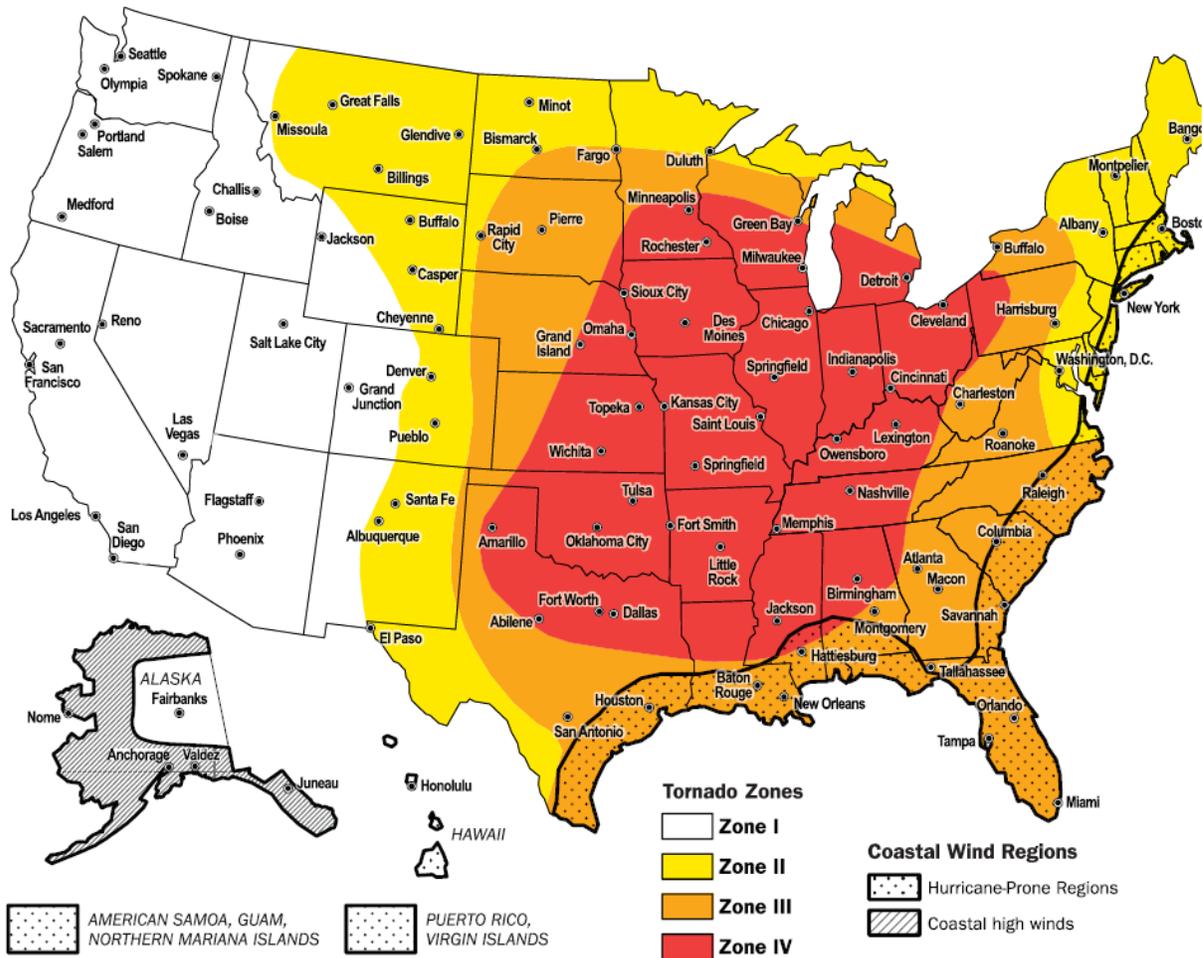
A tornado is a violently rotating column of air that has contact with the ground and is often visible as a funnel cloud. The destruction caused by tornadoes ranges from light to catastrophic depending on the intensity, size, and duration of the storm. Typically, tornadoes cause the greatest damage to structures of light construction, including residential dwellings and particularly manufactured homes. The month of May sees the most tornadoes in Texas, followed by April then June. This is because the warm humid spring air and cold winter jet stream creates the perfect mix of weather patterns that twisters thrive in.

Location

According to the 2023 Texas State Hazard Mitigation Plan, all regions of Texas are affected by tornadoes. Similar to that of thunderstorms, tornadoes do not have any specific geographic boundary and can occur anywhere in the City.

According to the FEMA Winds Zones of the United States map, the City of Texarkana is located in Wind Zones IV, where wind speeds can reach up to 250 mph. The map below illustrates wind zones across the United States, which indicate the impacts of the strength and frequency of wind activity per region.

FEMA Wind Zones in the United States



Extent (Severity)

Damage from tornadoes can vary from minor damage that break tree limbs to massive damage demolishing homes in its path. The type of damage depends on the intensity, size, and duration of the tornado. The severity of a tornado is categorized by the Enhanced Fujita Scale (EF Scale). As of February 2007, the EF Scale was adopted by the National Oceanic and Atmospheric Administration (NOAA) to replace the Fujita Scale (F Scale). The EF Scale is designed to be similar to the F Scale but has been revised to have a greater number of Damage Indicators, which are used to characterize the degree of damage experienced by buildings during a tornado. The table below illustrates the relationship between EF ratings, wind speed, and expected tornado damage.

Explanation of Enhance Fuji-Scale Ratings

EF Rating	Wind Speeds	Expected Damage	
EF-0	65-85 mph	'Minor' damage: shingles blown off or parts of a roof peeled off, damage to gutters/siding, branches broken off trees, shallow rooted trees toppled.	
EF-1	86-110 mph	'Moderate' damage: more significant roof damage, windows broken, exterior doors damaged or lost, mobile homes overturned or badly damaged.	
EF-2	111-135 mph	'Considerable' damage: roofs torn off well constructed homes, homes shifted off their foundation, mobile homes completely destroyed, large trees snapped or uprooted, cars can be tossed.	
EF-3	136-165 mph	'Severe' damage: entire stories of well constructed homes destroyed, significant damage done to large buildings, homes with weak foundations can be blown away, trees begin to lose their bark.	
EF-4	166-200 mph	'Extreme' damage: Well constructed homes are leveled, cars are thrown significant distances, top story exterior walls of masonry buildings would likely collapse.	
EF-5	> 200 mph	'Massive/incredible' damage: Well constructed homes are swept away, steel-reinforced concrete structures are critically damaged, high-rise buildings sustain severe structural damage, trees are usually completely debarked, stripped of branches and snapped.	

Source: NWS 2020

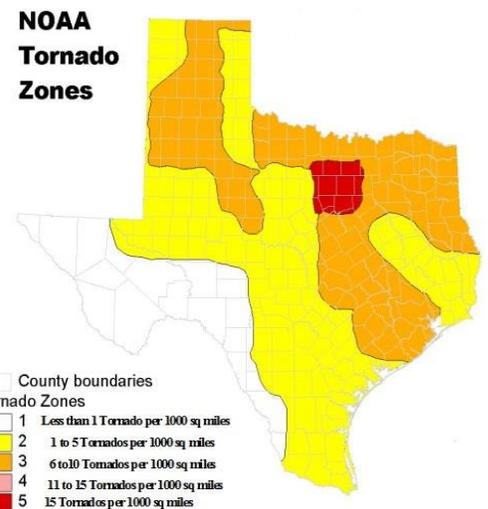
Estimated Property Loss at 50%	
City of Texarkana	\$886,993,440

Tornado Watch	Tornado Warning
<p>A tornado watch is issued by the NWS when conditions are favorable for the development of tornadoes in and close to the watch area. Their size can vary depending on the weather situation. Watches are typically issued for a duration of four to eight hours. They normally are issued well in advance of the actual occurrence of severe weather. During the watch, people should review tornado safety rules and be prepared to move to a place of safety if threatening weather approaches.</p>	<p>A tornado warning is issued by the local NWS office and will include where the tornado was located and what municipalities will be in its path. It is issued when a tornado is indicated by a radar or spotters, therefore, people in the affected area should seek safe shelter immediately. Warnings are issued for a duration of 30 minutes (NWS 2020). The current average lead time for tornado warnings is 13 minutes. Occasionally, tornadoes develop so rapidly that little, if any, advance warning is possible (NOAA 2011).</p>

Previous Occurrence

Bowie County, Texas is listed as high risk for tornadoes. The largest tornado in the Bowie County area was an F4 in 1971 that caused 5 injuries and 1 death. This F4’s tornado path is 5.1 miles long and 880 yards wide. There have been 114 tornados since 1950.

According to the 2023 SHMP, tornadoes do not have a specific geographic boundary as they can occur almost anywhere at any time if the conditions are right. Historically, tornados are not equally distributed across Texas and appear to occur more frequently in what is referred to as “Tornado Alley”, a line of activity that stretches from Central Texas, north into Oklahoma and beyond. Bowie County is located in the southern tip of “Tornado Alley.” Over the last 10 years, there have been 8 tornado events in Bowie County with no deaths recorded.



According to the National Centers for Environmental Information (NCEI) storms database, 8 events were reported in Bowie County between 01/01/2011 and 08/31/2022 (4261 days)

TORNADO											
Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
DALBY SPGS	BOWIE CO.	TX	04/03/2012	15:44	CST-6	Tornado	EF0	0	0	0.00K	0.00K
GARLAND	BOWIE CO.	TX	12/27/2015	15:06	CST-6	Tornado	EF0	0	0	15.00K	0.00K
SPRING HILL	BOWIE CO.	TX	05/09/2016	19:59	CST-6	Tornado	EF1	0	0	10.00K	0.00K
BEAVERDAMS	BOWIE CO.	TX	05/09/2016	20:06	CST-6	Tornado	EF1	0	0	0.00K	0.00K
COLLEGE HILL	BOWIE CO.	TX	01/21/2018	21:26	CST-6	Tornado	EF2	0	0	2.500M	0.00K
LIBERTY HILL	BOWIE CO.	TX	01/21/2018	21:43	CST-6	Tornado	EF0	0	0	50.00K	0.00K
REDWATER	BOWIE CO.	TX	05/16/2020	14:38	CST-6	Tornado	EFU	0	0	0.00K	0.00K
WAMBA	BOWIE CO.	TX	05/16/2020	16:05	CST-6	Tornado	EF1	0	0	20.00K	0.00K

Tornadoes in Bowie County 2011-2021 Probability Severity

Fujita Scale	Tornados	Estimated Damage
EF0	3	\$65,000
EF1	3	\$30,000
EF2	1	\$2,500,000
EF3	0	\$0
EF4	0	\$0
EF5	0	\$0
EF unknown	1	\$0
Total	8	\$2,595,000

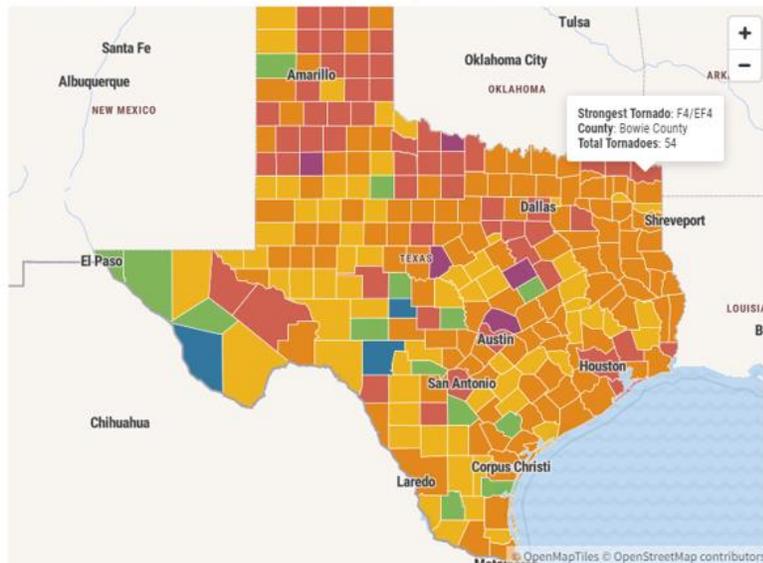
Source: Bowie County 2022 HMP

Tornadoes in Texas – Strongest per County

Tornadoes in Texas

Strongest per County (1950-2021)

Strongest Tornado F0/EF0 F1/EF1 F2/EF2 F3/EF3 F4/EF4 F5/EF5



Source: National Oceanic and Atmospheric Administration

The map above shows the strongest tornadoes reported in each county in Texas from 1950-2021. Bowie County reported 54 tornadoes with the strongest being an EF4.

Probability of Future Occurrence

According to the FEMA National Risk Index, Bowie County has a Relatively High risk for tornadoes. Tornadoes are most frequent in the months of April, May and June. While tornadoes can occur at any time during the day or night, they tend to form during the late afternoon and into the evening. Based on a historical trend over the past 10 years, there is a 50% chance that Bowie County will experience a tornado touchdown in a given year. The expected tornado size would range between 25 to 1000 yards wide, with a path from one to several miles long. Most tornadoes are expected to touchdown for relatively short periods of time in a bounce type pattern. The possibility of a tornado touchdown on an annual basis is considered highly likely for the County. Source: Bowie County 2022 HMP

The Arctic is warming twice as fast as the rest of the world. As it warms, climate scientists are increasingly concerned that this can have significant implications for the jet stream, and cold arctic air is being pushed into areas that are not prepared for these conditions. (hsph.harvard.edu)

Vulnerability

Due to the frequency and unpredictable pattern of tornadoes, all of Bowie County is vulnerable to tornado-induced damages. The damage potential is high due to the concentration of populated areas, number of mobile homes, older wood framed homes and manufactured housing units throughout the county. The tornado vulnerability level is rated HIGH for Bowie County.

Impact

Tornadoes pose a significant threat to life and safety in the City of Texarkana. While a tornado is on the ground, all citizens in its path are potentially in danger or injury or death. Infrastructure is also at risk from tornadoes.

