

WICHITA COUNTY HAZARD MITIGATION ACTION PLAN



UPDATE 2024

July 1, 2024 - June 30, 2029

Maintaining a Safe, Secure,
and Sustainable Community



H2O
PARTNERS

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FEMA

July 25, 2024

Jennifer Charlton-Faia, Deputy State Hazard Mitigation Officer
Texas Division of Emergency Management
P.O. Box 285
Del Valle, Texas 78617-9998

RE: Additional Approval to the Wichita County, Texas Multi-Jurisdiction Hazard Mitigation Plan

Dear Jennifer Charlton-Faia:

This office has concluded its review of the referenced plan, in conformance with the Final Rule on Mitigation Planning (44 CFR § 201.6). We are pleased to provide our approval of this new jurisdiction in meeting the criteria set forth by this Agency. By receiving this approval, the additional adopting jurisdictions, as well as the attached list of approved plan participants, retain eligibility for the Hazard Mitigation Assistance grants. This five-year period is concurrent with the original approval of this plan, which was issued on July 1, 2024 and will expire on June 30, 2029.

This approval does not demonstrate approval of projects contained in the plan. This office has provided the enclosed Local Hazard Mitigation Planning Tool with reviewer's comments, to further assist the community in refining the plan going forward. Please advise the referenced participants of this approval.

If you have any questions, please contact David Freeborn, HM Community Planner, at (940) 898-5323.

Sincerely,

A handwritten signature in black ink, appearing to read "Ronald C. Wanhanen".

Ronald C. Wanhanen
Chief, Risk Analysis Branch

Enclosures: Approved Participants

cc: Anne Lehnick

Approved Participants

Attached is the list of approved participating governments included in the July 25, 2024 review of the referenced Hazard Mitigation plan.

Community Name

- | |
|----------------------------------|
| 1) Burkburnett city |
| 2) Cashion Community city |
| 3) Electra city |
| 4) Iowa Park city |
| 5) Pleasant Valley town |
| 6) Wichita County |
| 7) Wichita Falls city |

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BACKGROUND

Wichita County is in North Texas, neighboring the Oklahoma border. The largest city and county seat, Wichita Falls, is 144 miles northwest of Dallas. Wilbarger County is adjacent to the west, Baylor County borders the southwest portion of the county, Archer County is adjacent south, and Clay County lies to the east. Bordering from the north are Tillman County and Cotton County (northwest), which are both located in the State of Oklahoma.

Texas is prone to extremely heavy rains and flooding with half of the world record rainfall rates (48 hours or less).¹ While flooding is a well-known risk, Wichita County is susceptible to a wide range of natural hazards, including but not limited to tornadoes, extreme heat, windstorms, and drought. These life-threatening hazards can destroy property, disrupt the economy, and lower the overall quality of life for individuals.

While it is impossible to prevent an event from occurring, the impacts from many hazards on people and property can be lessened through mitigation. The Federal Emergency Management Agency (FEMA) defines mitigation as *sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects*.² Communities participate in hazard mitigation by developing hazard mitigation plans. The Texas Division of Emergency Management (TDEM) is required to review the plan and FEMA has the authority to review and approve hazard mitigation plans through the Disaster Mitigation Act of 2000.

The Disaster Mitigation Act requires that hazard mitigation plans be reviewed and revised every five years to maintain eligibility for Hazard Mitigation Assistance (HMA) grant funding. In 2017, Wichita County updated their 2012 Hazard Mitigation Action Plan (HMAP), including the following participating jurisdictions: City of Burkburnett, City of Cashion Community, City of Electra, City of Iowa Park, and City of Pleasant Valley. FEMA approved the Wichita County HMAP in March of 2018, which expired in 2023. The City of Wichita Falls participated in a single-jurisdictional hazard mitigation plan, receiving FEMA approval in November of 2020. They have joined the County and other participating jurisdictions within this Plan Update. The County began the process of developing a Hazard Mitigation Plan Update in order to regain eligibility for grant funding. The HMAP Update planning process provided an opportunity for Wichita County to evaluate successful mitigation actions and explore opportunities to avoid future disaster loss.

Wichita County selected H2O Partners, Inc. to write and develop the 2024 HMAP Update, hereinafter titled: “Wichita County Hazard Mitigation Plan Update 2024: Maintaining a Safe, Secure, and Sustainable Community” (Plan or Plan Update). This is a multi-jurisdictional plan; the

¹ <http://www.floodsafety.com/texas/regional-info/san-antonio-flooding/>

² <http://www.fema.gov/hazard-mitigation-planning-resources>

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participating jurisdictions include: Wichita County, City of Burkburnett, City of Cashion Community, City of Electra, City of Iowa Park, City of Pleasant Valley, and City of Wichita Falls.

Hazard mitigation activities are an investment in a community's safety and sustainability. It is widely accepted that the most effective hazard mitigation measures are implemented at the local government level, where decisions on the regulation and control of development are ultimately made. A comprehensive review of a hazard mitigation plan addresses vulnerabilities to hazards that exist today and in the foreseeable future. Therefore, it is essential that a plan identify projected patterns of how future development will increase or decrease a community's overall hazard vulnerability.

SCOPE

The focus of the Plan Update is to identify activities to mitigate hazards classified as "high" or "moderate" risk, as determined through a detailed hazard risk assessment conducted for Wichita County and the participating jurisdictions. The hazard classification enables the participating jurisdictions to prioritize mitigation actions based on hazards which can present the greatest risk to lives and property in the geographic scope.

PURPOSE

The Plan Update was prepared by Wichita County, participating jurisdictions, and H2O Partners, Inc. The purpose of the Plan Update is to protect people and structures and to minimize the costs of disaster response and recovery. The goal of the Plan Update is to minimize or eliminate long-term risks to human life, property, operations, and the environment from known hazards by identifying risks and implementing cost-effective hazard mitigation actions. The planning process is an opportunity for participating jurisdictions within Wichita County, stakeholders, and the general public to evaluate and develop successful hazard mitigation actions to reduce future risk of loss of life and property damage resulting from a disaster in Wichita County.

The Mission Statement of the Plan Update is, *"Maintaining a secure and sustainable future through the revision and development of targeted hazard mitigation actions to protect life and property."*

Participating jurisdictions within Wichita County, and planning participants identified eleven natural hazards to be addressed by the Plan Update. The specific goals of the Plan Update are to:

- Provide a comprehensive update to the 2018 and 2020 HMAPs;
- Minimize disruption to participating jurisdictions within Wichita County following a disaster;
- Streamline disaster recovery by articulating actions to be taken before a disaster strikes to reduce or eliminate future damage;
- Demonstrate a firm local commitment to hazard mitigation principles;
- Serve as a basis for future funding that may become available through grants and technical assistance programs offered by the state or federal government. The Plan will enable participating jurisdictions within Wichita County to take advantage of rapidly developing mitigation grant opportunities as they arise; and
- Ensure that participating jurisdictions within Wichita County maintain eligibility for the full range of future federal disaster relief.

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AUTHORITY



The Plan is tailored specifically for participating jurisdictions within Wichita County and plan participants including Planning Team members, stakeholders, and the general public who participated in the Plan Update development process. The Plan complies with all requirements promulgated by the Texas Division of Emergency Management (TDEM) and all applicable provisions of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Section 104 of the Disaster Mitigation Act of 2000 (DMA 2000) (P.L. 106-390), and the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004 (P.L. 108-264), which amended the National Flood Insurance Act (NFIA) of 1968 (42 U.S.C. 4001, et al). Additionally, the Plan complies with the Interim Final Rules for the Hazard Mitigation Planning and Hazard Mitigation Grant Program (44 CFR, Part 201), which specify the criteria for approval of mitigation plans required in Section 322 of the DMA 2000 and standards found in FEMA's "Local Mitigation Policy Guide" (Effective April 19, 2023), and the "Local Mitigation Planning Handbook" (March 2013).

SUMMARY OF SECTIONS

Sections 1 and 2 of the Plan Update outline the Plan's purpose and development, including how Planning Team members, stakeholders, and members of the general public were involved in the planning process. Section 3 profiles Wichita County's population and economy.

Sections 4 through 15 present a hazard overview and information on individual natural hazards in the planning area. For each hazard, the Plan Update presents a description of the hazard, a list of historical hazard events, and the results of the vulnerability and risk assessment process.

Section 16 presents hazard mitigation goals and objectives. Section 17 gives an analysis for the previous actions and Section 18 presents hazard mitigation actions for Wichita County and the participating jurisdictions. Section 19 identifies Plan maintenance mechanisms.

The list of planning team members and stakeholders is located in Appendix A. Public survey results are analyzed and presented in Appendix B. Appendix C contains a detailed list of critical facilities for the area. Appendix D contains information regarding Dam locations within Wichita County. Appendix E contains information regarding workshops and meeting documentation. Capability Assessment results for participating jurisdictions within Wichita County are in Appendix F. Appendix G includes State and Federal Funding Opportunities.³

³ Information contained in some of these appendices are exempt from public release under the Freedom of Information Act (FOIA).



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PLANNING PROCESS

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PLAN PREPARATION AND DEVELOPMENT

Hazard mitigation planning involves coordination with various constituents and stakeholders to develop a more disaster-resistant community. Section 2 provides an overview of the planning process including the identification of key steps and a detailed description of how stakeholders and the public were involved.