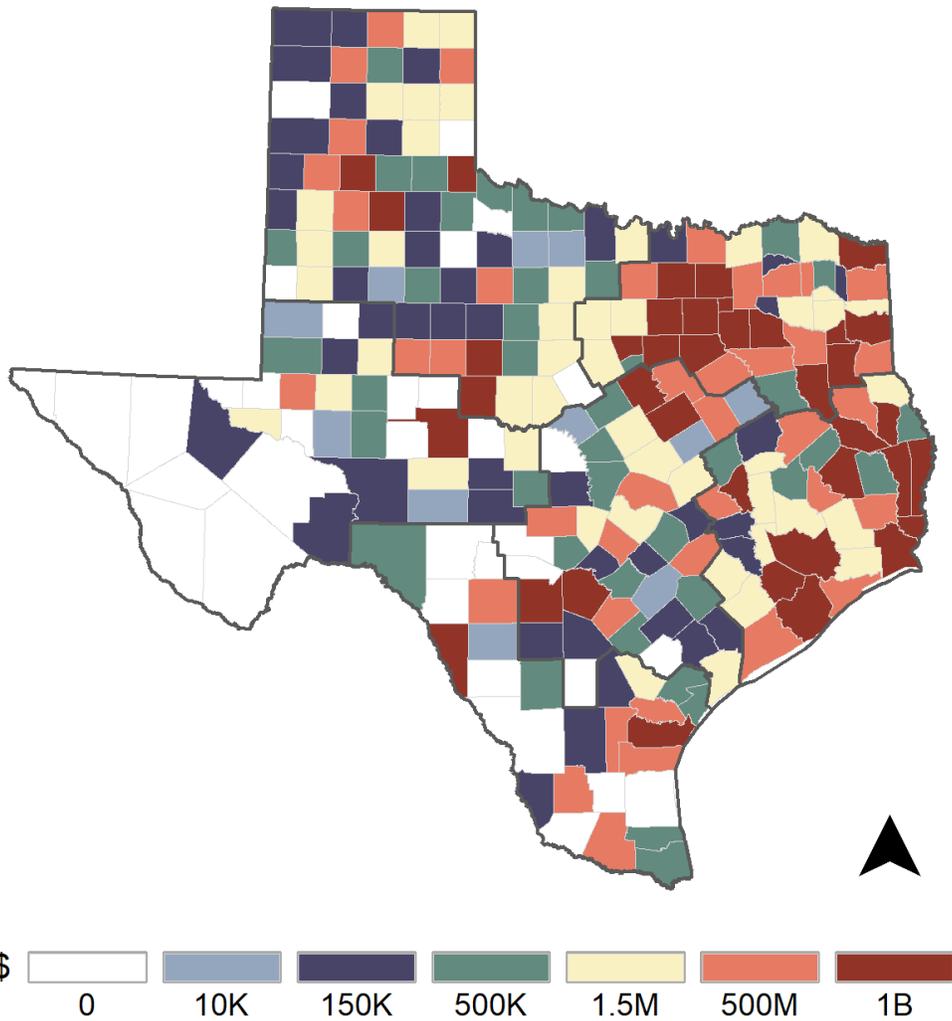
Potential impacts from tornadoes include:

- Injury or death
- Power outage
- Blocked roadways from trees and damaged property
- Natural gas pipeline breaks – fire injuries, possible deaths
- Transportation disruption
- Rerouting traffic
- Loss of property
- Structure and infrastructure damage
- Misplaced residents
- Natural environment damage, to include protected species and critical habitats

The effects of climate change, changes in population and changes in land development are not expected to affect the impact of a tornado event.

TORNADO RISK					
COMMUNITY	POTENTIAL IMPACT 45%	PROBABLITY 30%	Warning 15%	Duration 10%	RISK
City of Texarkana	Substantial PRI=4	Highly Likely PRI=4	< 6 hrs. PRI=4	< 6 hrs. PRI=1	High 3.7

Below is a map from the 2023 SHMP showing Historic Losses from tornados between 2000 to 2021 by county.



Source: National Center for Environmental Information Storm Events Database
<https://ncdc.noaa.gov/stormevents/>

Source: 2023 SHMP

Mitigation Project Ideas:

- Encourage construction of safe rooms
- Build community safe rooms
- Require wind resistant building techniques
- Conduct tornado awareness activities
- Installation and updating outdoor warning sirens
- Enforcing modern building codes
- Installation of generators for emergency power in all critical infrastructure and facilities

Source: FEMA Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards

Wildfire

Description

A wildfire is any outdoor fire that is not controlled, supervised, or arranged. Wildfire probability depends on local weather conditions; outdoor activities such as camping, debris burning, and construction; and the degree of public cooperation with fire prevention measures. Lightning can also cause wildfire events. Drought and extreme heat can also increase the wildfire potential. Wildfires can result in widespread damage to property and loss of life.

Wildfire can be further categorized as wildland, interface, or intermix fires. Wildfire probability depends on local weather conditions, topographic factors, and existing “fuels” such as natural vegetation.

Texas A&M Forest Service (TFS) uses Keetch-Byram Drought Index (KBDI) for determination of drought conditions within the State of Texas. The KBDI is based on a daily water balance, where a drought factor is balanced with precipitation and soil moisture (assumed to have a maximum storage capacity of 8-inches) and is expressed in hundredths of an inch of soil moisture depletion.

The KBDI attempts to measure the amount of precipitation necessary to return the soil to full field capacity. It is a closed system ranging from 0 to 800, where 0 represents a saturated soil, and 800 an absolutely dry soil. At any point along the scale, the KBDI value indicates the amount of precipitation it would take to bring the moisture level back to zero, or saturation.

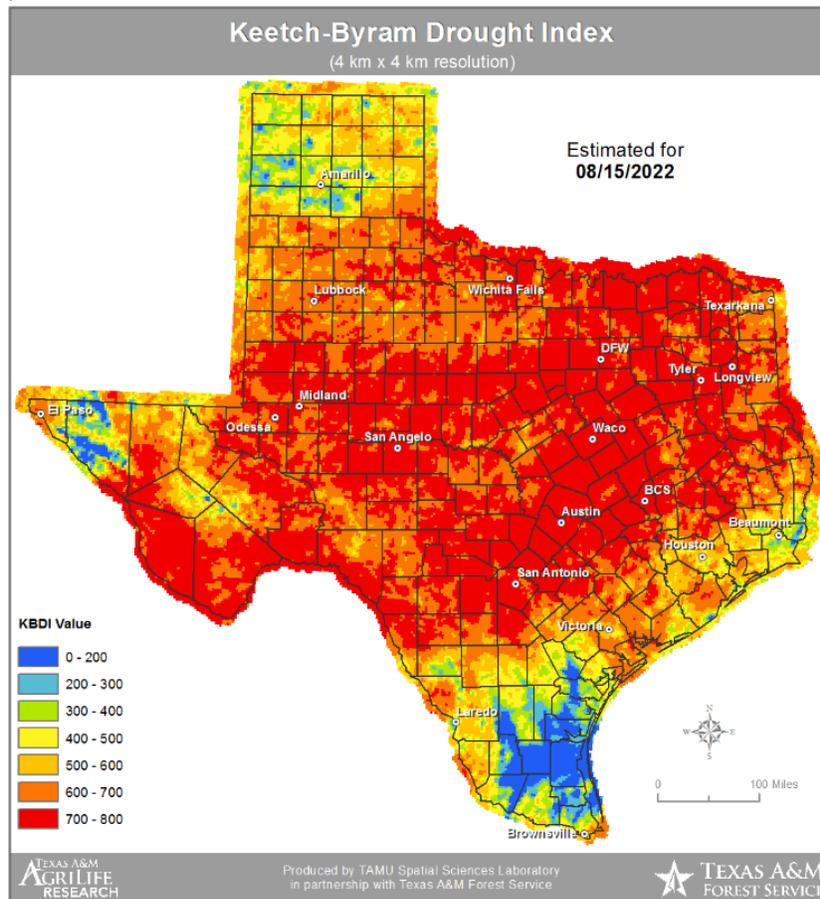
KBDI was developed to correlate the effects of drought on wildfire potential. This relationship is reflected in the KBDI table

KBDI Table

Index Value (inches)	Color Label	Implications
0 – 200	Blue	Soil and fuel moisture are high. Most fuels will not contribute much to wildfire intensity. This is often seen in spring after winter precipitation.
200 – 400	Blue -> Green	Fuels are beginning to dry and contribute to wildfire intensity. Heavier fuels will still not readily ignite and burn. This is often seen in late spring.
400 – 600	Yellow -> Orange	Wildfire intensity begins to increase significantly. Wildfires will readily burn, and larger fuels could burn or smolder for several days. This is often seen in late summer and early fall.
600 – 800	Reds	Wildfires will show extreme intensity. Deep-burning, intense wildfires with significant spotting can be expected. This is often associated with severe drought.

Source: <https://tfsweb.tamu.edu/DroughtStudy/>

Below is an example of the KBDI in Texas:



For the purposes of this hazard analysis, wildfires are assessed under what is known as the wildland-urban interface (WUI). The WUI is geographical area where human development, including structures and other infrastructure, meet or mixes with undeveloped wildlands, making the WUI susceptible to wildfires due to the number of structures located in an area with vegetation that can act as fuel for a wildfire. The WUI creates an environment in which fire can move readily between structural and vegetation fuels. The expansion of these areas has increased the likelihood that wildfires will threaten structures and people.

Similar to the Richter scale for earthquakes, Fire Intensity Scale (FIS) provides a standard to measure potential wildfire intensity. FIS consists of 5 classes where the order of magnitude between classes is tenfold. The minimum class, Class 1, represents very low wildfire intensities and the maximum class, Class 5, represents very high wildfire intensities.

Common practices to minimize the spread of wildfire are fuel breaks and fire breaks. A fuel break is the thinning of vegetation, or fuels, over a specific area of land. They are most commonly used to surround a community and slow the spread of wildfire. By decreasing the amount of vegetation that the fire has to travel through, the risk of extreme fire behavior greatly depreciates.

Types of fuel breaks include:

- **Mechanical Treatments-** A mechanical treatment removes fuels by cutting shrubs, small trees and ladder fuels that make up the understory of a forested area. Materials are either taken from the site or chipped into smaller pieces. Fuels are selected for removal based on how they would contribute to a wildfire. For example, a thick patch of cedar could readily ignite and release significant heat and embers. This fuel type contributes to the rapid spread of wildfire and would need to be removed.

The objective of mechanical treatment is to reduce the intensity of wildfire. If there is less fuel to burn the fire stays low to the ground giving firefighters a safer condition in which to work.

- **Mulching-** A mulching operation is intended to break fuels into smaller pieces and spread them within the fuel break. While the smaller pieces will still carry fire, they will significantly reduce the intensity of it. The goal is to reduce ladder fuels like tall brush that could carry a ground fire into the top of a tree.

Mulching equipment is classified as either traditional mowers or mulchers that grind the material. Heavy duty mowers are useful when fuels are small enough to be pushed over. However, for sites with an established woody mid-story, or ladder fuels, other equipment may be needed.

- **Herbicide Treatment-** Herbicides are used to control invasive species of plants that will “take over” an area. Invasive plant species can also be reduced with mechanical thinning.

The effectiveness of herbicide treatments depends on existing vegetation, topography, and other local restrictions. Thick underbrush may require mechanical treatments prior to the use of herbicides.

- **Grazing-** Removing fuels by grazing relies on the consumption of plants by animals. Various types of livestock are used in this way across the state, including Erath County.
- **Prescribed Burning-** Prescribed or controlled, burning is the most commonly used tool for managing hazardous fuel buildups because of its relatively low cost per acre. Prescribed fire improves natural habitats and reduces heavy fuels. It is important to use a certified and insured prescribed burn manager to improve fire safety and reduce smoke management issues.

Fuel breaks are most effective when placed along a natural fire break like a road. Choosing a site along a road also allows easy access for equipment. Regular maintenance of breaks increases their effectiveness in preventing wildfires. To maintain a fuel break, the use of herbicides as a follow up treatment to mulching will help reduce the amount of weed sprouts. Grazing is also an option to maintain a fuel break.

When creating a fuel break, these tips should be used:

- Follow a natural fire break or contour lines.
- Prune large trees to 10 feet from the ground.
- Remove ladder fuels such as tall brush and small trees.

- Thin trees to create a crown spacing of 25 to 30 feet.
- Break up thick areas of brush.
- Maintain a minimum width of 60 feet on flat land and 100 feet on slopes.

A fire break is a break in vegetation. In some cases, it may be a gravel road, a river, or a clearing made by a bulldozer. A 'green' fire break uses grasses with high moisture content, such as winter rye or winter wheat to provide a break in the continuity of the fuel. If wide enough, a fire break will stop the spread of direct flame. However, embers can still be lofted into the air and travel across the line.

Considering the various types of fuel and fire breaks, the City of Texarkana, Texas has identified wildfires as a threat and has listed wildfire mitigation actions in Section 8, along with actions for all the other identified hazards.

Location

According to the Texarkana Fire Department, the possibility that a wildfire will take place in or around the City cannot be dismissed. Copious amounts of fuel have been deposited on the ground following several winter storms in which ice and snow accumulations toppled many trees and stripped others of branches and foliage. Areas of Texarkana that may be most vulnerable to a wildfire occurrence are the north, west and south boundaries where large tracts of open, wooded and relatively undeveloped lands border the city's limits. The cumulative, potentially endangered population in those areas equals approximately 65% of the Greater Texarkana area's population (Texarkana and suburban communities), in contrast to Texarkana Proper in which the cumulative, potentially endangered population equals approximately 35%. The following areas were identified by the Fire Department as having the highest current vulnerability to wildfire:

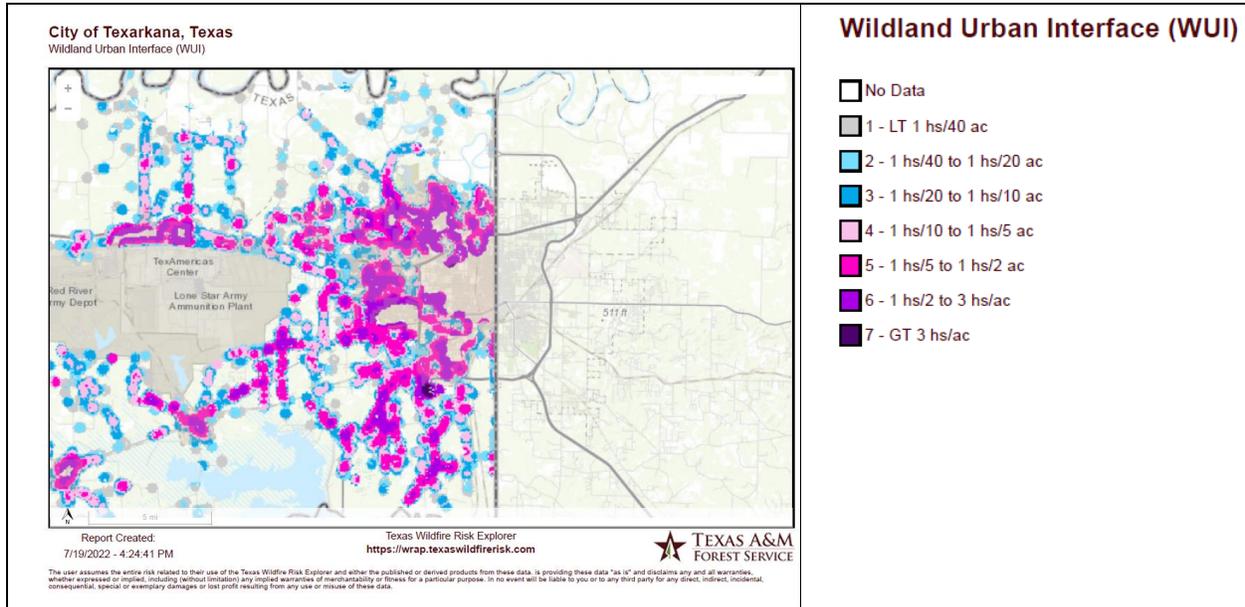
- Area West of North Stateline Avenue. East of railroad tracks. North of Springcreek Road. South of city limits.
- Area North of Shillings Lane. West of Stonecreek. West and South of city limits over to Bringle Lake.
- Area South of Walton Drive. North of New Boston Road. West of Wal-Mart complex to city limit.
- Area South of dead end of Rosewood. North of dead end of Southwestern Street. East of T & P Lake Road. East of Jarvis Parkway.
- Area South of Tyler Street. North of railroad tracks. West of Robison Road. East of dead end of Terry Street.
- Area South of Phillips Lane. North of Jarvis Parkway and Bender Road. West of dead end of Bluebonnet. East of dead end of Kidd lane.

Source: 2011 Texarkana HMP

Extent (Severity)

The frequency and severity of wildfire depends on both weather and human activity. In the planning area, severity has historically been very low, and duration a matter of hours to a day. Continued growth and development throughout the City have increased the threat from wildfire. The KBDI value for the City of Texarkana is 600-700 as of 8/15/22 (see KBDI Map) and is expected to remain in that range in the future.

The Wildland-Urban Interface (WUI) layer of a map reflects housing density depicting where humans and their structures meet or intermix with wildland fuels. Wildfires can cause significant damage to property and threaten the lives of people who are unable to evacuate WUI areas. All improved property, critical facilities, and critical structures and infrastructure located in these wildfire-prone areas are considered vulnerable and can be exposed to this hazard.



Map Source: [texaswildfirerisk.com](https://wrap.texaswildfirerisk.com)

Previous Occurrence

According to the National Centers for Environmental Information (NCEI) storms database, 5 events were reported for Bowie County between 01/01/2011 and 08/31/2022 (4261 days)

WILDFIRE											
Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
BOWIE (ZONE)	BOWIE (ZONE)	TX	08/06/2011	13:00	CST-6	Wildfire		0	0	300.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	08/17/2011	11:00	CST-6	Wildfire		0	2	400.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	09/05/2011	13:00	CST-6	Wildfire		0	0	20.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	09/11/2011	16:10	CST-6	Wildfire		0	0	0.00K	0.00K
BOWIE (ZONE)	BOWIE (ZONE)	TX	10/07/2011	12:00	CST-6	Wildfire		0	0	0.00K	0.00K
Totals:								0	2	720.00K	0.00K

2011, the wildfire year. Drought and unprecedented heat made 2011 the worst year for wildfires in Texas history. From November 15, 2010 through September 29, 2011, Texas saw 23,835 fires that burned more than 3.8 million acres and destroyed 2,763 Texas homes.

BOWIE COUNTY WILDFIRE BY ACREAGE 2013-2022

Source: Texas A & M Forest Service

YEAR	ACREAGE
2013	276
2014	230
2015	826
2016	442
2017	368.5
2018	171.5
2019	255
2020	294.5
2021	171
2022	576.5
TOTAL	3611

Probability of Future Occurrence

According to the FEMA National Risk Index, Bowie County has a Relatively Low Risk for Wildfire. The probability of a wildfire in the City of Texarkana is low, however it is possible. Due to increased human activity in forested areas, incidents can occur more frequently. It is probable that a wildfire of some magnitude will occur each year, although many such fires will be relatively small and quickly expressed.

Source: 2011 Texarkana HMP

Climate conditions continue to grow hotter and drier. If these conditions continue the likelihood of wildfires will worsen. (usgs.gov)

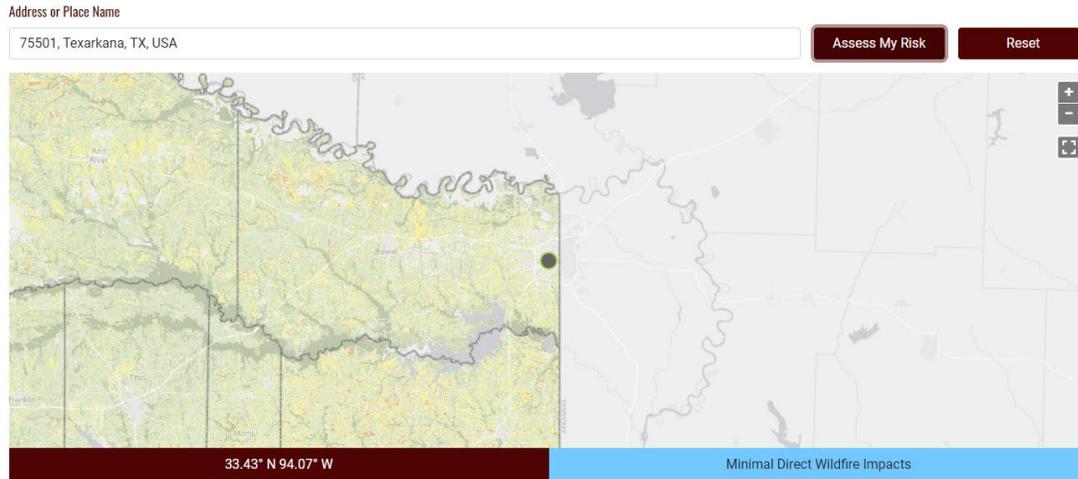
Vulnerability

The most vulnerable month for wildfires is July. Bowie County consists of heavily wooded pine, hard wood, bottom land and pasture. Crops, timber, pasture, and dwellings are in danger of being destroyed by wildfires.

June through August tends to be the high point of wildfire season in most years nationally. The only recent year in which the peak month didn't fall within that window was 2011, when a host of wildfires in Texas caused Governor Rick Perry to declare 252 counties as disaster areas.

According to the Texas A&M Forrest Service Risk Explorer, the City of Texarkana has Minimal Direct Wildfire Impacts, as shown on the Wildfire Risk Map below.

Wildfire Risk Map Texarkana, Texas



Wildfire threat is the likelihood of a wildfire occurring or burning into an area. Threat is derived by combining a number of landscape characteristics including surface and canopy fuels, resultant fire behavior, historical fire occurrence, percentile weather derived from historical weather observations, and terrain conditions. These inputs are combined using analysis techniques based on established fire science.

The measure of wildfire threat used in the Texas Wildfire Risk Assessment (TWRA) is based on the Wildland Fire Susceptibility Index (WFSI). WFSI combines the probability of an acre igniting (Wildfire Ignition Density), and the expected final fire size based on rate of spread in four percentile weather categories. WFSI is defined as the likelihood of an acre burning.



The City of Texarkana, Texas achieved the highest level of protection available as an ISO Class 1 Community, on July 1, 2020

Impact

Potential impacts from wildfires include:

- Injury or death
- Property and fence damage

- Road closure
- Loss of power – burning utility poles
- Loss of property
- Loss of crops and livestock
- Structure and infrastructure damage
- Misplaced residents
- Loss of resources
- Natural environments damage, to include protected species and critical habitats

The effects of climate change, changes in population and changes in land development are not expected to affect the impact of a wildfire event.

WILDFIRE RISK					
COMMUNITY	POTENTIAL IMPACT 45%	PROBABILITY 30%	Warning 15%	Duration 10%	RISK
City of Texarkana	Substantial PRI=4	Highly Likely PRI=4	< 6 hrs. PRI=4	< Week PRI=3	High 3.9

Mitigation Project Ideas

- Map and assess vulnerability to wildfire
- Incorporate wildfire mitigation in the comprehensive plan
- Reduce risk through land use planning
- Develop a wildland-urban interface code
- Require or encourage fire-resistant construction techniques
- Retrofit at-risk structures with ignition-resistant materials
- Create defensible space around structures and infrastructure
- Conduct maintenance to reduce risk
- Implement a fuels management program
- Participate in the Firewise USA program
- Increase wildfire risk awareness
- Educate property owners and wildfire mitigation techniques

Source: FEMA Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards

Climate Change

Once considered an issue for the distant future, climate change has moved firmly into the present. According to the National Climate Change Assessment, evidence of climate change appears in every region and impacts are visible in every state.

U.S. average temperature has increased by 1.3°F to 1.9°F since record keeping began in 1895; most of this increase has occurred since about 1970. The most recent decade was the nation’s warmest on record. Temperatures in the United States are expected to continue to rise.

Certain types of extreme weather events with links to climate change have become more frequent and/or intense, including prolonged periods of heat, shorter and warmer winters, heavy downpours, and, in some regions, floods and droughts. The observed warming and other climatic changes are triggering wide-ranging impacts in every region of our country and throughout our economy.



Source: <https://nca2018.globalchange.gov/chapter/1/>

The Great Plains region, which includes Texas, has its own unique impacts. The region experiences multiple climate and weather hazards, including floods, droughts, severe storms, tornadoes, hurricanes, and winter storms. In much of the Great Plains, too little precipitation falls to replace that needed by humans, plants, and animals. These variable conditions already stress communities and cause billions of dollars in damage. Climate change will add to both stress and costs.

Although projections suggest more frequent and more intense droughts, heavy downpours, and heat waves, people can reduce vulnerabilities through the use of new technologies, community-driven policies, and the judicious use of resources. Efforts to reduce greenhouse gas emissions and adapt to climate change can be locally driven, cost effective, and beneficial for local economies and ecosystem services.

Impact Summary

1. **Communities:** Climate change creates new risks and exacerbates existing vulnerabilities in communities across the United States, presenting growing challenges to human health and safety, quality of life, and the rate of economic growth.

2. **Economy:** Without substantial and sustained global mitigation and regional adaptation efforts, climate change is expected to cause growing losses to American infrastructure and property and impede the rate of economic growth over this century.

3. Interconnected Impacts: Climate change affects the natural, built, and social systems we rely on individually and through their connections to one another. These interconnected systems are increasingly vulnerable to cascading impacts that are often difficult to predict, threatening essential services within and beyond the Nation's borders.

4. Actions to Reduce Risks: Communities, governments, and businesses are working to reduce risks from, and costs associated with climate change by taking action to lower greenhouse gas emissions and implement adaptation strategies. While mitigation and adaptation efforts have expanded substantially in the last four years, they do not yet approach the scale considered necessary to avoid substantial damage to the economy, environment, and human health over the coming decades.

5. Water: The quality and quantity of water available for use by people and ecosystems across the country are being affected by climate change, increasing risks and costs to agriculture, energy production, industry, recreation, and the environment.

6. Health: Impacts from climate change on extreme weather and climate-related events, air quality, and the transmission of disease through insects and pests, food, and water increasingly threaten the health and well-being of the American people, particularly populations that are already vulnerable.

7. Indigenous Peoples: Climate change increasingly threatens Indigenous communities' livelihoods, economies, health, and cultural identities by disrupting interconnected social, physical, and ecological systems.

8. Ecosystems and Ecosystem Services: Ecosystems and the benefits they provide to society are being altered by climate change, and these impacts are projected to continue. Without substantial and sustained reductions in global greenhouse gas emissions, transformative impacts on some ecosystems will occur; some coral reef and sea ice ecosystems are already experiencing such transformational changes.

9. Agriculture: Rising temperatures, extreme heat, drought, wildfire on rangelands, and heavy downpours are expected to increasingly disrupt agricultural productivity in the United States. Expected increases in challenges to livestock health, declines in crop yields and quality, and changes in extreme events in the United States and abroad threaten rural livelihoods, sustainable food security, and price stability.

10. Infrastructure: Our Nation's aging and deteriorating infrastructure is further stressed by increases in heavy precipitation events, coastal flooding, heat, wildfires, and other extreme events, as well as changes to average precipitation and temperature. Without adaptation, climate change will continue to degrade infrastructure performance over the rest of the century, with the potential for cascading impacts that threaten our economy, national security, essential services, and health and well-being.

11. Oceans & Coasts: Coastal communities and the ecosystems that support them are increasingly threatened by the impacts of climate change. Without significant reductions in global greenhouse gas emissions and regional adaptation measures, many coastal regions will be transformed by the latter part of this century, with impacts affecting other regions and sectors. Even in a future with lower greenhouse

gas emissions, many communities are expected to suffer financial impacts as chronic high-tide flooding leads to higher costs and lower property values.

12. Tourism and Recreation: Outdoor recreation, tourist economies, and quality of life are reliant on benefits provided by our natural environment that will be degraded by the impacts of climate change in many ways.

Global climate is projected to continue to change over this century and beyond, but there is still time to act to limit the amount of change and the extent of damaging impacts. It is important that these findings and response options be shared broadly to inform citizens and communities across our nation. Climate change presents a major challenge for society. This report advances our understanding of that challenge and the need for the American people to prepare for and respond to its far-reaching implications.

Climate change affects human health in many ways. For example, increasingly frequent and intense heat events lead to more heat-related illnesses and deaths and, over time, worsen drought and wildfire risks, and intensify air pollution. Increasingly frequent extreme precipitation and associated flooding can lead to injuries and increases in waterborne disease. *Source: globalchange.gov*

Integrating climate risk management into existing design, planning, and operations workflows (or mainstreaming), in contrast to adding novel decision processes for climate adaptation alone, can provide many adaptation benefits. Additional climate risk reduction, particularly under the most severe longer-term climate change projections, emphasizes the need for more and more significant changes to regulatory and policy environments at all scales, to cultural and community resource planning, to economic and financial systems, to technology applications, and to ecosystems.

Section 5: Capability Assessment

Capability Assessment describes the ability of the city to implement strategies and incorporate mitigation principles into other planning initiatives.

Administrative, Financial, Regulatory, Outreach, and Technical Capabilities

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of natural hazards. Administrative and technical capabilities include staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions. Education and outreach programs and methods can be used to implement mitigation activities and communicate hazard-related information.

Local Land Use Planning, City Plans and Ordinances
Comprehensive Plan, Renew Texarkana
Municipal Code (General and Land) Adopted 2015
Flood Damage Prevention Ordinance
Historic Preservation Overlay District
Stormwater Management Plan
Stormwater Ordinance
Subdivision Ordinance
International Fire Code 2018 edition
Zoning Ordinances
Building Codes
Capital Improvements Plan (CIP)
Economic Development Plan and Quarterly Reports
Hazard Mitigation Plan
Historic Ordinance
Local Emergency Operations Plan
Texarkana Regional Active Transportation Plan

Administrative Capabilities and Critical Mitigation Staffing Capabilities
Planning and Zoning Commission
Historic Landmark Commission
Mitigation Planning Committee
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)
Emergency Management Coordinator
Deputy Emergency Management Coordinator
Chief Building Official
Texarkana Brownfields Regional Environmental Coalition
Planning and Community Development Director
Environmental Services Unit
Fire Chief
Floodplain Administrator
GIS Coordinator
Parks and Recreation Director
Public Works Director

Technical Capabilities
CodeRED Emergency Notification System shared by Bowie and Miller Counties
13 Outdoor Warning Sirens, including a voice activated siren at Spring Lake Park
Office of Emergency Management and Fire Department have access to Tier II Reports
Grant Writer
GIS software

Public Education and Outreach
Emergency Preparedness – OEM and the FD work with the local Texarkana Area Community Organizations Active in Disaster (TACOAD) on preparedness plans.
Ongoing Fire Prevention education at health fairs and annually in schools and organizations.
Emergency Preparedness education ongoing on social media and at health fairs.
Certified StormReady on October 10, 2019
Natural disaster or safety related school programs????