OVERVIEW OF THE PLAN

Wichita County hired H2O Partners, Inc. (Consultant Team), to provide technical support and oversee the development of the Wichita County Hazard Mitigation Action Plan Update 2024. The Consultant Team used the Federal Emergency Management Agency (FEMA) “Local Mitigation Planning Policy Guide” (Effective April 19, 2023), and the “Local Mitigation Planning Handbook” (March 2013) to develop the Plan Update. The overall planning process is shown in Figure 2-1 below.

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Figure 2-1. Mitigation Planning Process



Wichita County, participating jurisdictions, and the Consultant Team met in February 2023 to begin organizing resources, identify Planning Team members, and conduct a capability assessment.

PLANNING TEAM

Key members of H2O Partners, Inc. developed the Plan Update in conjunction with the Planning Team. The Planning Team was established using a direct representation model. Some of the responsibilities of the Planning Team included: completing capability assessment surveys, providing input regarding the identification of hazards, identifying mitigation goals, and developing mitigation strategies. An Executive Planning Team consisting of key personnel involved in hazard mitigation activities from each of the participating jurisdictions within Wichita County, shown in Table 2-1, was formed to coordinate planning efforts and request input and participation in the planning process. Participation in this planning process is defined as being engaged in the process through attending meetings, providing data and related information, providing updates on previous actions, and reviewing and commenting on draft versions of the plan. Table 2-2 reflects the Advisory Planning Team, consisting of additional representatives from area organizations and departments from the participating jurisdictions within Wichita County that participated throughout the planning process. All Executive and Advisory Planning Team members are involved in hazard mitigation activities; those with the authority to regulate development are identified with an asterisk next to their title.

Table 2-1. Executive Planning Team

ORGANIZATION / DEPARTMENT	TITLE
Wichita County	Assistant Emergency Management Coordinator
Wichita County	Emergency Management Coordinator
City of Burkburnett	Fire Chief

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ORGANIZATION / DEPARTMENT	TITLE
City of Cashion Community	Mayor*
City of Electra	City Manager*
City of Iowa Park	City Manager*
City of Pleasant Valley	City Administrator*
City of Wichita Falls	Emergency Management Coordinator

Table 2-2. Advisory Planning Team

ORGANIZATION / DEPARTMENT	TITLE
Wichita County	County Judge*
Wichita County	County Commissioner Pct 1*
Wichita County	County Commissioner Pct 2*
Wichita County	County Commissioner Pct 3*
Wichita County	County Commissioner Pct 4*
Wichita County	County Point of Contact for Medical Arena
City of Burkburnett	Chamber of Commerce Board Vice President / Public Safety
City of Burkburnett	City Manager* / Public Safety Director
City of Burkburnett	Director of Administration
City of Cashion Community	Emergency Management Coordinator
City of Cashion Community	Mayor Pro-Tem*
City of Electra	City Secretary*
City of Electra	Fire Chief
City of Electra	Mayor*
City of Electra	Police Chief
City of Iowa Park	City Secretary*
City of Iowa Park	Fire Chief
City of Iowa Park	Mayor*
City of Pleasant Valley	Mayor*

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ORGANIZATION / DEPARTMENT	TITLE
City of Wichita Falls	Emergency Management Intern
City of Wichita Falls	Deputy Director of Public Works
City of Wichita Falls	Director of Development Services ^{*1}

Additionally, a Stakeholder Group was invited via email to participate in the planning process by attending meetings, commenting on draft versions of the plan, and / or by providing data to inform the planning process. The Consultant Team, Planning Teams, and Stakeholder Group coordinated to identify mitigation goals, and develop mitigation strategies and actions for the Plan. Appendix A provides a complete listing of all participating Planning Team members and stakeholders from participating jurisdictions within Wichita County by organization and title. Stakeholder involvement is discussed further below.

Based on results of completed capability assessments, participating jurisdictions within Wichita County described methods for achieving future hazard mitigation measures by expanding existing capabilities. For example, each jurisdiction has an opportunity to identify opportunities for cross-training or increasing the technical expertise of staff by attending free training available through FEMA and the Texas Division of Emergency Management (TDEM) by monitoring classes and availability through [preparingtexas.org](https://www.preparingtexas.org). In addition, each jurisdiction can identify Planning Team members with the authority to monitor the Plan and identify grant funding opportunities for expanding staff. Other options for improving capabilities for each jurisdiction include the following:

Table 2-3. Opportunities for Improving and Expanding Existing Capabilities by Jurisdiction

JURISDICTION	OPPORTUNITIES
Wichita County	<ul style="list-style-type: none"> Develop a Capital Improvement Plan based on information in the risk assessment and identified mitigation projects within the HMAP. Review current floodplain ordinances for opportunities to increase resiliency such as modifying permitting. Developing land use and building ordinances that will require all new developments to confirm to the highest mitigation standards.
City of Burkburnett	<ul style="list-style-type: none"> Integrate risk information from HMAP into future updates to Capital Improvements Plan. Review current floodplain ordinances for opportunities to increase resiliency such as modifying permitting or building codes.
City of Cashion Community	<ul style="list-style-type: none"> Develop a Capital Improvement Plan based on information in the risk assessment and identified mitigation projects within the HMAP. Review current floodplain ordinances for opportunities to increase resiliency such as modifying permitting. Developing land use and building ordinances that will require all new developments to confirm to the highest mitigation standards.

¹ This department oversees Building Inspections, Code Enforcement, Lake Lot Administration, Neighborhood Resources, Planning and Property Management.

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JURISDICTION	OPPORTUNITIES
City of Electra	<ul style="list-style-type: none">• Develop a Capital Improvement Plan based on information in the risk assessment and identified mitigation projects within the HMAP.• Review current floodplain ordinances for opportunities to increase resiliency such as modifying permitting or building codes.• Developing land use and building ordinances that will require all new developments to confirm to the highest mitigation standards.
City of Iowa Park	<ul style="list-style-type: none">• Develop a Capital Improvement Plan based on information in the risk assessment and identified mitigation projects within the HMAP.• Review current floodplain ordinances for opportunities to increase resiliency such as modifying permitting or building codes.
City of Pleasant Valley	<ul style="list-style-type: none">• Develop a Capital Improvement Plan based on information in the risk assessment and identified mitigation projects within the HMAP.• Review current floodplain ordinances for opportunities to increase resiliency such as modifying permitting or building codes.• Developing land use and building ordinances that will require all new developments to confirm to the highest mitigation standards.
City of Wichita Falls	<ul style="list-style-type: none">• Integrate risk information from HMAP into future updates to Comprehensive Plan.• Review current floodplain ordinances for opportunities to increase resiliency such as modifying permitting or building codes.

Sample hazard mitigation actions developed with similar hazard risk were shared in the meetings. These important discussions resulted in the development of multiple mitigation actions that are included in the Plan Update to further mitigate risk from natural hazards in the future.

The Planning Team developed hazard mitigation actions for mitigating risk from all of the identified hazards within this Plan Update, including potential flood, drought, and tornado events. These actions include but are not limited to drainage and stream evaluations and improvement projects throughout the county. Drought seems to be a concerning hazard for the planning area due to multiple projects listed to ensure adequate water supply and reduction of water contamination at Lake Kemp and the Red River Basin reservoirs. In addition, all participating jurisdictions have actively applied for a grant to assist in a community-wide tornado safe room project which continues to be a project that the planning area is actively pursuing.

PLANNING PROCESS

The process used to prepare the Plan Update followed the four major steps included at Figure 2-1. After the Planning Team was organized, a capability assessment was developed and distributed at the Kick-Off Workshop. Hazards were identified and assessed, and results associated with each of the hazards were provided at the Risk Assessment Workshop. Based on Wichita County's identified vulnerabilities, specific mitigation strategies were discussed and developed at the Mitigation Strategy Workshop. Finally, Plan maintenance and implementation procedures were developed and are included in Section 19. Participation of Planning Team members, stakeholders, and the public at each of the workshops is documented in Appendix E.

At the Plan development workshops held throughout the planning process described herein, the following factors were taken into consideration:

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- The nature and magnitude of risks currently affecting the community;
- Hazard mitigation goals to address current and expected conditions;
- Whether current resources will be sufficient for implementing the Plan Update;
- Implementation problems, such as technical, political, legal, and coordination issues that may hinder development;
- Anticipated outcomes; and
- How participating jurisdictions within Wichita County, agencies, and partners will participate in implementing the Plan Update.

KICKOFF WORKSHOP

The Kickoff Workshop was held on February 16, 2023 at the Wichita County Office of Emergency Management in the City of Wichita Falls. The initial workshop informed participating officials and key department personnel about how the planning process pertained to their distinct roles and responsibilities and engaged stakeholder groups that focus on vulnerable populations and underserved communities including, but not limited to Midwestern State University, local Volunteer Fire Departments (VFDs), local medical partners such as Wichita Falls Health District, state agencies such as TDEM and Texas A&M Forest Service (TAMFS), regional coordinators, and surrounding counties. In addition to the kickoff presentation, participants received the following information:

- Project overview regarding the planning process;
- Public survey access information;
- Hazard Ranking form; and
- Capability Assessment survey for completion.