Financial Capabilities
General Budgeting
Grant Writing
CDBG Funding
FEMA Mitigation Funding
Other State and Federal Funding

The City of Texarkana, Texas is dedicated to expand and improve on these capabilities as new needs are recognized to reduce risks from natural hazards.

Potential Funding Sources

The resources listed here show funding available to support mitigation projects in addition to funding that may be provided by through City of Texarkana budget appropriations. Local jurisdictions may be able to access federal programs available to states by working in partnership with State entities on program design and implementation. While the City of Texarkana per se may not be eligible for all programs listed, the jurisdiction may participate in a regional partnership whereby it supports the cooperative efforts of other communities to create programs with broad geographic impact.

Federal Government Mitigation Funding Sources

The FEMA Region 6 Texas Mitigation Assistance Resource Guide provides state, territory, and local officials with a wide array of potential mitigation funding resources. These resources include grants, loans, technical assistance, and in-kind services from federal, state, territory, and private sources. Each resource includes information about the program, eligibility requirements, cost sharing, and an example of program use, if available. The Guides also align the resource with the National Mitigation Framework core capability and the National Disaster Recovery Framework support function.

Developing a smart mitigation plan to apply for FEMA’s Hazard Mitigation Grant Program (HMGP) is a best practice for long-term mitigation strategy.

Applications must comply with FEMA guidelines:

- The project must conform to the State Hazard Mitigation Plan,
- Provide a beneficial impact to the area,
- Meet environmental regulations, and
- Solve a problem to be cost effective.

Federal Emergency Management Agency (FEMA) Programs

Program	Details
Flood Mitigation Assistance Program (FMA)	Provides funding to implement measures to reduce or eliminate the long-term risk of flood damage.
Hazard Mitigation Grant Program (HMGP)	Provides grants to implement long-term hazard mitigation measures after a major disaster declaration.
National Flood Insurance Program (NFIP)	Enables property owners to purchase insurance as a protection against flood losses in exchange for state and community floodplain management regulations that reduce future flood damages.
Fire Management Assistance Grants Program (FMAG)	Provides equipment and supplies purchases, overtime labor costs, temporary repairs of damage from firefighting activities, emergency work, evacuations and sheltering, search and rescue, mobilization, and demobilization.
Building Resilient Infrastructure and Communities (BRIC)	Building Resilient Infrastructure and Communities (BRIC) will support states, local communities, tribes, and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards. BRIC is a new FEMA pre-disaster hazard mitigation program that replaces the existing Pre-Disaster Mitigation (PDM) program.
Emergency Management Performance Grant (EMPG)	Helps communities program implement the National Preparedness System by supporting the building, sustainment, and delivery of core capabilities essential to achieving the National Preparedness with an overall goal of securing and creating a resilient nation.

The Combined Use of HMA Programs - Eligible Hazard Mitigation Assistance Activity Examples

Eligible Activities	HMGP	PDM	FMA
1. Mitigation Projects	✓	✓	✓
Property Acquisition and Structure Demolition	✓	✓	✓
Property Acquisition and Structure Relocation	✓	✓	✓
Structure Elevation	✓	✓	✓
Mitigation Reconstruction	✓	✓	✓
Dry Floodproofing of Historic Residential Structures	✓	✓	✓
Dry Floodproofing of Non-residential Structures	✓	✓	✓
Generators	✓	✓	✓
Localized Flood Risk Reduction Projects	✓	✓	✓
Non-localized Flood Risk Reduction Projects	✓	✓	
Structural Retrofitting of Existing Buildings	✓	✓	✓
Non-structural Retrofitting of Existing Buildings and Facilities	✓	✓	✓
Safe Room Construction	✓	✓	
Wind Retrofit for One- and Two-Family Residences	✓	✓	
Infrastructure Retrofit	✓	✓	✓
Soil Stabilization	✓	✓	✓
Wildfire Mitigation	✓	✓	
Post-Disaster Code Enforcement	✓		
Advance Assistance	✓		
5 Percent Initiative Projects	✓		
Miscellaneous/Other ⁽¹⁾	✓	✓	✓
2. Hazard Mitigation Planning	✓	✓	✓
Planning Related Activities	✓		
3. Technical Assistance			✓
4. Management Cost	✓	✓	✓

⁽¹⁾ Miscellaneous/Other indicates that any proposed action will be evaluated on its own merit against program requirements. Eligible projects will be approved provided funding is available.

Environmental Protection Agency (EPA)

Program	Details
Clean Water Act Section 319 Grants	Grants for water source management programs including technical assistance, financial assistance, education, training, technology transfer, demonstration projects, and regulation. Funds are provided only to designated state and tribal agencies
Clean Water State Revolving Funds	State grants to capitalize loan funds. States make loans to communities, individuals, and others for high-priority water-quality activities.
Wetland Program Development Grants	Funds for projects that promote research, investigations, experiments, training, demonstrations, surveys, and studies relating to the causes, effects, extent, prevention, reduction, and elimination of water pollution.
Targeted Watersheds Grants Program	Established in 2003, the Targeted Watersheds Grant program is designed to encourage successful community-based approaches and management techniques to protect and restore the nation's watersheds. Managed by the Environmental Protection Agency.

Floodplain, Wetland and Watershed Protection Programs

Program	Details
USACE Planning Assistance to States (PAS)	Fund plans for the development and conservation of water resources, dam safety, flood damage reduction and floodplain management. 50% non-federal match.
USACE Flood Plain Management Services (FPMS)	Technical support for effective floodplain management.
Texas Silver Jackets	Under the National Flood Risk Management Program, promotes agency collaboration and coordination with interagency, state-led flood risk and multiple hazard management teams. Provides resources/tools to support information sharing and networking, and to promotes flood risk awareness efforts and actions to reduce risk.
USACE Environmental Laboratory	Guidance for implementing environmental programs such as ecosystem restoration and reuse of dredged materials.
U.S. Fish & Wildlife Service Coastal Wetlands Conservation Grant Program	Matching grants to states for acquisition, restoration, management, or enhancement of coastal wetlands.
U.S. Fish & Wildlife Service Partners for Fish and Wildlife Program	Program that provides financial and technical assistance to private landowners interested in restoring degraded wildlife habitat.

Office of Housing and Urban Development (HUD)

Program	Details
Community Development Block Grants (CDBG) - DR	Grants to develop viable communities, principally for low- and moderate-income persons. CDBG funds available through Disaster Recovery Initiative. Disaster funds contingent upon Presidential disaster declaration.
Community Development Block Grants (CDBG) – Mitigation (MIT)	This unique program represents a significant opportunity for eligible grantees – those affected by recent disasters -- to carry out strategic and high-impact activities to mitigate disaster risks and reduce future losses by: increasing resilience to disasters, and reducing or eliminating the long-term risk of loss of life, injury, damage to and loss of property, and suffering and hardship by lessening the impact of future disasters.
Disaster Recovery Assistance	Disaster relief and recovery assistance for individuals in the form of special mortgage financing for rehabilitation of impacted homes.
Neighborhood Stabilization Program	Funding to State and local governments and non-profits for the purchase and rehabilitation of foreclosed and vacant property in order to renew neighborhoods devastated by the economic crisis.

Bureau of Land Management (BLM)

Program	Details
Community Assistance and Protection Program	Focuses on mitigation/prevention, education, and outreach. National Fire Prevention and Education teams are sent to areas across the country at-risk for wildland fire to work with local residents.
Firewise Communities Program	Effort to involve homeowners, community leaders, planners, developers, and others in the effort to protect people, property, and natural resources from the risk of wildland fire before a fire starts.

U.S. Department of Agriculture (USDA)

Program	Details
USDA Forest Service Economic Action Program	Funds for preparation of Fire Safe plans to reduce fire hazards and utilize byproducts of fuels management activities in a value-added fashion. 80% of total cost of project may be covered.
USDA Natural Resources Conservation Service Emergency Watershed Protection Support	Funds for implementing emergency measures in watersheds in order to relieve imminent hazards to life and property created by a natural disaster.
USDA Natural Resources Conservation Service Watershed Protection and Flood Prevention	This program provides for cooperation between the Federal government and the states and their political subdivisions to work together to prevent erosion, floodwater and sediment damage, to further the conservation development, use and disposal of water, and to further the conservation and proper use of land in authorized watersheds.

Health and Economic Agencies

Program	Details
Department of Health & Human Services Disaster Assistance for State Units on Aging (SUAs)	Provide disaster relief funds to those SUAs and tribal organizations who are currently receiving a grant under Title VI of the Older Americans Act. For areas designated a Disaster Declaration issued by the President.
Economic Development Administration (EDA) Economic Development Administration	Grants that support public works, economic adjustment assistance, and planning. Certain funds allocated for locations recently hit by major disasters. The maximum investment rate shall not exceed 50% of the project cost.
U.S. Small Business Administration Small Business Administration Loan Program	Low-interest, fixed rate loans to small businesses for the purpose of implementing mitigation measures. Also available for disaster damaged property. Must meet SBA approved credit rating.

Corporation for National and Community Service (CNCS)

Program	Details
AmeriCorps Senior Corps Social Innovation Fund Volunteer Generation Fund	The nation's largest grant-maker for service and volunteering plays a critical role in strengthening America's nonprofit sector and addressing the nation's challenges through service.

Research Grants

Program	Details
National Science Foundation (NSF) Decision, Risk, and Management Sciences Program (DRMS)	Grants for small-scale, exploratory, high-risk research having a severe urgency with regard to natural or anthropogenic disasters and similar unanticipated events.
U.S. Geological Survey (USGS) National Earthquake Hazards Reduction Program	The purpose of NEHRP is to provide products for earthquake loss reduction to the public and private sectors by carrying out research on earthquake occurrence and effects. Communities with population under 20,000.

Texas Water Development Board

Program	Details
FEMA Flood Mitigation Assistance Program (FMA)	As described under federal programs, the State manages grants to subgrantees for planning or project assistance to communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the National Flood Insurance Program.
Flood Protection Planning Program	Planning assistance to communities in evaluation of structural and nonstructural solutions to flooding problems, including flood early warning systems and flood response plans.
Drinking Water State Revolving Fund	Below-market, fixed interest rate loans. Principal forgiveness for qualifying disadvantaged, green, very small systems, and urgent need projects.
Rural Water Assistance Fund	Long-term, fixed interest rate loans that provide small, rural water utilities with low-cost, long-term financing for the planning, design acquisition, and construction of water and wastewater projects.
State Participation Program – Regional Water and Wastewater Facilities	Long-term, fixed interest rate financing through temporary TWDB ownership interest in a regional facility.
State Water Implementation Fund for Texas (SWIFT)	Flexible financing options: low-interest loans, deferred loans, or temporary TWDB ownership interest.
Economically Distressed Areas Program	Provides financial assistance for the planning, design, acquisition, and construction of water and wastewater projects in economically distressed areas where service is unavailable or is inadequate to meet state standards.
Agricultural Water Conservation Grants	Funding for conservation projects or programs.
Agricultural Water Conservation Loans	Funding for conservation projects or conservation programs as outlined in Agricultural Water Conservation Grants above.
Groundwater Conservation District Loan Program	Finance the startup costs (salaries and payroll taxes, utilities, travel, insurance, building and office leases, office supplies and furniture, telephone and computer equipment, and legal and professional fees) of groundwater conservation districts.
Regional Water Planning Group Grants Program	Planning activities for the long-term (50-year) water supply needs of Texas.
Regional Facility Planning Grant Program	Studies to evaluate and recommend the most feasible alternatives to meet regional (two or more participating entities or service areas) water supply and wastewater facility needs, estimate the costs associated with implementing the recommendations, and identify any institutional arrangements that may be necessary to provide regional water supply and wastewater services.
Water Research Grant Program	Water research that addresses one of the Texas Water Development Board's designated research topics published in its most recent request for proposals.

Texas General Land Office (GLO)

Program	Details
Natural Resources Damage Assessment (NRDA)	Natural resource trustees are the designated federal, state and tribal agencies who are responsible for the natural resources impacted by an oil spill or hazardous substance release. In-state agencies that work together on these efforts include: <ul style="list-style-type: none"> • The General Land Office: • Texas Commission on Environmental Quality: • Texas Parks and Wildlife Department (TPWD)

Texas Department of Agriculture

Program	Details
CDBG Program	TDA administers the Community Development Block Grant for Rural Texas. The primary objective of the CDBG is to develop viable communities by providing decent housing and suitable living environments and expanding economic opportunities principally for persons of low- to moderate- income.
Agricultural Management Assistance (AMA)	Program provides financial and technical assistance to agricultural producers to voluntarily address issues such as water management, water quality, and erosion control by incorporating conservation methods into their farming operations.
Agricultural Water Enhancement Program (AWEP)	The Agricultural Water Enhancement Program is a voluntary conservation initiative that provides financial and technical assistance to agricultural producers to implement water enhancement activities on agricultural land to conserve surface and ground water and improve water quality.
Conservation Innovation Grants (CIG)	Voluntary program intended to stimulate the development and adoption of innovative conservation approaches and technologies while leveraging federal investment in environmental enhancement and protection, in conjunction with agricultural production.
Environmental Quality Incentives Program (EQIP)	Voluntary program that provides financial and technical assistance to agricultural producers through contracts up to a maximum term of ten years.
Wildlife Habitat Incentive Program (WHIP)	Voluntary program for conservation-minded landowners who want to develop and improve wildlife habitat on agricultural land, nonindustrial private forest land, and tribal land.

Texas Department of Housing and Community Affairs

Program	Details
HOME Program	The program goal is to expand in rural areas the supply of decent, safe, affordable housing and strengthen public-private housing partnerships between units of general local governments, public housing authorities, nonprofits, and for-profit entities. Funding has been set aside funding for Disaster Relief and Persons with Disabilities, among others.