A risk ranking exercise was conducted at the Kickoff Workshop to get input from the Planning Team and stakeholders pertaining to various risks from a list of natural hazards affecting the planning area. Participants ranked hazards high to low in terms of perceived level of risk, frequency of occurrence, and potential impact.

HAZARD IDENTIFICATION

At the Kickoff Workshop, and through e-mail and phone correspondence, the Planning Team conducted preliminary hazard identification. The Planning Team, in coordination with the Consultant Team, reviewed and considered a full range of natural hazards. Once identified, the teams narrowed the list to significant hazards by reviewing hazards affecting the area as a whole, the 2018 State of Texas Hazard Mitigation Plan, and initial study results from reputable sources such as federal and state agencies. Based on this initial analysis, the teams identified a total of eleven natural hazards which pose a significant threat to the planning area.

RISK ASSESSMENT

An initial risk assessment for participating jurisdictions within Wichita County was completed in April 2023 and results were presented to Planning Team members at the Risk Assessment Workshop held on April 20, 2023, at the Wichita County Office of Emergency Management in the City of Wichita Falls. At the workshop, the characteristics and consequences of each hazard were evaluated to determine the extent to which the planning area would be affected in terms of potential danger to property and citizens.

Property and crop damages were estimated by gathering data from the National Centers for Environmental Information (NCEI) and National Oceanic and Atmospheric Administration

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(NOAA). The assessment also examined the impact of various hazards on the built environment, including general building stock, critical facilities, lifelines, and infrastructure. The resulting risk assessment profiled hazard events which provided information on previous occurrences, estimated probability of future events, and detailed the spatial extent and magnitude of impact on people and property. Each participant at the Risk Assessment Workshop was provided a risk ranking sheet that asked participants to rank hazards in terms of the probability or frequency of occurrence, extent of spatial impact, and the magnitude of impact. The results of the ranking sheets identified unique perspectives on varied risks throughout the planning area.

The assessments were also used to set priorities for hazard mitigation actions based on potential loss of lives and dollar losses. A hazard profile and vulnerability analysis for each of the hazards can be found in Sections 4 through 15.

MITIGATION REVIEW AND DEVELOPMENT

Developing the Mitigation Strategy for the Plan involved identifying mitigation goals and new mitigation actions. A Mitigation Workshop was held on June 15, 2023, at the Wichita County Office of Emergency Management in the City of Wichita Falls. In addition to the Planning Team, stakeholder groups were invited to attend the workshop. Regarding hazard mitigation actions, workshop participants emphasized the desire for tornado projects. Additionally, the participating jurisdictions were proactive in identifying mitigation actions to lessen the risk of all the identified hazards included in the Plan Update.

An inclusive and structured process was used to develop and prioritize new hazard mitigation actions for the Plan Update. The prioritization method was based on FEMA's STAPLE+E criteria and included social, technical, administrative, political, legal, economic, and environmental considerations. As a result, each Planning Team Member assigned an overall priority to each hazard mitigation action. The overall priority of each action is reflected in the hazard mitigation actions found in Section 18.

Planning Team members then developed action plans identifying proposed actions, costs and benefits, the responsible organization(s), effects on new and existing buildings, implementation schedules, priorities, and potential funding sources.

Specifically, the process involved:

- Listing optional hazard mitigation actions based on information collected from previous plan reviews, studies, and interviews with federal, state, and local officials. Workshop participants reviewed the optional mitigation actions and selected actions that were most applicable to their area of responsibility, cost-effective in reducing risk, easily implemented, and likely to receive institutional and community support.
- Workshop participants inventoried federal and state funding sources that could assist in implementing the proposed hazard mitigation actions. Information was collected, including the program name, authority, purpose of the program, types of assistance and eligible projects, conditions on funding, types of hazards covered, matching requirements, application deadlines, and a point of contact.
- Planning Team members considered the benefits that would result from implementing the hazard mitigation actions compared to the cost of those projects. Although detailed cost-benefit analyses were beyond the scope of the Plan Update, Planning Team members utilized economic evaluation as a determining factor between hazard mitigation actions.

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- Planning Team members then selected and prioritized mitigation actions.

Hazard mitigation actions identified in the process were made available to the Planning Team for review. The draft Plan Update was maintained on file by Wichita County and participating jurisdictions and was made available to the general public for review.

REVIEW AND INCORPORATION OF EXISTING PLANS

REVIEW

Background information utilized during the planning process included various studies, plans, reports, and technical information from sources such as FEMA, the United States Army Corps of Engineers (USACE), the U.S. Fire Administration, National Oceanic and Atmospheric Administration (NOAA), the Texas Water Development Board (TWDB), the Texas Commission on Environmental Quality (TCEQ), the Texas State Data Center, Texas A&M Forest Service (TAMFS), the Texas Division of Emergency Management (TDEM), and local hazard assessments and plans. Section 4 and the hazard-specific sections of the Plan (Sections 5-15) summarize the relevant background information.

Specific background documents, including those from FEMA, provided information on hazard risk, hazard mitigation actions currently being implemented, and potential mitigation actions. Previous hazard events, occurrences, and descriptions were identified through NOAA's National Centers for Environmental Information (NCEI). Results of past hazard events were found through searching the NCEI. The USACE studies were reviewed for their assessment of risk and potential projects in the region. Information from the State Demographer was reviewed for population and other projections and included in Section 3 of the Plan. Data from the Texas A&M Forest Service was used to appropriately rank the wildfire hazard, and to help identify potential grant opportunities. Materials from FEMA and TDEM were reviewed for guidance on Plan Update development requirements.

INCORPORATION OF EXISTING PLANS INTO THE HMAP PROCESS

A capability assessment was completed by key departments from the participating jurisdictions within Wichita County which provided information pertaining to existing plans, policies, ordinances, and regulations to be integrated into the goals and objectives of the Plan Update. The relevant information was included in a master capability assessment, Appendix F.

Existing projects and studies were utilized as a starting point for discussing hazard mitigation actions among Planning and Consultant Team members. For example, Wichita County has completed several actions, including soliciting public interest to develop a voluntary buy-out program after the 2015 flood, adopting National Flood Insurance Program (NFIP) requirements within their 2021 Floodplain Development Ordinance, and multiple communication outreach programs to promote hazard awareness and mitigation measures. The City of Iowa Park completed multiple mitigation projects from the previous plan, including hydrologic and hydraulic analysis of the North Fork Buffalo Creek Reservoir Dam, Lake Iowa Park Dam, and the Gordon Lake Dam, and developed an Emergency Operations Plan and Maintenance Manual based on the analysis; pre-positioned barricades and signage on three roadways that typically flood; in addition to adopting the 2015 International Building Codes and updating of their Drought Contingency Plan. The City of Wichita Falls adopted the 2018 Water Conservation and Drought

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Contingency Plan as well as incorporated flood mitigation actions to East Plum Creek by constructing culverts and widening channels.

Additionally, policies and ordinances were reviewed by several of the participating jurisdictions. These jurisdictions have included actions to develop and adopt higher building code standards. Other plans were reviewed, such as Capital Improvement Plans and Emergency Operations Plan, to identify any additional mitigation actions. Finally, the 2018 State of Texas Hazard Mitigation Plan, developed by TDEM, was discussed in the initial planning meeting in order to develop a specific group of hazards to address in the planning effort. The 2018 State Plan was also used as a guidance document, along with FEMA materials, in the development of the Wichita County Hazard Mitigation Action Plan Update 2024.

INCORPORATION OF THE HMAP INTO OTHER PLANNING MECHANISMS

Planning Team members will integrate implementation of the Plan Update with other planning mechanisms for Wichita County, such as the Emergency Operations Plan. Existing plans for participating jurisdictions will be reviewed and incorporated into the Plan Update, as appropriate. This section discusses how the Plan will be implemented by the participating jurisdictions within Wichita County. It also addresses how the Plan will be evaluated and improved over time, and how the public will continue to be involved in the hazard mitigation planning process.

Participating jurisdictions within Wichita County will be responsible for implementing hazard mitigation actions contained in Section 18. Each hazard mitigation action has been assigned to a specific county or city department that is responsible for tracking and implementing the action.

A funding source has been listed for each identified hazard mitigation action and may be utilized to implement the action. An implementation time period has also been assigned to each hazard mitigation action as an incentive and to determine whether actions are implemented on a timely basis.

Participating jurisdictions within Wichita County will integrate hazard mitigation actions contained in the Plan Update with existing planning mechanisms such as ordinances, Emergency Operations or Management Plans, and other local and area planning efforts. Wichita County will work closely with area organizations to coordinate implementation of hazard mitigation actions that benefit the planning area in terms of financial and economic impact.

Upon formal adoption of the Plan Update, Planning Team members from the participating jurisdictions will review existing plans along with building codes to guide development and ensure that hazard mitigation actions are implemented. Each of the jurisdictions will be responsible for coordinating periodic review of the Plan Update with members of the Advisory Planning Team to ensure integration of hazard mitigation strategies into these planning mechanisms and codes. The Planning Team will also conduct periodic reviews of various existing planning mechanisms and analyze the need for any revisions or updates in light of the approved Plan Update. Participating jurisdictions within Wichita County will ensure that future long-term planning objectives will contribute to the goals of the Plan to reduce the long-term risk to life and property from moderate and high-risk hazards. Within one year of formal adoption of the Plan, existing planning mechanisms will be reviewed and analyzed as they pertain to the Plan Update.