Texas Commission on Environmental Quality (TCEQ)

Program	Details
Nonpoint Source Grant Program	The TCEQ and the Texas State Soil and Water Conservation Board (TSSWCB) administer federal grants for activities that prevent or reduce nonpoint source pollution. Grants are awarded annually and fund projects for up to three years. The TCEQ usually solicits grants in the summer of each year. Opportunities and instructions for how to apply are published on the web site below. The grants are made available through a federal program authorized under §319 of the Clean Water Act (CWA).
American Recovery and Reinvestment Act (ARRA)	State-managed program utilizing federal funding, ARRA provided significant funding for states to finance high priority water infrastructure projects through a \$2 billion appropriation to the DWSRF (see below) program and a \$4 billion appropriation to the CWSRF (see below) program. EPA's CWSRF & DWSRF ARRA Implementation webpage provides information on the status of ARRA implementation as well as guidance and resources for states and other stakeholders.
Clean Water State Revolving Fund	Provides attractive, low-cost funding for projects that improve water quality, renew wastewater infrastructure, and support local economies. The independent, revolving loan funds all 50 states and Puerto Rico to administer the SRF program, providing financial assistance to local communities.
Drinking Water State Revolving Fund (DWSRF)	The Safe Drinking Water Act, through the DWSRF, makes funds available to drinking water systems to finance infrastructure improvements. The program also emphasizes providing funds to small and disadvantaged communities and to programs that encourage pollution prevention as a tool for ensuring safe drinking water.

Section 6: Mitigation Goals and Strategy

Mitigation Strategy includes the goals and objectives developed to provide a strong foundation for implementing hazard mitigation strategies. Individual Actions were identified by goal and objective and include a mitigation group and priority. An implementation process is also defined including how priorities were established. Funding Sources and Hazard Mitigation Assistance eligibility criteria are included.

Framework for Mitigation

Mitigation actions may occur before or after a disaster event. This plan describes the risk assessments used to develop the goals that are consistent with the hazards, vulnerabilities and consequences identified in the City's risk assessment. The result is increased community resilience.

Timely and effective hazard mitigation has multiple benefits including:

- Minimizing deaths and injuries
- Reducing losses to property, facilities, and infrastructure
- Minimizing the negative impact on the environment and the negative effect on the economic condition of the city which impacts the state and the nation
- Lessening the workload of emergency responders
- Assuring continuity of government operations and service delivery
- Creating conditions where recovery occurs more quickly and is less costly
- Improving the public's confidence in local government

Hazard Mitigation Goals

The overarching mitigation goals focus on the City's efforts to reduce loss of life, destruction of property, and disruption of our community. Team members agreed that the primary mission is to reduce and eliminate the long-term risk of loss of life and property damage from the negative effects of natural, technological, and human-caused hazards through hazard mitigation.

Goal: Efficiently use City resources to minimize the loss of life and property from natural hazards and protect County assets, infrastructure, and critical facilities.

The City's hazard mitigation objectives include:

1. Saving and protecting lives and reducing or preventing damage to public and private property from natural, technological, and human-caused hazard events.
2. Protect public health, safety, and welfare by increasing public awareness of existing natural hazards and by fostering individual and public responsibility in mitigating risks caused by those hazards.
3. Encourage building and land use regulations that increase safety and resiliency and reduce risks posed by natural disasters.
4. Empower citizens and businesses to make risk-informed decisions through public education and outreach activities.
5. Improve coordination between departments, local businesses, stakeholders, and agencies by understanding the impact of hazards in the City and developing policies and strategies to effectively manage risk.
6. Support the goals and objectives of the State Hazard Mitigation Plan and FEMA.
7. Ensure that infrastructure is adequate and properly maintained to provide continued functionality of all critical services necessary to protect residents and property.

Hazard Mitigation Strategies

The mitigation strategy serves as the long-term blueprint for reducing the potential losses identified in the risk assessment. The Stafford Act directs hazard mitigation plans to describe hazard mitigation actions and establish a strategy to implement those actions. Therefore, all other requirements for a hazard mitigation plan lead to and support the mitigation strategy.

The strategies below (designed to reduce the risk and vulnerabilities associated with specific hazards) cover one or more hazard mitigation actions. The following is an outline of the categories:

Prevention and Policy

Prevention and Policy actions are intended to prevent the risk associated with a particular hazard or hazards from getting worse and to ensure that future community development does not increase hazard losses. Communities can achieve significant progress toward hazard resistance through preventative actions. This is particularly true in areas that have not been developed.

Prevention and Policy actions include:

- Planning and zoning such as floodplain regulations, dam breach inundation zones
- Open space preservation of parks and recreation areas
- Land development regulations such as large lot sizes
- Stormwater management to clear ditches and enlarge retention basins
- Capital improvement planning so that no infrastructure extends into hazard areas
- Building codes
- Post-disaster code compliance

Property Protection and Life-Safety

Property Protection and Life-Safety actions are used to modify buildings and/or their surroundings to reduce their vulnerability and risk associated with a particular hazard or hazards. While hazards such as floods, tornadoes, wildfires, or hurricanes may not be avoidable, these actions directly protect people and property. Because protecting a building does not have to affect the building's appearance, hazard mitigation projects are popular in historic and cultural sectors.

Property protection and life-safety actions include:

- Localized and regional drainage improvement projects
- Acquisition (public procurement and management of lands vulnerable to damage from hazards)
- Relocation (permanent evacuation of hazard-prone areas through movement of existing development and population to safer areas)
- Elevation of structures above the base flood elevation events)
- Flood-proofing and localized flood control
- Installation of residential or community safe-rooms or shelters
- Creating defensible spaces around structures in and around Wildland-Urban Interface areas
- Nonstructural seismic retrofits (strapping water heaters to walls, reinforcing connections for suspended ceilings and wall, bookcases and electronics mounted on walls)
- Community warning systems
- Barriers on roadways at low water crossings to prevent motorists from driving through moving water

Mitigation Planning and Public Education/Awareness

Mitigation Planning and Public Education/Awareness efforts inform and instruct people regarding hazards associated with developed areas and the actions that need to be taken to avoid potential damage and injury.

Planning and public education/awareness actions include:

- Development and maintenance of local Hazard Mitigation Plans
- Hazard maps and other hazard information
- Risk and vulnerability analysis
- Public education campaigns with website and social media materials
- Outreach programs to provide hazard and mitigation information
- Coordination with businesses to provide hazard mitigation information to employees and customers
- Notices to residents and property owners in a specific hazard-prone area
- Informational displays in widely used facilities, such as public buildings and malls
- Print media, radio/TV spots, and interviews
- Presentations at neighborhood meetings
- Real estate disclosure requirements
- Information in public libraries or a library developed specifically for hazard mitigation
- Flood gauges and flood monitoring systems

Critical Facilities Protection

Critical Facilities Protection actions safeguard the community's ability to respond and recover from a hazard event. These actions have a major effect on the scope of damage.

Critical facilities protection actions include:

- Emergency back-up generators for essential facilities (police and fire stations, hospitals, jails, utilities and water, wastewater treatment facilities, data centers)
- Structural retrofits to improve the survivability and continued operations of critical facilities
- Safe-rooms or storm shelters at facilities that house emergency services personnel or populations requiring special services (nursing homes, prisons, schools, colleges/universities)
- Protection measures for facilities that can create secondary hazards (nuclear power plants, hazardous materials production, storage facilities)
- Protection measures to ensure the survivability and continued operation of the utility systems

Structural Projects

Structural Projects are built to control hazards and directly protect people and property at risk.

Structural project actions include:

- Structural retrofits (dams, reservoirs, dikes, levees that do not meet state standards)
- Revetments (retaining walls or sandbag barricades)
- High-flow diversions to reduce floodwater volume
- Debris basins to capture sediment and vegetation washed out during storms
- Channel modifications

Protection of the Environment, Natural Resources, Cultural and Historic Sites

Natural Resource Protection reduces the intensity of hazard effects to improve the quality of the environment and wildlife habitats. Parks, recreation, and conservation agencies and organizations often implement these activities. These actions often present excellent opportunities for non-traditional partnerships to achieve complementary objectives.

Natural resource protection actions include:

- Establish/Develop/Implement Water Smart Program
- Develop/Implement tree management planning and mitigation measures
- Erosion and sediment control
- Wetlands restoration, preservation, and protection
- Reforestation
- Stream corridor restoration
- Watershed management
- Forest and vegetation management

HMA Grant eligible activities: Aquifer Storage and Recovery, Floodplain and Stream Restoration, Flood Diversion and Storage, and Green Infrastructure Methods. While focused on addressing the long-term impacts of flooding and drought, these activities can mitigate any natural hazard.

Mitigation Approach

In developing and ranking the 2022-2023 mitigation actions, the City applied the ranking criteria recommendations outlined in the FEMA Local Mitigation Planning Handbook (March 2013). Each criterion is shown below.

Mitigation Ranking Criteria

Criteria	Description
Life Safety	How effective will the action be at protecting lives and preventing injuries?
Property Protection	How significant will the action be at eliminating or reducing damage to structures and infrastructure?
Technical	Is the mitigation action technically feasible? Is it a long-term solution? Eliminate actions that, from a technical standpoint, will not meet the goals.
Political	Is there overall public support for the mitigation action? Is there the political will to support it?
Legal	Does the community have the authority to implement the action?
Environmental	What are the potential environmental impacts of the action? Will it comply with environmental regulations?
Social	Will the proposed action adversely affect one segment of the population? Will the action disrupt established neighborhoods, break up voting districts, or cause the relocation of lower income people?
Administrative	Does the community have the personnel and administrative capabilities to implement the action and maintain it or will outside help be necessary?
Local Champion	Is there a strong advocate for the action or project among local departments and agencies that will support the action’s implementation?
Other Community Objectives	Does the action advance other community objectives, such as capital improvements, economic development, environmental quality, or open space preservation? Does it support the policies of the comprehensive plan?

Source: FEMA Local Hazard Mitigation Planning Guide

Current Proposed Mitigation Action Items

As part of the economic evaluation of mitigation action, participants analyzed actions in terms of the overall costs, measuring whether the potential benefit to be gained from the action outweighed all costs associated with it. As a result of this exercise, priority was assigned to each mitigation action by marking them as High, Medium (Med), or Low. For example, an action that is ranked as “High” indicates that the action will be implemented as soon as feasible, when and if funding and resources are available. A “Medium” action may not be implemented depending on the cost and number of citizens served by the action and/or other opportunities available. Actions ranked as “Low” will not be implemented until “High” and “Medium” actions have been considered for funding, unless an opportunity presents itself to be favorable to implement faster rather than later, or a future disaster occurs that moves the ranking of the action to a higher priority.

Actions presented in this section represent a comprehensive range of mitigation actions per current state and FEMA Guidelines, including at least one action per hazard, and includes actions that address both future development and construction as well as present infrastructure.

The Planning Committee agrees to include actions that may also benefit preparedness, response, and overall enhance the community’s resiliency. The cost/benefit of each hazard mitigation action was considered as part of the actions identification process to ensure a risk reduction benefit. All actions are considered optional and to be used as a guide for consideration, and the city or community is not bound to the completion of the actions. The actions are beneficial proposals to reduce risk, and to be implemented on a case-by-case basis and in consideration of funding, resources, and existing ability.

Prioritization of actions are performed with a holistic view, broad input, and criteria consideration recommendations listed in the FEMA Local Mitigation Planning Handbook. Additionally, hazards impacting the planning area in a more impactful manner, which increases the consequences, causes a disaster, or otherwise increases risk, may cause a change in action priority over time. Priority ranking will be categorized as Low, Med (Med), or High, in the mitigation action tables.

Many of the previous goals and actions were never acted on and some of the old actions are no longer valid. This updated plan represents the most current data available regarding actions needed to reduce loss of life and property through mitigation. The five-year update is seen as an opportunity to set actions in place that are current, valid, and obtainable. No natural event has occurred since the original plan that would alter the current plan’s prioritization. There have been no new developments in the city that would alter vulnerability. The City of Texarkana has experienced less than 1% variation in population since 2010. There have been no changes politically or financially that would impact the plan’s development.

Funding Priorities

As necessary, the City of Texarkana will seek outside funding sources to implement mitigation projects in both the pre-disaster and post-disaster environments. When applicable, potential funding sources have been identified for proposed actions listed in the mitigation strategies. Priority will go towards projects will the highest positive impact on community resilience.

Status of Previous Mitigation Action Items

High Priority Mitigation Action Items from 2011-2012 HMP

City of Texarkana		
2012 Mitigation Action Review	Disposition	Explanation
Replace or rebuild existing concrete channels from Rio Grande to College.	On-going	Included in Drainage CIP
Install storm drain system, Robin Road and Honeysuckle Street. Establish positive drainage along Robin Road; detain water upstream of Arroyo, and add storm drain system.	On-going	Included in Drainage CIP
Channel improvements, Pecan Creek. Install earthen walls or a concrete channel to handle runoff from surrounding developments.	On-going	Included in Drainage CIP
Reconstruct vertical wall channel in Ferguson Park to resolve structural issues resulting from erosion, and to improve conveyance.	On-going	Included in Drainage CIP
Increase carrying capacity of natural and roadside drainage ditches in Cooper Lane/McKnight/Skylark area.	Complete	Delete in New Plan
Install depth gauges and radio-controlled guard arms at three flood-prone underpasses and warning lights and "Do Not Enter" sign at flood-prone residential intersection. City wishes to upgrade these sites to include automatic barrier arms linked to gauges, if funding is available through grants.	Remove	Delete in New Plan
Purchase back-up generators for New Boston Booster Station and Lake Wright Patman and Millwood Filter plants.	Partially Complete	Continue in New Plan
Obtain Swift-Water Rescue training for fire and police department responders.	On-going	Continue in New Plan
Purchase of back-up generator for City Hall so that, in the event of emergency, governmental functions may continue uninterrupted.	Complete	Delete in New Plan
Installation of NOAA radios in schools, public buildings, group homes, nursing homes and where special needs populations reside.	Complete	Delete in New Plan
Begin public education initiative to help residents understand the dangers associated with attempting drive through floodwaters.	Remove	Delete in New Plan
As part of the City's ongoing efforts to ensure the safety of all its citizens, Texarkana will (a) continue with strong enforcement of local building codes, which ensure that all new construction is of sufficient quality to resist damage from most natural hazards that are likely to affect the region, and (b) continue stringent enforcement of all local floodplain regulations, in accordance with federal (primarily the NFIP) requirements. All new infrastructure will continue to be designed and constructed in accordance with standard engineering practices in order to ensure that these elements are able to resist the effects of natural hazards, and that they perform adequately.	On-going	Continue in New Plan
Purchase and Install Generator at Fleet Services Facility and at new EOC/OEM location.	Complete	Delete in New Plan
The City will continue its long-term commitment to enforcing the various requirements of the NFIP and will continue to encourage citizens and property owners who may be at risk of flooding to purchase flood insurance. The City is still considering participation in the Community Rating System.	On-going	Continue in New Plan
Development of a PC-based alert service that would operate from a central location and immediately notify residents of any type of relevant emergency situation (severe weather, child abduction, chemical spill).	Complete	Delete in New Plan