Planning Team members will review and revise, as necessary, the long-range goals and objectives in its strategic plan and budgets to ensure that they are consistent with the Plan Update.

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Furthermore, Wichita County will work with neighboring jurisdictions to advance the goals of the Plan Update as it applies to ongoing, long-range planning goals and actions for mitigating risk to natural hazards throughout the planning area.

Table 2-4 identifies types of planning mechanisms and examples of methods for incorporating the Plan into other planning efforts.

Table 2-4. Examples of Methods of Incorporation

PLANNING MECHANISM	INCORPORATION OF PLAN
Annual Budget Review	Various departments and key personnel that participated in the planning process for participating jurisdictions within Wichita County will review the Plan and mitigation actions therein when conducting their annual budget review. Allowances will be made in accordance with grant applications sought, and mitigation actions that will be undertaken, according to the implementation schedule of the specific action.
Capital Improvement Plans	Several participating jurisdictions within Wichita County have a Capital Improvement Plan (CIP) in place or under development. Prior to any revisions to the CIP, city departments will review the risk assessment and mitigation strategy sections of the HMAP, as limiting public spending in hazardous zones is one of the most effective long-term mitigation actions available to local governments.
Comprehensive Plans	The City of Wichita Falls has a Long-term Comprehensive Development Plans 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.
Floodplain Management Plans	Floodplain management plans include preventative and corrective actions to address the flood hazard. Therefore, the actions for flooding and information discussing the people and property at risk to flood found in Section 7 of this Plan Update will be reviewed and revised when participating jurisdictions within Wichita County update their management plans or develops new plans.
Grant Applications	The Plan will be evaluated by participating jurisdictions within Wichita County when grant funding is sought for mitigation projects. If a project is not in the Plan Update, a Plan Revision may be necessary to include the action in the Plan.
Regulatory Plans	Currently, several participating jurisdictions within Wichita County have regulatory plans in place, such

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PLANNING MECHANISM	INCORPORATION OF PLAN
	as Emergency Management Plans, Continuity of Operations Plans, Land Use Plans, and Evacuation Plans. The Plan Update will be consulted when county and city departments review or revise their current regulatory planning mechanisms, or in the development of regulatory plans that are not currently in place.

Appendix F Capability Assessment provides an overview of Planning Team members' existing planning and regulatory capabilities. These existing capabilities provide the mechanisms to implement the mitigation strategy objectives. For example, the adoption of building codes and implementation of land use regulations have been demonstrated to help communities avoid losses from natural hazard events. The City of Iowa Park adopted the 2015 International Building Code, effective November 14, 2016. While Wichita County and the remaining participating jurisdictions have yet to formally adopt the 2015 IBC, the County recommends that builders follow IBC and NFPA codes.

It should be noted for the purposes of the Plan Update that the HMAP has been used as a reference when reviewing and updating all plans and ordinances for the entire planning area, including all participating jurisdictions. The Emergency Management Plans developed for Wichita County, City of Burkburnett, City of Cashion Community, City of Electra, City of Iowa Park, City of Pleasant Valley, and City of Wichita Falls are updated every 5 years and incorporates goals, objectives and actions identified in the mitigation plan.

PLAN REVIEW AND PLAN UPDATE

As with the development of Plan Update, participating jurisdictions within Wichita County will oversee the review and update process for relevance and if necessary, make adjustments. At the beginning of each fiscal year, Planning Team members will meet to evaluate the Plan and review other planning mechanisms to ensure consistency with long-range planning efforts. In addition, planning participants will also meet once a year, by conference call or presentation, to re-evaluate prioritization of the hazard mitigation actions. The plan may be amended to include additional hazard mitigation actions as they are developed.

TIMELINE FOR IMPLEMENTING MITIGATION ACTIONS

Both the Executive Planning Team (Table A-1, Appendix A) and the Advisory Planning Team (Table A-2, Appendix A) will engage in discussions regarding a timeframe for how and when to implement each hazard mitigation action. Considerations include when the action will be started, how existing planning mechanisms' timelines affect implementation, and when the action should be fully implemented. Timeframes may be general, and there will be short, medium, and long-term goals for implementation based on prioritization of each action, as identified on individual Hazard Mitigation Action worksheets included in the Plan Update for participating jurisdictions within Wichita County.

Both the Executive and Advisory Planning Team will evaluate and prioritize the most suitable hazard mitigation actions for the community to implement. The timeline for implementation of actions will partially be directed by participating jurisdictions' comprehensive planning process,

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budgetary constraints, and community needs. Participating jurisdictions within Wichita County are committed to addressing and implementing hazard mitigation actions that may be aligned with and integrated into the Plan Update.

Overall, the Planning Team is in agreement that goals and actions of the Plan Update shall be aligned with the timeframe for implementation of hazard mitigation actions with respect to annual review and updates of existing plans and policies.

PUBLIC AND STAKEHOLDER INVOLVEMENT

An important component of hazard mitigation planning is public participation and stakeholder involvement. Input from individual citizens and the community as a whole provides the Planning Team with a greater understanding of local concerns and increases the likelihood of successfully implemented hazard mitigation actions. If citizens and stakeholders, such as local businesses, non-profits, hospitals, and schools are involved, they are more likely to gain a greater appreciation of the risks that hazards may present in their community and take steps to reduce or mitigate their impact.

The public was involved in the development of the Wichita County Hazard Mitigation Action Plan Update 2024 at different stages prior to official Plan approval and adoption. Public input was sought using three methods: (1) open public meetings; (2) survey instruments; and (3) making the draft Plan Update available for public review on participating jurisdictions' websites.

The planning team worked to identify local agencies, organizations and community leaders that focus on reaching vulnerable populations and underserved communities. These organizations were included in the planning process as stakeholders and were invited to participate in the planning process via email (Tables 2-5) including the American Red Cross, Central Texas Food Bank, Disaster Helping Hands Inc., Interfaith Ministries of Wichita Falls, Meals on Wheels, United Way, Wichita County Human Services Department and Public Health District, Zavala Hispanic Cultural Initiative, and area Independent School Districts. In addition, public notices were posted on bulletin boards in public facilities including at the Wichita County Courthouse and the Wichita County Sheriff's Office. The City of Electra also included public notification on the city's utility online bill pay site.

The draft Plan Update was made available to the general public for review and comment on participating jurisdictions' websites. The public was notified at the public meetings that the draft Plan Update would be available for review. No feedback was received on the draft Plan Update, although it was given on the public survey, and all relevant information was incorporated into the Plan Update. Public input was utilized to assist in identifying hazards that were of most concern to the citizens of the county and what actions they felt should be included and prioritized.

The Plan Update will be advertised and posted on Wichita County and participating jurisdictions' websites upon approval from FEMA, and a copy will be kept at Wichita County Office of Emergency Management.

STAKEHOLDER INVOLVEMENT

Stakeholder involvement is essential to hazard mitigation planning since a wide range of stakeholders can provide input on specific topics and from various points of view. Throughout the planning process, members of community groups, local businesses, neighboring jurisdictions, schools, and hospitals were invited to participate in development of the Plan Update. The

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Stakeholder Group (Table A-3 in Appendix A, and Table 2-4, below), included a broad range of representatives from both the public and private sector and served as a key component in Wichita County's outreach efforts for development of the Plan Update. Documentation of stakeholder meetings is found in Appendix E. A list of organizations invited to attend via email is found in Table 2-5.

Table 2-5. Stakeholder Working Group

AGENCY	TITLE	PARTICIPATED
American Medical Response	Operations Manager	
American Red Cross	Chief Development Officer	
American Red Cross	Chief Operations Officer	
American Red Cross	Regional Disaster Officer	
Archer County	Emergency Management Coordinator	
Atmos	Operations Representative	X
Baylor County	County Judge	
Burkburnett ISD	Director of Facilities	
Burkburnett ISD	Superintendent	
Central Texas Food Bank	Media Inquiries Representative	
City View ISD	ISD Chief of Police	
City View ISD	Superintendent	
Clay County	Emergency Management Coordinator	X
Disaster Helping Hands Inc.	Agency Representative	
Electra ISD	Administrative Assistant for the Superintendent	
Electra ISD	Maintenance Coordinator	
Environmental Protection Agency, Region 6	Director of Superfund and Emergency Management Division	
Environmental Protection Agency, Region 6	Regional Administrator	
Friberg-Copper Water Supply Corporation	Utility Contact	
Hotter'N Hell Hundred / Wichita Falls Bicycling Club	Executive Director	X
Interfaith Ministries of Wichita Falls	Executive Director	

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AGENCY	TITLE	PARTICIPATED
Iowa Park ISD	ISD Safety and Security Secretary	
Iowa Park ISD	Superintendent	
Magic Aire	Operational Engineer	X
Mark Inman Insurance Agency	Insurance Representative	X
Meals on Wheels	General Representative	
Midwestern Healthcare Center	General Representative	
Midwestern State University	Chemical Safety Manager	X
Midwestern State University	Chief of Police	
Midwestern State University	Director of Board and Government Relations	
National Weather Service	District (Oklahoma) Representative	
NOAA	Assistant Administrator National Env. Satellite, Data, and Info Service	
NOAA	Deputy Assistant Administrator National Env. Satellite, Data, and Info Service	
NORTEX Regional Planning Commission	Director of Emergency Planning	
NORTEX Regional Planning Commission	Emergency Planner	X
NORTEX Regional Planning Commission	Executive Director	
Red River Authority	General Manager	
Region 1 Flood Planning Group	Region Representation	X
Sealed Air Corp.	Manufacturing Plant Environment Safety Coordinator	
Sheppard Air Force Base	Fire Chief	X
Sheppard Air Force Base	Fire Protection Specialist	X
Sheppard Air Force Base	General Representative	X
Sheppard Air Force Base	Firefighter	X
Texas A&M Agrilife Extension	District Representative of the Wichita County Office	

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AGENCY	TITLE	PARTICIPATED
Texas A&M Forest Service	Regional WUI Coordinator	X
Texas A&M Forest Service	Resource Specialist I	
Texas A&M Forest Service	Regional Representative	X
Texas Commission on Environmental Quality, Region 3	Executive Assistant	
Texas Commission on Environmental Quality, Region 3	Regional Director	
Texas Division of Emergency Management	District 3 Coordinator Representative for Wichita Falls	X
Texas Division of Emergency Management	Unit Chief Recovery - Mitigation Branch	X
Texas Department of Health Services, Region 2/3	DSHS Regional 2/3 Representative	
Texas Department of Housing and Community Affair	General Media Representative	
Texas Department of Transportation	District Engineer	
Texas Department of Transportation	Wichita Falls Engineer	
Texas Floodplain Management Association, Region 4	Region 4 Director	
Texas Health and Human Services Commission	General Representative	
Texas Historical Commission	Executive Director	
Texas Parks and Wildlife	District Leader for Cross Timbers Wildlife District, Wichita County	
Texas Parks and Wildlife	Game Warden	
Texas State Legislator	District 69 Representative	
Texas State Senate	District 28 Senator	
Texas State Senate	District 30 Senator	
Texas Water Development Board	Assistant Deputy Executive Administrator - Water Supply & Infrastructure	
Texas Water Development Board	Deputy Executive Administrator - Planning	

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AGENCY	TITLE	PARTICIPATED
Texas Water Development Board	Deputy Executive Administrator - Water Supply & Infrastructure	
Texas Windstorm Insurance Association	General Medical Representative	
U.S. Army Corps of Engineers / Texas Silver Jackets	Regional Representative	
U.S. Fish & Wildlife	Public Affairs Specialist for Texas	
U.S. Fish & Wildlife	State Coordinator for Texas, Partners for Fish and Wildlife Program	
United Regional Healthcare System	Life Safety Specialist	X
United Regional Healthcare System	Manager of Operations	X
United Way	Director of North Texas Area	
University Park Manor	General Representative	
Vernon College	Director of Campus Police	
Vernon College	University President	
Vitro Industries	Manufacturing Plant Senior EHS Leader	
Wichita County Human Services Department	General Representative	
Wichita Falls Health District	Preparedness Specialist	X
Wichita Falls ISD	Risk & Contract Manager	
Wichita Falls ISD	Superintendent	
Wichita Falls Public Health District	Public Health Preparedness Manager	X
Wichita Falls Public Health District	Public Health Specialist	X
Wichita Valley Water Supply Corporation	Corporation Representative	
Wilbarger County	County Judge	
Zavala Hispanic Cultural Initiative	Program Representative	

Stakeholders and participants from neighboring communities that attended the Planning Team and public meetings played a key role in the planning process. For example, floods were one of the concerns to stakeholders, so the City of Wichita Falls, in conjunction with Region 1 Flood

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Planning Group, included an action to evaluate county-wide streams, noting that this evaluation would identify viable solutions to reduce flooding for multiple channels identified within the county.

PUBLIC MEETINGS

A series of public meetings were held throughout the planning area to collect public and stakeholder input. Topics of discussion included the purpose of hazard mitigation, discussion of the planning process, and types of natural hazards. Each participating jurisdiction within Wichita County released information regarding the public meetings in their area to increase public participation in the Plan Update development process, through posting on their website, on social media sources including Facebook, through the local media, and / or posting the information on bulletin boards in public facilities. A sampling of these notices can be found in Appendix E, along with the documentation on the public meetings. Representatives from area neighborhood associations and area residents were invited to participate.

Public meetings were held on the following dates:

- February 16, 2023, Wichita County Office of Emergency Management
- April 20, 2023, Wichita County Office of Emergency Management
- June 15, 2023, Wichita County Office of Emergency Management

PUBLIC PARTICIPATION SURVEY

In addition to public meetings, the Planning and Consultant Teams developed a public survey designed to solicit public input during the planning process from citizens and stakeholders and to obtain data regarding the identification of any potential hazard mitigation actions or problem areas. The survey was promoted by local officials and a link to the survey was posted on participating jurisdictions' websites. A total of 26 surveys were completed online. The survey results are analyzed in Appendix B. Participating jurisdictions within Wichita County reviewed the input from the surveys and decided which information to incorporate into the Plan as hazard mitigation actions. For example, results indicate that tornado and thunderstorm wind are the hazards of highest concern for the public, and community / tornado shelter along with education and preparedness techniques were the actions indicated that the local government should take to mitigate risk to these hazards. As a result, the Planning Team has included mitigation actions related to tornado 'safe room' construction as well as implementing an education and awareness program to educate citizens and provide mitigation measures.



SECTION 3

COUNTY PROFILE

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OVERVIEW

Wichita County was created in 1858 and organized in 1882. The seat of government for the county, the City of Wichita Falls, is the largest city within the county and is located 144 miles northwest of Dallas. Wichita County is located in the north central portion of Texas, on the Oklahoma border, and is comprised of 633 square miles of which all is land except for 5 square miles of water. It is located primarily within the Central Texas Rolling Red Plains. The northwest quarter of the county drains into the Red River, with the middle and southeast quarters draining into the Wichita River.

Prior to becoming incorporated as a county, the area was home to Caddoan Native American tribes, primarily the Wichitas and Taovayas, who arrived from modern day Kansas and Nebraska in the mid-eighteenth century. This land in north central Texas was also claimed by the Lipan Apaches and Comanches, leading to conflict between the tribes. These disputes in the region largely stopped Anglo-Americans from settling in the area until 1850, when federal troops forced the Native Americans to relocate north of the Red River.

Before reaching a population of 433 in 1880, Wichita County was unorganized and sparsely populated. In 1882, a petition was presented to the Clay County commissioners court seeking independence for Wichita County. Over the next 150 years, the county developed gradually, with factors like the expansion of railroads, the founding of Call Field Army Air Corps training facility, and an oil boom expediting growth throughout that time.

The terrain in Wichita County consists of rolling plains with rounded slopes and shallow and broad valleys. The far southeastern corner of the county extends into the Central Texas Rolling Red Prairies. The elevation ranges from 900 to 1,200 feet above sea level. The county has an average annual precipitation of twenty-seven inches, temperatures ranging from an average low of 28°F in January to an average high of 98°F in July, and a growing season that averages 221 days a year.¹

Figure 3-1 shows the general location of Wichita County along with the cities that are located within the county.

¹ Wichita County. Wichita County | TX Almanac. (n.d.). <https://www.texasalmanac.com/places/wichita-county>

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Figure 3-1. Location of Wichita County