City of Texarkana		
2012 Mitigation Action Review	Disposition	Explanation
Purchase brush truck and ‘mules’, equipped with tanks, for forward firefighting.	Complete	Delete in New Plan
Establish a food and supplies bank in a central location, or locations where special needs populations reside, so that necessities would be readily accessible to responders and residents without the means to go in search of them.	Complete	Delete in New Plan
Initiate a hazard awareness program in local schools and encourage students to involve their parents in disaster education and preparation.	Complete	Delete in New Plan
Partial buy-out of Harriet Hubbard Heights Subdivision and replacement with low-impact recreational area for use by general public. Priority: Original HMP – High; for 2011 update priority has changed to Low, as project is put in suspense pending additional mapping and risk information that will likely indicate that the area is no longer at any significant flood risk.	Remove	Delete in New Plan
Initiative to encourage emergency responders to become more familiar with locations of special needs populations (poor, elderly, Spanish-speaking) and to develop relationships with leaders/representatives of those communities.	On-going	Continue in New Plan
Begin a public education initiative to help residents understand the dangers of extreme heat, the symptoms of heat exhaustion and heat stroke and how to respond/treat. Deleted from 2011 HMP update.	Remove	Delete in New Plan
Take advantage of wildland firefighting training opportunities.	On-going	Continue in New Plan
Review and modify the City’s building code to increase the emphasis on fire-resistant materials and construction techniques.	On-going	Continue in New Plan
Pass ordinances to ensure clear passage across private property for Fire Department and other emergency vehicles during wildfire events.	Remove	Delete in New Plan
Develop and initiate a program to identify areas in the City that require brush and fuel clearance and clear these areas on a prioritized basis.	Remove	Delete in New Plan
Begin initiative to educate the public on proper use of power generators.		
Improve the City’s level of coordination with State and federal agencies with regard to drought prediction and response activities. Specifically, develop an ongoing relationship with the State of Texas Drought Preparedness Council, and assign a staff member from the City to continuously monitor NOAA and the Drought Preparedness Council situation reports. In addition to these activities, over time the City will assess and modify its drought response protocols as needed.	On-going	Continue in New Plan
Develop a detailed City drought response and management plan.	Complete	Delete in New Plan
Develop and circulate to citizens and businesses information about water conservation measures, such as installing low-flow plumbing systems and limiting non-essential water consuming activities during periods of drought	On-going	Continue in New Plan
Develop and pass a City-wide ordinance to allow authorities to closely restrict water usage when specific drought severity criteria are met. The criteria will be developed as part of the process of writing the ordinance.	Remove	Delete in New Plan

City of Texarkana		
2012 Mitigation Action Review	Disposition	Explanation
Continue to improve coordination with the Texas Council on Environmental Quality regarding dam inspections.	On-going	Continue in New Plan
Update and revise the Emergency Action Plans for both dams in the City. In addition to this action, develop a mailer that will be sent to citizens and property owners downstream of the two dams, to inform them of the availability of the EAPs, and providing a point of contact at the City for questions and concerns about dam safety and response.	Complete	Delete in New Plan
Engage with citizens and the Police and Fire Departments to identify specific areas and sensitive populations that would likely be at risk during a dam failure event and develop a system whereby the populations would be warned and evacuated in a timely manner. This will involve outreach and development of a network of individuals in affected areas who could be relied upon to carry out notification and evacuation procedures in addition to those undertaken by the City.	On-going	Continue in New Plan
Install dam failure warning systems immediately downstream of the two dams that can affect Texarkana.	Remove	Delete in New Plan
Complete seismic retrofits on a prioritized basis, starting with the most vulnerable elements in the most critical facilities, as determined in the study noted in Item 6 above. The City anticipates that the work will begin with non-structural retrofits such as securing unanchored elements such as bookshelves, lights, televisions, etc. In some cases, there will likely be the need for other and more significant retrofits, such as improving connections between buildings and non-structural elements such as parapet walls and exterior features such as chimneys. The exact nature of this work will not be known until the study is completed.	Remove	Delete in New Plan
Initiate a study of a set of facilities in the City that may be at risk from a seismic event. The City will prioritize the facilities to be included in such a study based on their criticality, occupancy, and structural characteristics. The study includes initial development of information about unreinforced structures City-wide, including residential and commercial uses.	Remove	Delete in New Plan
Initiate a study of one or more of the highest-hazard dams in the City, if inspections or other information reveals that the risk profiles have changed. The study will identify the inundation limits and potential depth and location of flooding, i.e. the extent of the hazard.	Complete	Delete in New Plan

Source: Taken from 2012 City HMP

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Additional Mitigation Actions in 2012 Texarkana HMP

Status	ATCOG
Continue in new plan	(1) Harden the 2,200 sf. of EOC space to FEMA 361 guidelines by installing roof-to-wall mechanical connectors, improving the roof framing to resist falling debris, installing three layers of 3/4" exterior plywood on the walls that surround the EOC, eliminating one window and replacing two doors with impact-resistant units.
Partially complete, EOC does have own HVAC system	(2) Separate the HVAC systems for the EOC and install them in another part of the building.
Continue in new plan	(3) Install a hardened space around the generator.
Continue in new plan	(4) Re-locate power and telephone feed to the building underground and re-locate both telephone and electrical distribution systems to interior walls.
Continue in new plan	(5) Remove the gazebo.
Continue in new plan	(6) Analyze the communications tower to determine if the tower needs to be reinforced to survive a significant wind event.
	WADLEY REGIONAL MEDICAL CENTER
Complete, remove from plan	(1) Harden the 19,800 sf. (6,600 sf. per floor x 3) of IT, telephone and elevator penthouse space by installing a wind-borne missile barrier behind the glazing. This barrier could be 6" reinforced masonry or heavy gage metal sheets installed on a steel frame in the interior of the space. There is approximately 3,000 sf. of glazing in these areas. Allow \$50/sf.
Continue in new plan	(2) Secure the roof top equipment to the roof. Allow for 50 pieces of equipment @ \$250/each.
Continue in new plan	(3) Install a hardened space around the generator and fuel oil tank.
Continue in new plan	(4) Replace existing tar and gravel roofs with modified bitumen cap sheet. Allow \$5s.f. for 20,000 sf.
Complete, remove from plan	(5) Analyze the communications tower to determine if the tower needs to be reinforced to survive a significant wind event.
	TEXARKANA REGIONAL AIRPORT
Continue in new plan	(1) Harden 500 s.f. of space (for 50 people) to FEMA 361 guidelines by installing an interior roof and walls that would resist wind-borne missiles and high wind pressures assuming the existing space fails in both the terminal and the fire and rescue buildings.
Continue in new plan	(2) Install a hardened space around the generators.
Continue in new plan	(3) Install a new lightning rod at the fuel storage area.
	CHRISTUS ST. MICHAEL HEALTH SYSTEM
Continue in new plan	(1) Harden the generator switchgear space by installing a wind-borne missile barrier behind the glazing. This barrier could be 6" reinforced masonry or heavy gage metal sheets installed on a steel frame in the interior of the space. There is approximately 1,500 sf. of soft gypsum board behind the brick veneer in these areas. Allow \$100/sf. including temporary electrical panel relocation.
Continue in new plan	(2) Secure the roof top equipment to the roof. Allow for 50 pieces of equipment @ \$250/each.
Continue in new plan	(3) Install lightning cable clips to the roof surface or to other fixed surfaces. Allow \$50/clip and 50 clips
Continue in new plan	(4) Replace existing tar and gravel roofs with modified bitumen cap sheet.
Continue in new plan	(5) Analyze the communications tower to determine if the tower needs to be reinforced to survive a significant wind event.
	TEXARKANA WATER UTILITIES
Continue in new plan	(1) Build hardened storage for the chlorine storage at New Boston Rd. plant and the Wright Patman Reservoir. This hardened storage could be 6" reinforced masonry. Assume each building would need 50 sf. for each cylinder stored. There is approximately 1,800 sf. of hardened space at these two locations. Allow \$200/sf. for this hardened space.
Continue in new plan	(2) Harden 5,000 sf. of the interior of the existing 1988 building at the South Regional plant. Allow \$150/sf. for this hardened space.

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Complete, remove from plan	(3) Harden the spaces that house IT infrastructure including windows only at the New Boston Rd. plant. Allow \$150/sf. for 1,200 sf.
Continue in new plan	(4) Build hardened storage for the chlorine storage at New Boston Rd. plant and the Wright Patman Reservoir. This hardened storage could be 6" reinforced masonry. Assume each building would need 50 sf. for each cylinder stored. There is approximately 1,800 sf. of hardened space at these two locations. Allow \$200/sf. for this hardened space.
Continue in new plan	(5) Analyze the two communications towers to determine if the towers need to be reinforced to survive a significant wind event.
	BI-STATE JUSTICE BUILDING
Continue in new plan	(1) Harden the 1,000 sf. of dispatch and communications space by installing a wind-borne missile barrier behind the glazing. This barrier could be 6" reinforced masonry or heavy gage metal sheets installed on a steel frame in the interior of the space. There is approximately 150 sf. of glazing in these areas. Allow \$75/sf.
Continue in new plan	(2) Secure the roof top equipment to the roof. Allow for 40 pieces of equipment @ \$250/each.
Continue in new plan	(3) Analyze the communications tower to determine if the tower needs to be reinforced to survive a significant wind event.
Continue in new plan	(4) Harden the 1,000 sf. of dispatch and communications space by installing a wind-borne missile barrier behind the glazing. This barrier could be 6" reinforced masonry or heavy gage metal sheets installed on a steel frame in the interior of the space. There is approximately 150 sf. of glazing in these areas. Allow \$75/sf.
Continue in new plan	(5) Secure the roof top equipment to the roof. Allow for 40 pieces of equipment @ \$250/each.

Comprehensive Range of Specific Mitigation Actions Tables

The comprehensive range of specific mitigation actions and projects are listed below. A cost benefit review was performed to help decide which action items are feasible. The cost estimate and funding source are listed below. A cost benefit analysis will be performed prior to submission of any application to FEMA. Priorities listed below are defined as:

- High 1-3 Years
- Medium 4-7 Years
- Low 8+ Years.

Estimated Cost of Actions	
Low	0-\$10,000
Medium	\$10,000-\$25,000
High	\$25,000 +

NOTE: All of the City of Texarkana, Texas projects are subject to availability of federal and local funding as well as availability of local staff to administer the project. Priority will go towards projects with the highest positive impact on community resilience, including life safety and property protection.

Hazard(s) Addressed	Flood
Action: Complete drainage projects on the Drainage Capital Improvement Project List. (See Appendix for complete list and estimated cost)	
Mitigation Goal/Objective	Goal #1 Protect Life and Property
Priority	High
Potential Funding Source(s)	City of Texarkana, FEMA, Grants
Estimated Cost	High (\$25K +)
Lead Agency/Department Responsible	Director of Public Works
Estimated Completion Time	1-3 years
Effect on New Buildings	This could help reduce the extent of erosion.
Effect on Existing Buildings	This could help reduce the extent of erosion.

Hazard(s) Addressed	Flood
Action: Purchase back-up generators for New Boston Booster Station and Lake Wright Patman Filter plant.	
Mitigation Goal/Objective	Goal #1: Protect Life and Property
Priority	High
Potential Funding Source(s)	City of Texarkana, FEMA, Grants
Estimated Cost	High (\$25K +)
Lead Agency/Department Responsible	Director of Public Works
Estimated Completion Time	1-3 years
Effect on New Buildings	This could help reduce the extent of erosion.
Effect on Existing Buildings	This could help reduce the extent of erosion.

Hazard(s) Addressed	Flood
Action: Channel improvements, Pecan Creek. Install earthen walls or a concrete channel to handle runoff from surrounding developments.	
Mitigation Goal/Objective	Goal #1: Protect Life and Property
Priority	High
Potential Funding Source(s)	City of Texarkana, FEMA, Grants
Estimated Cost	High (\$25K +)
Lead Agency/Department Responsible	Director of Public Works
Estimated Completion Time	1-3 years
Effect on New Buildings	This could help reduce the extent of erosion.
Effect on Existing Buildings	This could help reduce the extent of erosion.

Hazard(s) Addressed	Flood, Thunderstorm Wind, Hail
Action: Continue with strong enforcement of local building codes, which ensure that all new construction is of sufficient quality to resist damage from most natural hazards that are likely to affect the region, and continue stringent enforcement of all local floodplain regulations, in accordance with federal (primarily the NFIP) requirements.	
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #4: Partnership and Implementation
Priority	High
Potential Funding Source(s)	City of Texarkana
Estimated Cost	Low (0-\$10K)
Lead Agency/Department Responsible	Director of Inspections and Code Enforcement
Estimated Completion Time	1-3 years
Effect on New Buildings	This could minimize damage from natural hazards.
Effect on Existing Buildings	This could minimize damage from natural hazards.

Hazard(s) Addressed	Flood
Action: Obtain Swift-Water Rescue training for fire and police department responders.	
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #5: Emergency Services
Priority	High
Potential Funding Source(s)	City of Texarkana, FEMA, Grants
Estimated Cost	Medium (\$10-25K)
Lead Agency/Department Responsible	Emergency Management Coordinator
Estimated Completion Time	1-3 years
Effect on New Buildings	N/A
Effect on Existing Buildings	N/A

Hazard(s) Addressed	Flood
Action: Continue enforcing the various requirements of the NFIP and continue to encourage citizens and property owners who may be at risk of flooding to purchase flood insurance. Consider participation in the Community Rating System.	
Mitigation Goal/Objective	Goal #2: Public Awareness Goal #4: Partnership and Implementation
Priority	High
Potential Funding Source(s)	City of Texarkana
Estimated Cost	Low (0-\$10K)
Lead Agency/Department Responsible	Emergency Management Coordinator
Estimated Completion Time	1-3 years
Effect on New Buildings	Flood insurance helps property owners recover faster.
Effect on Existing Buildings	Flood insurance helps property owners recover faster.

Hazard(s) Addressed	Winter Storm, Drought, Wildfire, Hail
Action: Create an education program in local schools that focus on how to mitigate from natural hazards such as winter storm, drought, wildfire and hail.	
Mitigation Goal/Objective	Goal #2: Public Awareness
Priority	High
Potential Funding Source(s)	City of Texarkana
Estimated Cost	Low (0-\$10K)
Lead Agency/Department Responsible	Office of Emergency Management
Estimated Completion Time	1-3 years
Effect on New Buildings	N/A
Effect on Existing Buildings	N/A

Hazard(s) Addressed	Drought
Action: Develop an ongoing relationship with the State of Texas Drought Preparedness Council and assign a staff member from the City to continuously monitor NOAA and the Drought Preparedness Council situation reports. In addition to these activities, over time the City will assess and modify its drought response protocols as needed.	
Mitigation Goal/Objective	Goal #4: Partnership and Implementation
Priority	Low
Potential Funding Source(s)	City of Texarkana
Estimated Cost	Low (0-\$10K)
Lead Agency/Department Responsible	Emergency Management Coordinator
Estimated Completion Time	8+ years
Effect on New Buildings	N/A
Effect on Existing Buildings	N/A

Hazard(s) Addressed	Drought
Action: Develop and circulate to citizens and businesses information about water conservation measures, such as installing low-flow plumbing systems and limiting non-essential water consuming activities during periods of drought.	
Mitigation Goal/Objective	Goal #2: Public Awareness
Priority	Low
Potential Funding Source(s)	City of Texarkana
Estimated Cost	Low (0-\$10K)
Lead Agency/Department Responsible	Director of Public Works
Estimated Completion Time	8+ years
Effect on New Buildings	Installing low-flow plumbing systems saves water, energy and money.
Effect on Existing Buildings	Updating plumbing systems saves water, energy and money.