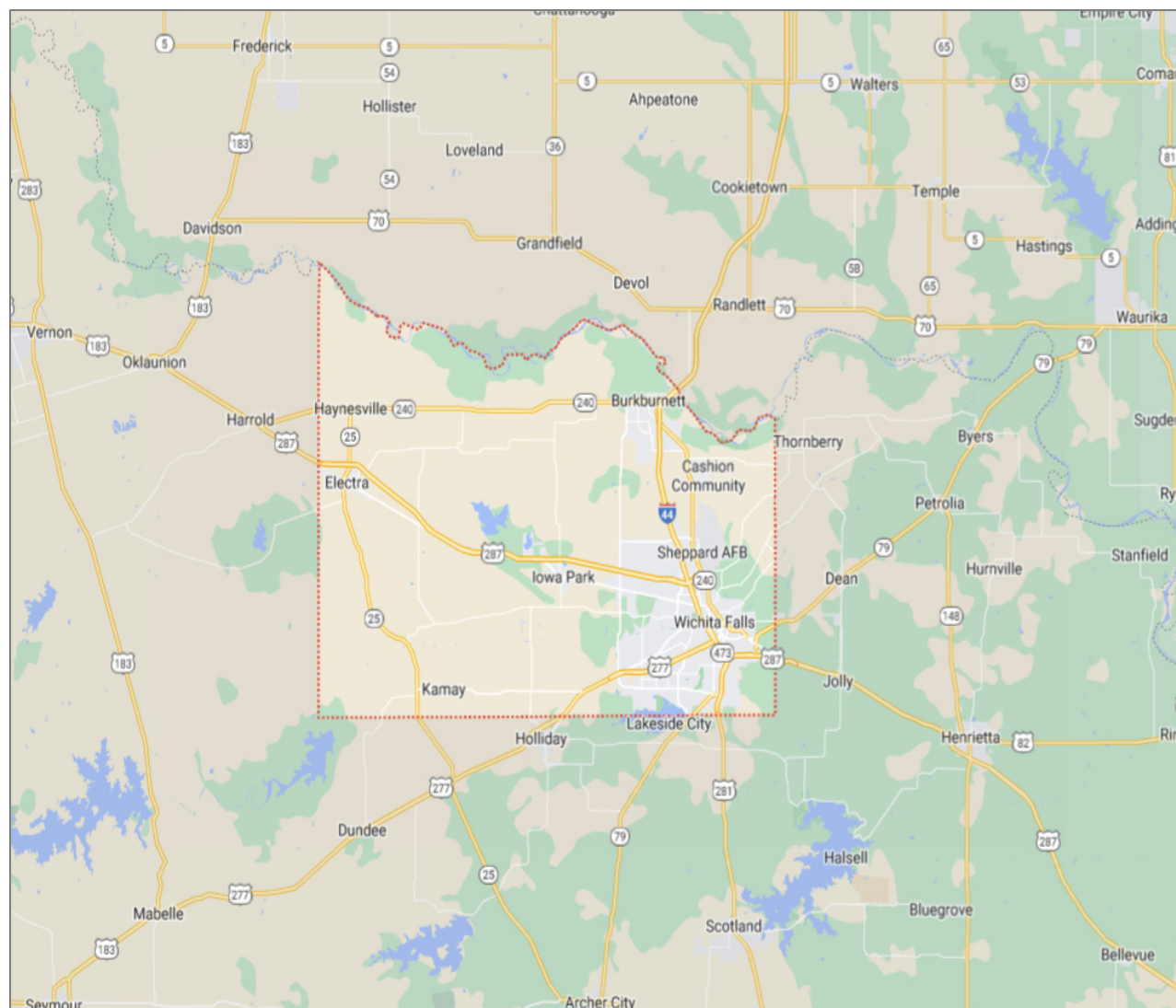
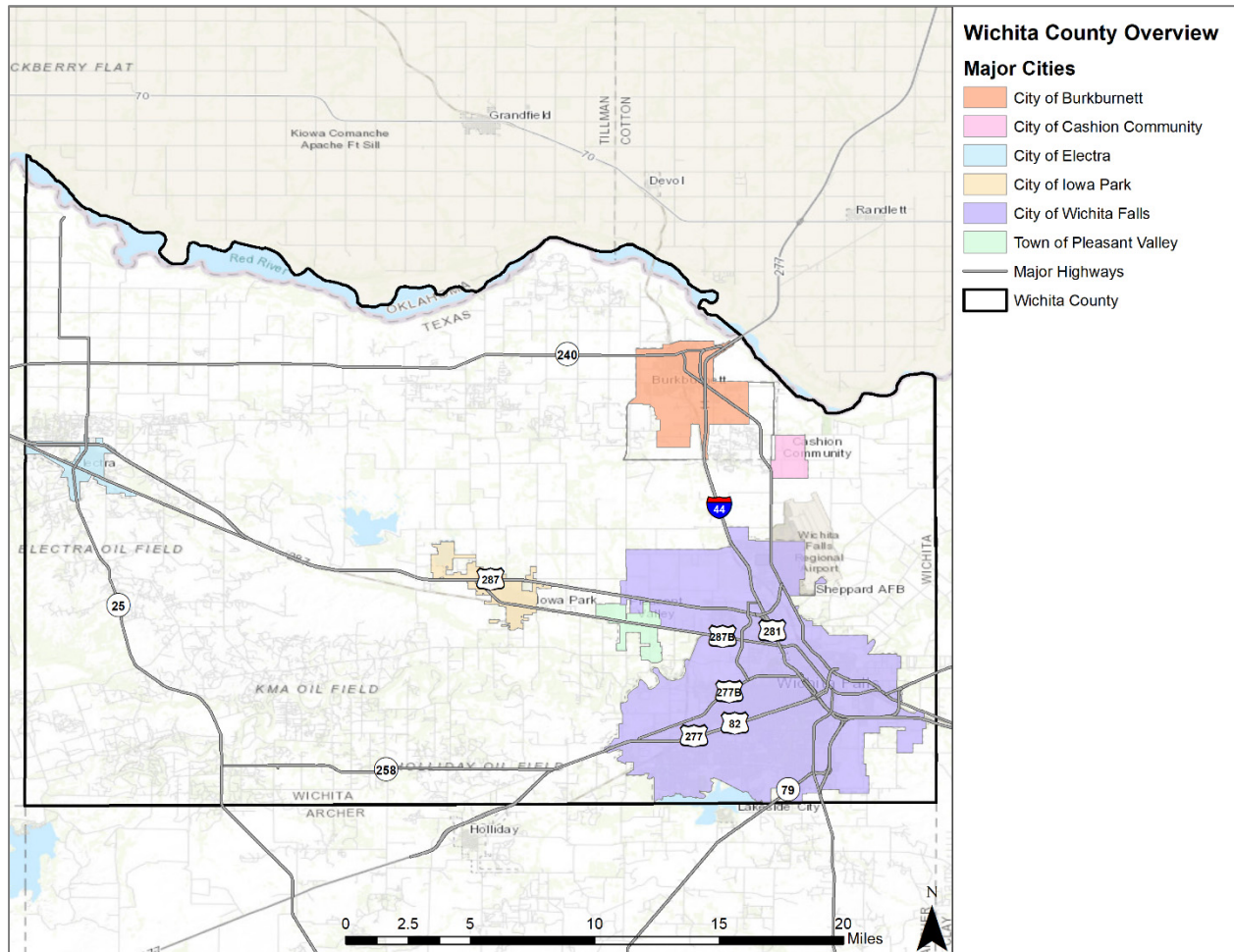


Figure 3-2 shows the participating jurisdictions within Wichita County that are covered in the risk assessment analysis of the Plan Update.

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Figure 3-2. Wichita County Planning Area



Provided in Table 3-1 below is a listing of the jurisdictions in Wichita County that participated in the Wichita County Hazard Mitigation Action Plan Update 2024.

Table 3-1. Participating Jurisdictions

PARTICIPATING JURISDICTIONS	
Wichita County	City of Iowa Park
City of Burk Burnett	City of Pleasant Valley
City of Cashion Community	City of Wichita Falls
City of Electra	

POPULATION AND DEMOGRAPHICS

According to the 2020 Census population count, Wichita County has an official population of 129,350 residents, a 2.0 percent decrease since the 2010 census. Table 3-2 summarizes select characteristics of vulnerable or sensitive populations in the Wichita County and the participating

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jurisdictions using data from the U.S. Census Bureau 2021 American Community Survey (ACS) five-year estimates. Note that in some cases, the 2021 ACS estimates may differ from the 2020 census counts; the ACS estimates are used throughout this section for consistency.²

Between official U.S. Census population counts, the estimate uses a formula based on new residential building permits and household size. It is simply an estimate and there are many variables involved in achieving an accurate estimation of people living in each area at a given time.

Table 3-2. Population Distribution by Jurisdiction

JURISDICTION	TOTAL 2020 POPULATION	TOTAL 2021 POPULATION	PERCENTAGE (based on 2021 Population)	ESTIMATED VULNERABLE OR SENSITIVE POPULATIONS ³		
				Youth (Under 5)	Elderly (Over 65)	Below Poverty Level
City of Burkburnett	10,939	10,851	8.38%	716	2,190	1,063
City of Cashion Community	286	309	0.24%	14	52	9
City of Electra	2,292	2,163	1.67%	126	469	497
City of Iowa Park	6,535	6,470	5.00%	779	1,184	524
City of Pleasant Valley	357	317	0.25%	20	67	25
City of Wichita Falls	102,316	102,563	79.25%	6,217	13,675	18,974
Unincorporated Wichita County	6,625	6,746	5.21%	256	1,295	390
Wichita County	129,350	129,419	100%	8,128	18,932	21,484

POPULATION GROWTH

The official 2020 Wichita County population is 129,350. Overall, Wichita County experienced an increase in population between 1980 and 2020 of 7 percent, or an increase of 8,268 residents. The City of Burkburnett experienced a slight increase in population between 1980 and 2020 of 3 percent, as well as the Cities of Iowa Park (6%), Pleasant Valley (7%) and Wichita Falls (9%). The City of Electra experienced a significant decrease (-39%) in population between 1980 and 2020. Between 2010 and 2020 the City of Burkburnett (1%) saw a slight increase in population, as well as the Cities of Iowa Park (3%) and Pleasant Valley (6%). The remaining jurisdictions experienced a decrease in population between 2010 and 2020.

Table 3-3 provides historic growth rates in Wichita County.

² Source: <https://demographics.texas.gov/Data/Decennial/2010/>, <https://www.census.gov/en.html> and <https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/2021/>

³ The Estimated Vulnerable or Sensitive Populations are based off the 2021 American Community Survey 5-Year Estimates Data Profiles.

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Table 3-3. Population Growth by Jurisdictions 1980-2020⁴

JURISDICTIONS	1980	1990	2000	2010	2020	POP CHANGE 1980-2020	PERCENT OF CHANGE	POP CHANGE 2010-2020	PERCENT OF CHANGE
City of Burkburnett	10,668	10,145	10,927	10,811	10,939	271	3%	128	1%
City of Cashion Community ⁵	-	-	-	348	286	-	-	-62	-18%
City of Electra	3,755	3,113	3,168	2,791	2,292	-1,463	-39%	-499	-18%
City of Iowa Park	6,184	6,072	6,431	6,355	6,535	351	6%	180	3%
City of Pleasant Valley	335	378	408	336	357	22	7%	21	6%
City of Wichita Falls	94,201	96,259	104,197	104,553	102,316	8,115	9%	-2,237	-2%
Unincorporated Wichita County	5,939	6,411	6,533	6,306	6,625	686	12%	319	5%
Wichita County	121,082	122,378	131,664	131,500	129,350	8,268	7%	-2,150	-2%

ECONOMIC IMPACT

Building and maintaining infrastructure depends on the economy, and therefore, protecting infrastructure from risk due to natural hazards in the planning area is important to the participating jurisdictions within Wichita County. Whether through 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.

Based on the American Community Survey 2021 five-year estimates, 57.5 percent of the population 16 years and over is employed in the labor force, not included the military. The per capita income is \$27,231 and the median household income countywide is \$53,272. It is estimated that 47 percent of households have incomes below \$50,000. Families with incomes below the poverty level in 2021 made up 10.9 percent of all families. Of families that have children under 18 years old, 17 percent are below the poverty level.

Table 3-4 and Table 3-5 show the various occupations and industries within Wichita County, according to the 2021 estimates by the American Community Survey.

Table 3-4. Occupations of Employed Population in Wichita County⁶

OCCUPATION	ESTIMATE	PERCENT
Civilian employed population 16 years and over	56,442	57.5%

⁴ U.S. Census Bureau

⁵ The City of Cashion Community was incorporated in 2000.

⁶ 2021 American Community Survey 5-Year Estimates Data Profiles.

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OCCUPATION	ESTIMATE	PERCENT
Management, business, science, and arts occupations	18,106	32.1%
Sales and office occupations	11,745	20.8%
Service occupations	11,533	20.4%
Production, transportation, and material moving occupations	9,295	16.5%
Natural resources, construction, and maintenance occupations	5,763	10.2%

Table 3-5. Industries of Employed Population in Wichita County⁷

INDUSTRY	ESTIMATE	PERCENT
Civilian employed population 16 years and over	56,442	43.6%
Educational services, and health care and social assistance	14,147	25.1%
Retail trade	7,626	13.5%
Arts, entertainment, and recreation, and accommodation and food services	6,263	11.1%
Manufacturing	5,146	9.1%
Professional, scientific, and management, and administrative and waste management services	3,838	6.8%
Transportation and warehousing, and utilities	3,592	6.4%
Construction	3,398	6.0%
Other services, except public administration	3,063	5.4%
Public administration	3,037	5.4%
Finance and insurance, and real estate and rental and leasing	2,775	4.9%
Agriculture, forestry, fishing and hunting, and mining	1,404	2.5%
Wholesale trade	1,305	2.3%
Information	848	1.5%

Table 3-6 shows the major employers within the City of Wichita Falls.

⁷ 2021 American Community Survey 5-Year Estimates Data Profiles.

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Table 3-6. Major Employers in the City of Wichita Falls ⁸

COMPANY	TOTAL EMPLOYED
U.S. Air Force	4,250
United Regional	2,305
Wichita Falls ISD (WFISD)	1,854
Midwestern State University	1,354
Local Government	1,223
Walmart	1,069
North Texas State Hospital	970
James V. Allred Unit Prison	939
United Supermarkets	823
Work Services Corporation	791
Cryovac	750
Burkburnett ISD	681
Howmet Aerospace	600

NATURAL, CULTURAL, AND HISTORIC RESOURCES

Wichita County's territory is composed of 633 square miles in the eastern part of the North Central Texas Rolling Red Plains, with an elevation ranging from 900 feet to 1,200 feet above sea level. The northwest part of the county is drained by the Red River and their tributaries, while the central and southeast corner of the county is drained by Wichita River. The topography within Wichita County consists of rolling plains with rounded slopes, and broad valleys. The Seymour and Cross Timbers aquifers are the major aquifers for groundwater resources within the county.⁹

Major waterways that assist in the drainage of the county include the Red River, which borders Wichita County, and is the second largest river associated with Texas. Wichita River, another major waterway, flows into the Red River. The Red River is utilized for recreational use. Wichita River is approximately 90 miles, running through Archer, Wichita, and Clay Counties joining the Red River. There are two reservoirs located on the Wichita River, Lake Kemp and Diversion Reservoir. Due to this junction, the Wichita River is considered a scenic river and represents a major recreational site within the north central portion of the State.¹⁰

⁸ <https://wichitafallschamber.com/largest-employers/>

⁹ Texas Water Development Board, <https://www.twdb.texas.gov/groundwater/aquifer/majors/trinity.asp>

¹⁰ An analysis of Texas waterways. TPWD. (n.d.).
https://tpwd.texas.gov/publications/pwdpubs/pwd_rp_t3200_1047/24_c_tx_san_saba_wichita.phtml#wichita

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Wichita County is primarily made up of one major physiographic region, the Rolling Plains. This ecoregion consists of rolling plains with rounded slopes and shallow and broad valleys. Vegetation in this region includes: mid-tall grasses; mesquite, shinnery oak, and cottonwood trees; and elm, hackberry and pecan trees along the streams. Within this region, soils can vary from coarse sands along outwash terraces that are adjacent to streams, to tight clays and shales¹¹.

To further understand natural resources that may be vulnerable to a hazard event, as well as those that need consideration when implementing mitigation activities, it is important to identify at-risk species (i.e., endangered species) in the planning area. An endangered species is any species of fish, plant life, or wildlife that is in danger of extinction throughout all or most of its range. A threatened species is a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Both endangered and threatened species are protected by law and any future hazard mitigation projects are subject to these laws. Candidate species are plants and animals that have been proposed as endangered or threatened but are not currently listed.

According to the U.S. Fish and Wildlife Service, as of May 2023, there are five federally endangered, proposed endangered, threatened, or candidate species in Wichita County. These species are listed in Table 3-7.

Table 3-7. Endangered Species in Wichita County¹²

TYPE OF SPECIES	COMMON NAME	SCIENTIFIC NAME	SPECIES STATUS
Birds	Whooping Crane	Grus Americana	Endangered
Insects	Monarch Butterfly	Danaus Plexippus	Candidate
Birds	Piping Plover	Charadrius Melodus	Threatened
Mammals	Tricolored Bat	Perimyotis Subflavus	Proposed Endangered
Birds	Red Knot	Calidris Canutus Rufa	Threatened

Wichita County has a rich history that is preserved through its designated historic buildings and sites. Throughout the county there are over ten buildings and sites listed on the National Register of Historic Places. Historic buildings are vulnerable to natural hazards as their construction pre-dates modern building codes. There are also historic preservation considerations and requirements for historic structures when they are included in mitigation or recovery projects.

¹¹ Texas ecoregions. Texas Ecoregions - Texas Parks & Wildlife Department. (2022, December 16). <https://tpwd.texas.gov/education/hunter-education/online-course/wildlife-conservation/texas-ecoregions>

¹² Untitled page. ECOS. (n.d.). <https://ecos.fws.gov/ecp/report/species-listings-by-region?statusCategory=Listed®ionNum=2®ionName=Southwest+Region+%28%29+&total=175>

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Table 3-8. Historic Properties Listed on the National Register of Historic Places¹³

PROPERTY NAME	LOCATION	ADDRESS
American Trust Building-Holiday Inn	Wichita Falls	726 Scott Ave.
Bailey-Moline-Filgo Building	Wichita Falls	1000-1004 Indiana Ave.
Beaver Creek Bridge	Electra	FM 2326
Depot Square Historic District	Wichita Falls	Roughly bounded by 8 th St., Indiana St., 5 th St. and MKT Railroad tracks
Freeear, W.A., Furniture Company-Maskat Shrine Temple Building	Wichita Falls	1100 Lamar Street
Hamilton, William Benjamin, House	Wichita Falls	1106 Brook Avenue
Hodges-Hardy-Chambers House	Wichita Falls	1100 Travis Street
Indiana Avenue Historic District	Wichita Falls	900-1008 Indiana Ave.
Kell, Frank, House	Wichita Falls	900 Bluff Street
Morningside Historic District	Wichita Falls	Roughly bounded by 9 th St., Morningside Dr., Pembroke Lane and Buchanan St.
Perkins, Joe and Lois, House	Wichita Falls	3301 Harrison Street
Weeks House	Wichita Falls	2112 Kell Boulevard
Wichita Falls Route Building	Wichita Falls	503 8 th St.

EXISTING LAND USE AND DEVELOPMENT TRENDS

Zoning ordinance sets forth regulations and standards related to the extent of uses of land and structures that are allowed in certain areas. A zoning map shows the areas within a community where the various zoning districts and standards are located and gives an overall picture of what types of development are located in a community and how a community intends to continue to grow. The following jurisdictions have a zoning ordinance: Cities of Burkburnett, Iowa Park and Wichita Falls.

A review of building permits can also give a picture of the built environment and the number of buildings that are being constructed in the county and each jurisdiction. Table 3-9 lists the number of residential buildings and total units authorized through a permit from each jurisdiction, where data was available, between 2018 and 2022. The data includes total buildings and total units permitted. **Permits are reported annually in September and the data includes that from 2018 through 2022, demonstrating changes from year to year.** Of the residential building permits issued

¹³ National Register of Historic Places

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in this period, 95 percent were for single-family buildings and 5 percent for multi-family buildings. Housing type can also be an indication of an individual's ability to recover from a disaster.