Hazard(s) Addressed	Wildfire
Action: Take advantage of wildland firefighting training opportunities.	
Mitigation Goal/Objective	Goal #5: Emergency Services
Priority	Low
Potential Funding Source(s)	City of Texarkana, FEMA
Estimated Cost	Low (0-\$10K)
Lead Agency/Department Responsible	Fire Chief, Texarkana, Texas Fire Department
Estimated Completion Time	8+ years
Effect on New Buildings	N/A
Effect on Existing Buildings	N/A

Hazard(s) Addressed	Wildfire
Action: Review and modify the City's building code to increase the emphasis on fire-resistant materials and construction techniques.	
Mitigation Goal/Objective	Goal #1: Protect Life and Property
Priority	Low
Potential Funding Source(s)	City of Texarkana
Estimated Cost	Low (0-\$10K)
Lead Agency/Department Responsible	Chief Building Official
Estimated Completion Time	8+ years
Effect on New Buildings	Could prevent the spread of fire within the building.
Effect on Existing Buildings	Could prevent the spread of fire within the building.

Hazard(s) Addressed	Dam Failure
Action: Initiative to encourage emergency responders to become more familiar with locations of special needs populations (poor, elderly, Spanish-speaking) and to develop relationships with leaders/representatives of those communities.	
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #4: Partnership and Implementation
Priority	Medium
Potential Funding Source(s)	City of Texarkana, FEMA, Grants
Estimated Cost	Low (0-\$10K)
Lead Agency/Department Responsible	Emergency Management Coordinator
Estimated Completion Time	4-7 years
Effect on New Buildings	N/A
Effect on Existing Buildings	N/A

Hazard(s) Addressed	Dam Failure
Action: Continue to improve coordination with the Texas Council on Environmental Quality regarding dam inspections.	
Mitigation Goal/Objective	Goal #4: Partnership and Implementation
Priority	Low
Potential Funding Source(s)	City of Texarkana
Estimated Cost	Low (0-\$10K)
Lead Agency/Department Responsible	Emergency Management Coordinator
Estimated Completion Time	8 + years
Effect on New Buildings	N/A
Effect on Existing Buildings	N/A

Hazard(s) Addressed	Dam Failure
Action: Engage with citizens and the Police and Fire Departments to identify specific areas and sensitive populations that would likely be at risk during a dam failure event, and develop a system whereby the populations would be warned and evacuated in a timely manner.	
Mitigation Goal/Objective	Goal #1: Protect Life and Property Goal #2: Public Awareness
Priority	Low
Potential Funding Source(s)	City of Texarkana
Estimated Cost	Low (0-\$10K)
Lead Agency/Department Responsible	Emergency Management Coordinator
Estimated Completion Time	8 + years
Effect on New Buildings	N/A
Effect on Existing Buildings	N/A

Hazard(s) Addressed	Extreme Cold
Action: Purchase generators for all critical infrastructures. Designate existing structures as warming stations.	
Mitigation Goal/Objective	To protect citizens and property.
Priority	High
Potential Funding Source(s)	City of Texarkana, FEMA, Grants
Estimated Cost	Medium-High (10k-100k)
Lead Agency/Department Responsible	Emergency Management Coordinator
Estimated Completion Time	1-3 years
Effect on New Buildings	N/A
Effect on Existing Buildings	Maintain operability

Hazard(s) Addressed	Extreme Heat
Action: Purchase generators for all critical infrastructures. Designate existing structures as cooling stations.	
Mitigation Goal/Objective	To protect citizens and property.
Priority	High
Potential Funding Source(s)	City of Texarkana, FEMA, Grants
Estimated Cost	Medium-High (10k-100k)
Lead Agency/Department Responsible	Emergency Management Coordinator
Estimated Completion Time	1-3 years
Effect on New Buildings	None
Effect on Existing Buildings	Maintain operability

Hazard(s) Addressed	Infectious Disease
Action: Educate the public through social media, city website, outreach programs, and the city PIO. Have all information in bilingual form.	
Mitigation Goal/Objective	Limit the spread of disease.
Priority	Low
Potential Funding Source(s)	City of Texarkana, Grants
Estimated Cost	1k-10k
Lead Agency/Department Responsible	Supervisor, Texarkana-Bowie County Family Health Center
Estimated Completion Time	8+years
Effect on New Buildings	None
Effect on Existing Buildings	None

Hazard(s) Addressed	Lightning
Action: Install lightning detectors at local parks and playgrounds. Install lightning rods at TWU data sites.	
Mitigation Goal/Objective	Life safety and facility preservation.
Priority	High
Potential Funding Source(s)	City of Texarkana, FEMA, Grants
Estimated Cost	Low (0-\$10K)
Lead Agency/Department Responsible	Emergency Management Coordinator
Estimated Completion Time	1-3 years
Effect on New Buildings	Could protect from direct lightning strike.
Effect on Existing Buildings	Could protect from direct lightning strike.

Hazard(s) Addressed	Tornado
Action: Install storm shelters at key locations. Educate the public to participate in the Texas Residential Safe Room Program. Install additional tornado sirens.	
Mitigation Goal/Objective	Life safety
Priority	Medium
Potential Funding Source(s)	City of Texarkana, FEMA, Grants
Estimated Cost	High (\$25K +)
Lead Agency/Department Responsible	Emergency Management Coordinator
Estimated Completion Time	3-5 years
Effect on New Buildings	N/A
Effect on Existing Buildings	N/A

Hazard(s) Addressed	Thunderstorm Wind
Action: Pass new building codes or city ordinance requiring impact resistant windows or shutters.	
Mitigation Goal/Objective	Goal #2: Public Awareness
Priority	High
Potential Funding Source(s)	City of Texarkana
Estimated Cost	Low (0-\$10K)
Lead Agency/Department Responsible	Office of Emergency Management
Estimated Completion Time	1-3 years
Effect on New Buildings	N/A
Effect on Existing Buildings	N/A

Section 7: Plan Implementation and Maintenance

The City of Texarkana, Texas will implement the Plan and continue to evaluate at least annually, and enhance it over time, as appropriate. Continual public involvement is also addressed. The sustained hazard mitigation planning process consists of three main parts:

- Incorporation into existing planning mechanisms
- Monitoring, Evaluating and Updating the Plan
- Continued public involvement

HMP Incorporation into Other Planning Mechanisms

The City will be responsible for further development and implementation of mitigation actions. Each action has been assigned to a specific department within the City. While the hazard mitigation team members have not yet incorporated the hazard mitigation strategies into other plans and codes, they plan to do so during this next update period. The following describes the process by which the City will incorporate relevant information of the Hazard Mitigation Plan into other planning mechanisms such as the Comprehensive Plan, Capital Improvement Plan, Flood Protection Plan. The City will also review the HMP for risks to ensure that they are considered in the other plans in which natural hazard risk is a consideration. Once the Plan is adopted, the City will consider implementation of actions based on priority and the availability of funding and resources. The City already implements policies and programs to reduce loss to life and property from hazards and many actions on an ongoing basis. The mitigation actions developed for this Plan build upon that effort and will be implemented through other program mechanisms where possible.

The potential funding sources listed for each identified action may be used when the jurisdiction begins to seek funds to implement actions. An implementation time period has been assigned to each action as a gauge for the time required to complete each project, start to finish.

Plan integration is a way to ensure consistency and harmony between the hazard mitigation plan and other local planning mechanisms. It helps identify conflicts and inconsistencies among codes and other ordinances. It provides leveraging opportunities for one planning goal or project to fulfill multiple requirements so that resources are maximized, and duplication of efforts is avoided.

Our goal is to reduce risks through coordinated, community-wide planning.

Texarkana will integrate implementation of their mitigation actions with other plans and policies such as construction standards, building codes, and emergency preparedness plans and ensure that these actions, or proposed projects, are reflected in other planning efforts as applicable. Coordinating and integrating components of other plans and policies into goals and objectives of the HMP will also help leverage funding opportunities and potential cost-sharing of key projects. Upon formal adoption of the Plan, the City's Emergency Management Coordinator or their designee will help responsible plan managers to integrate hazard mitigation strategies and pertinent information into existing plans. As list (not all

inclusive) is provided below of planning mechanisms that can benefit from the Hazard Mitigation information and strategies.

Planning Mechanism	Incorporation of Plan
Grants Applications	The Plan will be consulted by Planning Team Members whenever grant funding is sought for mitigation projects. If a project that has not been previously identified, is not in the Plan, an adjustment can be made as necessary to include the action in the Plan.
Annual Budget Review	Various departments and key personnel that participated in the planning process will review the Plan and mitigation actions therein when conducting their annual budget review. Allowances will be made in accordance with grant applications sought or mitigation actions that will be undertaken according to the implementation schedule of the specific action.
Regulatory Plans	The HMP has been and will continue to be consulted when City departments review or revise their current regulatory planning mechanisms, or in the development of regulatory plans that are not currently in place.
Capital Improvement Plan	Texarkana has a Capital Improvement Plan (CIP) in place. Prior to any revisions to the CIP, City departments will review the risk assessment and mitigation strategy sections of the HMP, as limiting public spending in hazardous zones is one of the most effective long- term mitigation actions available to local governments.
Comprehensive Plan	Texarkana has a Comprehensive Plan in place. Since comprehensive plans involve developing a unified vision for a community, the mitigation vision and goals of the Plan will be reviewed in the development or revision of a Comprehensive Plan.

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Type of Plan	Responsible Department	Review Timeline	New or Existing	Actions to be Integrated	Approval
Comprehensive Plan	Planning & Community Development	Every 5 years	Existing	Identify and implement hardening measures for critical infrastructure.	Comprehensive Plan Steering Committee
Capital Improvement Plan	Planning Department	Every 5 years	Existing	Continue to strengthen at- risk critical facilities.	City Council
Building Codes	Development Services	Every 3 years	Existing	Utilize the Hazard Mitigation Plan when assessing building codes and potential hazards.	City Council
Historic Ordinance	Historic Preservation Office	Annual review	Existing	Implement security and protective measures to historic landmarks.	Historic Preservation Advisory Board
Subdivision Regulations	Development Services	Annual review	Existing	Engage subdivisions in public education activities about disaster preparedness and mitigation strategies.	City Council
Fire Prevention Code	Fire Department	Every 3 years	Existing	Use the Hazard Mitigation Plan as a resource when updating the code.	City Council
Storm Water Management Ordinance	Development Services	Annual review	Existing	Continue to implement long- term mitigation efforts to limit flooding and drainage issues as new development increases.	City Council
Zoning Ordinance	Development Services	Annual review	Existing	Continue to ensure proper zoning to mitigate flooding and other hazards as development in the City increases.	City Council
Community Development Block Grant	Housing & Community Development	Annual review	Existing	Address hazards in McKinney when discussing housing and economic opportunities.	Community Grants Advisory Commission
Urban Areas Security Initiative	Office of Emergency Management	Annual review	Existing	Use the Hazard Mitigation Plan to develop projects to mitigate against terrorism.	Regional Urban Area Working Group

Monitoring, Evaluating, and Updating the Plan

Periodic revisions of the Plan are required to ensure that the goals, objectives, and mitigation action plans are kept current. More important, revisions may be necessary to ensure that the Plan is in full compliance with federal regulations and state statutes. This portion outlines the procedures for completing such revisions and future updates for the City.

Monitoring

The City of Texarkana will oversee the monitoring and evaluation process, although designated Hazard Mitigation Plan Team Members and action managers, will be responsible for monitoring the status of components of the hazard mitigation plan related to their department or agency. The Emergency Management Coordinator or designee will organize an annual meeting to discuss the progress made on implementation of the mitigation actions, discuss challenges to action implementation, and review overall progress of plan implementation.

Plan Monitoring and Implementation

Responsible Personnel	Activity	Update Schedule
Local Planning Team Point of Contact	Monitoring Plan: track implementation and action items, changes to risk assessment, changes to Local Planning Team (LPT), changes to capabilities, and plan integrations.	Twice a year
	Evaluate Plan: assess effectiveness by evaluating completed actions, implementation processes, responsible personnel, and lessons learned.	Annually
	Communicate regularly with the Texarkana, Texas City Council about the results of the HMP implementation.	Annually
	Update Plan	Once every five years

Evaluating

Each year, Planning Team Members will meet to evaluate the hazard mitigation plan and projects status. As part of the evaluation process, they will assess any changes in risk, determine whether implementation of mitigation actions is on schedule, or if there are any implementation problems (such as technical, political, legal or coordination issues), and reflect changes in development and capabilities. The development of land or construction programs that affect the risk and mitigation priorities will also be considered during plan updates and evaluation. This process will help determine if any plan updates are necessary. Additionally, post disaster reviews may help in ensuring that risks are reviewed and updated and that the actions are receiving proper prioritization.

Certification of Annual Meetings

The City of Texarkana, Texas Hazard Mitigation Planning Team (HMPT) has reviewed this Hazard Mitigation Plan (HMP). The Director of the City of Texarkana Office of Emergency Management hereby certifies this review.

YEAR	DATE	PUBLIC OUTREACH ADDRESSED	SIGNATURE
2024			
2025			
2026			
2027			
2028			

Updating

The Disaster Mitigation Act of 2000 requires that the City of Texarkana Hazard Mitigation Plan be updated at least once every five years. During this process, all chapters of the plan will be updated with current information, and analyses and new and/or modified mitigation actions will be developed. The revised plan will be submitted for state and federal review and approval and presented for approval to the City Council. The City of Texarkana, Texas Emergency Management Coordinator or their designee will be responsible for ensuring that this requirement is met. The City of Texarkana Hazard Mitigation Planning Team will review the HMP annually for needed updates. The HMPT will be involved in this process to ensure all departments and private sector partners provide input into the planning process. The public will be invited to participate in this process through public input surveys and public meetings.

Plan Amendments

At any time, minor technical changes may be made to the Plan to keep it updated. However, any material changes to the mitigation actions or major changes in the overall direction of the Plan or the policies contained within it will be subject to formal adoption by the governing body.

At the end of the comment period, the proposed amendment and any comments will be forwarded to the governing body of the City of Texarkana. Planning Team Members will then review the proposed amendment and comments received and vote to accept, reject, or amend the proposed change. Upon ratification, the amendment will be transmitted to TDEM.

In determining whether to recommend approval or denial of a plan amendment request, the following factors will be considered:

- Errors or omissions made in the identification of issues or needs during the Plan preparation.
- New issues or needs that were not adequately addressed in the Plan; and
- Changes in information, data, or assumptions from those on which the Plan was based.

Five Year Review

The Plan will be thoroughly reviewed by the Planning Team every five years to determine whether there have been significant changes in the planning area necessitating changes in the types of mitigation actions proposed. The plan will also be reviewed after each occurrence of major hazard incidents, particularly those triggering a federally disaster declaration for the community.

As with the development of this Plan, the Emergency Management Coordinator or their designee for the City of Texarkana will oversee the review process. At the beginning of each fiscal year, Team Members will meet once to evaluate the Plan. In addition, participants will also meet twice a year, by conference call or presentation, to discuss the implementation of the mitigation actions. New developments in identified hazard areas, an increased exposure to hazards, disaster declarations, the increase or decrease in capability to address hazards, and changes to federal or state legislation are examples of factors that may affect the content of the Plan.

Plan reviews will provide an opportunity to evaluate those actions that have been implemented successfully, and to document potential losses avoided due to the implementation of specific mitigation measures. The plan review also provides the opportunity to review the relevant risk for actions that have not been implemented or assigned and re-access if they can be more feasibly implemented.

Following the five-year review, any revisions deemed necessary will be summarized and utilized according to the reporting procedures and plan amendment process outlined herein. Upon completion of the review and update/amendment process, the revised plan will be submitted to TDEM for final review and approval in coordination with FEMA.

Continued Public Involvement

Input from the public was an integral part of the preparation of this Plan and will continue to be essential throughout the monitoring and evaluation process. Changes or suggestions to this Plan will provide opportunities for community input to include neighborhood association forums, special events, and other engagement opportunities.

Once this plan is formally adopted, it will be available on the City of Texarkana website, where officials and the public are invited to provide ongoing feedback. Copies of the Plan also will be kept for public review at the Texarkana Public Library.

Ongoing mitigation efforts will also be shared with the public through notices posted on its many communications vehicles. These include the City's Facebook page, twitter feed, and print and electronic media. Additional efforts will be made towards multilingual communications. The City will also utilize local media to notify the public of any maintenance or periodic review activities taking place.

Conclusion

Through the development of this plan, the City of Texarkana has developed a thorough hazard history, an inventory of critical facilities, and an updated contact list for emergency contacts at critical facilities. This data, when used in conjunction with the updated information about hazard threats and vulnerabilities, will prove to be invaluable to the City of Texarkana and its citizens.

Natural and technological hazards have been identified citywide. Possible mitigation projects that would reduce the risk to lives and property due to the identified threats have been compiled and prioritized.

The creation of the City of Texarkana Hazard Mitigation Steering Committee has brought together stakeholders from the government and community organizations into one planning team. This group has been able to work together effectively and efficiently to produce this document and establish a greater awareness of our risks and our mitigation strategies.

This plan will continue to evolve as necessary to properly represent the threats and vulnerabilities affecting the City of Texarkana. Continued public participation is encouraged and will be continued through the ongoing hazard mitigation process.

RESOLUTION NO. 2025 019

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF TEXARKANA, TEXAS, ADOPTING THE HAZARD MITIGATION ACTION PLAN / FIVE YEAR UPDATE IN ACCORDANCE WITH FEMA REQUIREMENTS; AND ESTABLISHING AN EFFECTIVE DATE.

WHEREAS, the City of Texarkana, Texas, recognizes the threat that natural hazards pose to people and property within the community, and is committed to the safety and well-being of its residents, businesses, and visitors; and

WHEREAS, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

WHEREAS, the Federal Emergency Management Agency (FEMA) requires that communities develop and adopt a hazard mitigation plan as a condition of eligibility for certain federal disaster assistance and hazard mitigation funding; and

WHEREAS, the Hazard Mitigation Action Plan / Five Year Update [ATTH 01] was developed by the City's Hazard Mitigation Planning Team under the direction and guidance of the City's Office of Emergency Management and Ark-Tex Council of Governments, working in conjunction with the Texas Division of Emergency Management (TDEM), to identify potential hazards, assess risks, and propose mitigation strategies; and

WHEREAS, the Hazard Mitigation Action Plan / Five Year Update has been reviewed and approved by TDEM and FEMA Region 6, pending formal adoption by the City; and

WHEREAS, the City Council finds and determines that adoption of this plan demonstrates the City's commitment to increasing community resilience and to reducing the risks posed by natural hazards.

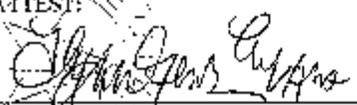
NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF TEXARKANA, TEXAS:

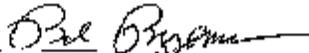
SECTION 1: The Hazard Mitigation Action Plan / Five Year Update ("the Plan") [ATTH 01] is hereby adopted by the City Council as an official plan of the City of Texarkana, Texas.

SECTION 2: The City Manager or designee is authorized to take any actions necessary to implement, administer, and update the Plan as required by FEMA guidelines, including authorization to appoint a Hazard Mitigation Coordinator to coordinate for the City all aspects of the Plan, including its review and maintenance, in accordance with this Resolution.

SECTION 3: This Resolution shall be in full force and effect from and after its passage and approval.

PASSED AND APPROVED in Regular Council Session on this the 10th day of February, 2025.

ATTEST:

JENNIFER EVANS, CITY SECRETARY


BOB BRUGGEMAN, MAYOR

6:25 p.m.

Appendix

Stakeholder Letter

Judge John Doe,

The City of Texarkana, Texas, Office of Emergency Management and Ark-Tex Council of Governments, are preparing a Hazard Mitigation Plan Five-Year Update for the City of Texarkana, Texas. Your county or organization has been identified as a possible stakeholder in the plan and we invite you to participate in our plan development. Hazard Mitigation is defined as any sustained action taken to reduce or eliminate the long-term risk to life and property from hazard events.

Emergency management coordinators, county judges, non-profit organizations, law enforcement, local civil servants, nonprofit groups, and other interested parties are invited to participate. To review a *draft* of the plan, go to <https://texarkanatexas.gov/CivicAlerts.aspx?AID=367>. We will be happy to consider your interests, questions, concerns, suggestions, and participation in the development of this plan. You may contact me by phone or by e-mail at your convenience.

To find out more about hazard mitigation click on or paste the following link:
[fema_local-mitigation-planning-fact-sheet_2023.pdf](#)

If you need additional information, feel free to contact my office.

Kathy McCollum
Hazard Mitigation/Environmental Specialist



4808 Elizabeth Street
Texarkana, TX 75503
903-255-3576
kmccollum@atcog.org

Texarkana Gazette
101 East Broad St.
Texarkana, AR 71854
870-330-7550

COUNTY OF BOWIE
STATE OF TEXAS

I, Brent Hopkins, do solemnly swear that I am the Legal Clerk of the Texarkana Gazette, a newspaper published in Bowie County, Texas and having bona fide circulation therein; that said newspaper is authorized by law to publish legal advertisements; and that the advertisement annexed hereto was published in said newspaper on the following dates:

March 20, 2024
March 24, 2024


Brent Hopkins
Legal Clerk

Subscribed and sworn to before me, this 24th day of March, 2024.


Notary Public
Bowie County, Texas

My Commission expires: 6-27-25



PUBLIC NOTICE
Draft Proposal of the Five-Year
Update of the City of
Texarkana, Texas
Hazard Mitigation Plan

A draft copy of the City of Texarkana, Texas Hazard Mitigation Plan Five-Year Update is posted on the City of Texarkana, Texas Website. The Plan DRAFT has been posted to allow the citizens and stakeholders of the county to review and comment prior to official plan approval. The posted draft is designed to give viewers an idea of what the completed, approved plan will look like. Contact information is posted with plan draft.

Hazard Mitigation is defined as any sustained action taken to reduce or eliminate the long-term risk to life and property from hazard events. It is an on-going process that occurs before, during, and after disasters and serves to break the cycle of damage and repair in hazardous areas.

Drainage Capital Improvement Project List	
<i>Project Name/Description</i>	<i>Cost</i>
Bel-Air Drainage Project Construct 1,500 l f. earthen channel from Ames Dale to Skyline	\$747,915.12
Wadley - City Triggs Drainage Project Reconstruct existing concrete channel from 10th/Wood to 11th/Walnut	\$2,528,800.78
Potomac Drainage Project (Glenwood Addition) Reconstruct existing concrete channel from Potomac Ave to Sabine	\$1,972,928.16
Cowhorn Creek Improvements Reconstruct existing concrete channel along Beverly Park	\$2,128,997.53
Cherry Hills Drainage Project Construct vertical wall channel from TISD to Nichols	\$1,308,803.16
Pecan Cove Drainage Project Extend earthen channel to Clear Creek Drive	\$554,543.32
Palisades Addition Drainage Project Reconstruct road crossing and improve channel to King's Highway (6' curbed channel)	\$496,214.17
19th and Wood Drainage Project (Highland Park) Reconstruct existing concrete channel and buyout property at 19th/wood	\$2,036,117.96
Forest Brook Drainage Project Channel Improvements and detention pond	\$848,124.84
Pecan Creek - Stonewall Drainage Project Pecan Creek - Stonewall Drainage Project	\$616,705.21
Pleasant Hills Drainage Project Construct Underground storm drain from 5808 Turtle Creek to Chapparal lane	\$973,821.70
Richmond Pines - Holly and Honeysuckle Drainage Project Channel Improvements (15' wide curbed conc. Channel) and Detention Pond	\$1,135,027.09
Rochelle Addition Drainage Project Reconstruct channel and improve drainage from Ferguson Park to Detention Pond on 36th - Refer to Study by Half and Assoc	\$9,756,410.00
Cowhorn Creek East Trib. Drainage Project Reconstruct channel from Moores to North Park and construct detention pond north of Moores - Refer to MTG study	\$665,202.80
Sleepy Hollow Drainage Project Reconstruct ditches and driveways and 900 l f 6' curbed channel behind houses on s. side of Sleep Hollow	\$670,202.80
*Wagner Creek Clearing Project 1 Clear obstructions along Wagner Creek from Lake Drive to 7th St. (assume 40' clear path on both sides of creek).	\$577,500.00
*Wagner Creek Clearing Project 2 Clear obstructions along Wagner Creek from south of I30 to I369. (assume 40' clear path on both sides of creek). Cost should Split with Nash, Tx.	\$565,400.00
*Wagner Creek Clearing Project 3 Clear obstructions along Wagner Creek from south of I30 to City Limits. (assume 40' clear path on both sides of creek).	\$389,950.00
*Cowhorn Creek Clearing Project Clear obstructions along Cowhorn Creek from Wagner Creek to W. 15th St. (assume 40' clear path on both sides of creek).	\$311,300.00
*Howard Creek Clearing Project Clear obstructions along Howard Creek from Buchanan Road to I369. (assume 40' clear path on both sides of creek).	\$789,250.00
*Clear Creek Clearing Project Clear obstructions along Clear Creek from University Ave. to Skyline Blvd. (assume 40' clear path on both sides of creek).	\$335,500.00
*Will need property owners' permission.	
TOTAL	\$29,408,714.62

References

Texas State Hazard Mitigation Plan addresses risks, mitigation capabilities, strategies, and actions on a state level. There are a few areas of the State Hazard Mitigation Plan that suggest possible actions on the part of both the state and City of Texarkana, Texas that would help to align their mitigation goals and strategies and would foster cooperation between the groups to advance mitigation efforts.

Special thanks to Alayna Payne for the guidance and best plan examples.

Beyond the Basics – Best practices in Local Mitigation Planning: www.mitigationguide.org

NOAA National Centers for Environmental Information: <https://statesummaries.ncics.org/chapter/tx/>

Climate Adaption Knowledge Exchange: <https://www.cakex.org/resources/region/southwest-7081>

National Climate Change Assessment: <https://nca2014.globalchange.gov/>

Dam Safety:

<https://damsafety.org/media/faq#What%20is%20the%20hazard%20potential%20classification%20system%20for%20dams?%20What%20does%20it%20mean%20for%20a%20dam%20to%20be%20high%20hazard?>

United States Census My Community Explorer

<https://experience.arcgis.com/experience/13a111e06ad242fba0fb62f25199c7dd/page/Page-1/>

Hazus Loss Library

<https://hazards.fema.gov/hll/library>

NOAA Climate Monitoring: <https://www.ncdc.noaa.gov/climate-monitoring/>

Drought.gov: <https://www.drought.gov/county/data>

CDC/ATSDR Social Vulnerability Index: https://www.atsdr.cdc.gov/placeandhealth/svi/at-a-glance_svi.html

NOAA National Centers for Environmental information, Climate at a Glance: County Time Series, published March 2022, retrieved on April 7, 2022 from <https://www.ncdc.noaa.gov/cag/>

Heat

HEAT.gov

United States Census Bureau

<https://data.census.gov/cedsci/profile?g=1600000US4872368>

Reference Plans

2012 City of Texarkana EOP

2022 Bowie County EOP

City of Mesquite EOP

City of Tarrant Co EOP

City of Georgetown EOP

City of Sugarland

Guidance

FEMA Local Mitigation Planning Workbook, May 2023

Texas Review Tool

Hazus Estimated Annualized Earthquake Losses for the US (FEMA P-366) April 2017

Existing Plans

Texarkana 2018 Comprehensive Plan

City-wide Flood Protection Planning Study for the City of Texarkana, Texas (January 2012)

2015-2040 Metropolitan Transportation Plan

2018 Regional Active Transportation Master Plan

2018 Texarkana Tactical Urbanism Application, Permit & Implementation Guide

2018 Texarkana University Planned Development District (UPDD)

2018 Development Standards and Preservation Criteria for the Highland Park – Bingham Park Historic Residential Overlay District

2015-2040 Metropolitan Transportation Plan: In 2014, the Texarkana Metropolitan Planning Organization (MPO) adopted a long-range transportation plan for the Texarkana region to guide transportation investments through the year 2040. Recommendations for multi-modal improvements were made for the entire Texarkana Region and emphasis is placed on regional development projects such as the State Line Corridor restoration, Texarkana Main Street Program, and redevelopment of the TexAmericas Center.

2009 Texarkana Bicycle and Pedestrian Master Plan: The MPO has also conducted a region-wide bicycle and pedestrian plan to assess opportunities and constraints to make the city more accessible to non-drivers. Some of the major recommendations as a result of this process include establishing an advisory panel, including bicycle/pedestrian infrastructure when rebuilding roads, building sidewalks in new subdivisions, collecting crash information data, and educating the public on how bicycles and cars can share the road.