Table 3-9. Building Permits, By Jurisdiction, 2018-2022¹⁴

JURISDICTION	2018		2019		2020		2021		2022	
	Total Buildings	Total Units	Total Buildings	Total Units	Total Buildings	Total Units	Total Buildings	Total Units	Total Buildings	Total Units
Unincorporated Wichita County ¹⁵	5	5	0	0	8	8	16	16	7	7
City of Burkburnett	19	19	10	20	22	22	33	33	8	8
City of Cashion Community*	-	-	-	-	-	-	-	-	-	-
City of Electra	-	-	-	-	-	-	1	1	-	-
City of Iowa Park	9	9	7	7	17	17	17	17	9	9
City of Pleasant Valley	-	-	-	-	-	-	1	1	-	-
City of Wichita Falls	83	223	94	128	139	148	93	93	101	312
Grand Total	116	256	111	155	186	186	161	161	125	336

*Data for jurisdiction was not included in the database

The Wichita County planning area total housing unit inventory for 2021 was 55,544 structures. The total permits issued for housing units for that same year was 161, or 0.3% of the total inventory, indicating only a minor increase in planned housing structures. Total residential permits issued decreased slightly from 2020, and again from 2021 to 2022. This limited development aligns with the slightly decreasing population trend and is a reliable indicator establishing no notable change in overall vulnerability to the planning area for the hazards addressed in this plan.

FUTURE GROWTH AND DEVELOPMENT

To better understand how future growth and development in the county might affect hazard vulnerability, it is useful to consider population growth, occupied and vacant land, the potential for future development in hazard areas, and current planning and growth management efforts. This section includes an analysis of the projected population change and economic impacts.

Population projections from 2010 to 2050 are listed in Table 3-10, as provided by the Office of the State Demographer, Texas State Data Center, and the Institute for Demographic and Socioeconomic Research. Population projections are based on a 0.5 scenario growth rate, which is 50 percent of the population growth rate that occurred during 2000-2010. This information is

¹⁴ U.S. Census Bureau, Building Permit Survey, 1992-2021, <https://www.census.gov/construction/bps/>

¹⁵ Data provided by Wichita County. All buildings assumed to be single units. Permits issued in SFHA's only as County issues clearance letter only for construction outside of SFHA. Wichita County totals include any permits issued by County for Cashion Community.

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only available at the county level. However, the population projection shows a decrease in population density for the county, which would mean overall decrease for the county.

Table 3-10. Wichita County Population Projections¹⁶

LAND AREA (SQ MI)	2010		2020		2030		2040		2050	
	Population									
	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)
628	131,500	209.4	133,138	212.0	132,328	210.7	127,916	203.7	121,675	193.8

Comprehensive Plans are guiding documents in a community that sets forth a vision, goals, policies, and guidelines to direct future physical, social, and economic development that will occur within a jurisdiction. Comprehensive Plans are part of a continuous process to provide an environment for the citizens and to consider the general desire of the community to conserve, preserve, and protect the natural environment of their jurisdiction. These plans are used to guide city staff, decision-makers, and citizens in making decisions which affect the community with the understanding of the long-term effects. The following is a summary of a sample of Comprehensive Plans participating jurisdictions in Wichita County have in place. Refer to Appendix F Capability Assessment for a complete list of participating jurisdictions with Comprehensive Plans.

The Wichita Falls plan, Vision 20/20, contains the City of Wichita Falls’ official policies on land use, transportation, housing, environment, and utilities. The plan also focuses on the local and regional economy and the economic impact of job losses at Sheppard Air Force Base due to base realignment. The plan is used by the City Council to evaluate land use changes and to make funding and budget decisions. The plan is used by city staff to regulate building and development and to make recommendations on projects. It is used by citizens to understand the city’s long-range plan and proposals for different areas in the city. The plan provides the basis for the city’s development regulations and the foundation for its capital improvements program.

¹⁶ Office of the State Demographer, Texas State Data Center, and the Institute for Demographic and Socioeconomic Research



SECTION 4

RISK OVERVIEW

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HAZARD DESCRIPTION

Section 4 is the first phase of the Risk Assessment, providing background information for the hazard identification process and descriptions for the hazards identified. The Risk Assessment continues with Sections 5 through 15, which include hazard descriptions and vulnerability assessments.

Upon a review of the full range of natural hazards suggested under FEMA planning guidance, participating jurisdictions within Wichita County identified eleven natural hazards that are addressed in the Hazard Mitigation Plan Update and were identified as significant, as shown in Table 4-1. The hazards were identified through input from Planning Team members and a review of the current 2018 State of Texas Hazard Mitigation Plan (State Plan). Readily available online information from reputable sources such as federal and state agencies were also evaluated and utilized to supplement information as needed.

In general, there are three main categories of natural hazards: atmospheric, hydrologic, and technological. Atmospheric hazards are events or incidents associated with weather-generated phenomena. The following have been identified as significant for the planning area: extreme heat, hail, lightning, thunderstorm wind, tornado, and winter storm (Table 4-1).

Hydrologic hazards are events or incidents associated with water-related damage and account for over 75 percent of federal disaster declarations in the United States. Hydrologic hazards identified as significant for the planning area include flood and drought.

Technological hazards refer to the origins of incidents that can arise from human activities, such as the construction and maintenance of dams. They are distinct from natural hazards primarily because they originate from human activity. The risks presented by natural hazards may be increased or decreased as a result of human activity, however they are not inherently human-induced. Therefore, dam failure is classified as a quasi-technological hazard and referred to as “technological” in Table 4-1 for purposes of description.

For the Risk Assessment, the earthquake and wildfire hazards are considered “other,” since these hazards are not considered atmospheric, hydrologic, nor technological.

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Table 4-1. Hazard Descriptions

HAZARD	DESCRIPTION
ATMOSPHERIC	
Extreme Heat	Extreme heat is the condition whereby temperatures hover ten degrees or more above the average high temperature in a region for an extended period of time.
Hail	Hailstorms are a potentially damaging outgrowth of severe thunderstorms. Early in the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to the rapid rising of warm air into the upper atmosphere and subsequent cooling of the air mass.
Lightning	Lightning is a sudden electrostatic discharge that occurs during an electrical storm. This discharge occurs between electrically charged regions of a cloud, between two clouds, or between a cloud and the ground.
Thunderstorm Wind	A thunderstorm occurs when an observer hears thunder. Radar observers use the intensity of the radar echo to distinguish between rain showers and thunderstorms. Lightning detection networks routinely track cloud-to-ground flashes, and therefore thunderstorms.
Tornado	A tornado is a violently rotating column of air that has contact with the ground and is often visible as a funnel cloud. Its vortex rotates cyclonically with wind speeds ranging from as low as 40 mph to as high as 300 mph. The destruction caused by tornadoes ranges from light to catastrophic, depending on the location, intensity, size, and duration of the storm.
Winter Storm	Severe winter storms may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Blizzards, the most dangerous of all winter storms, combine low temperatures, heavy snowfall, and winds of at least 35 mph, reducing visibility to only a few yards. Ice storms occur when moisture falls and freezes immediately upon impact on trees, power lines, communication towers, structures, roads, and other hard surfaces. Winter storms and ice storms can down trees, cause widespread power outages, damage property, and cause fatalities and injuries to human life.
HYDROLOGIC	
Drought	A prolonged period of less than normal precipitation such that the lack of water causes a serious hydrologic imbalance. Common effects of drought include crop failure, water supply shortages, and fish and wildlife mortality.

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HAZARD	DESCRIPTION
Flood	The accumulation of water within a body of water, which results in the overflow of excess water onto adjacent lands, usually floodplains. The floodplain is the land adjoining the channel of a river, stream, ocean, lake, or other watercourse or water body that is susceptible to flooding. Most floods fall into the following three categories: riverine flooding, coastal flooding, and shallow flooding.
OTHER	
Earthquake	An earthquake is the sudden, rapid, shaking of the earth, caused by the breaking and shifting of subterranean rock as it releases strain that has accumulated over a long time. Initial mild shaking may strengthen and become extremely violent within seconds.
Wildfire	A wildfire is an uncontrolled fire burning in an area of vegetative fuels such as grasslands, brush, or woodlands. Heavier fuels with high continuity, steep slopes, high temperatures, low humidity, low rainfall, and high winds all work to increase the risk for people and property located within wildfire hazard areas or along the urban/wildland interface. Wildfires are part of the natural management of forest ecosystems, but most are caused by human factors.
TECHNOLOGICAL	
Dam Failure	Dam failure is the collapse, breach, or other failure of a dam structure resulting in downstream flooding. In the event of a dam failure, the energy of the water stored behind even a small dam is capable of causing loss of life and severe property damage if development exists downstream of the dam.

Hazards that were not considered significant and were not included in the Plan Update are located in Table 4-2, along with the evaluation process used for determining the significance of each of these hazards. Hazards not identified for inclusion at this time may be addressed during future evaluations and updates.

Table 4-2. Other Hazards Deferred

HAZARD CONSIDERED	REASON FOR DETERMINATION
Coastal Erosion	The planning area is not located on the coast, therefore coastal erosion does not pose a risk.
Expansive Soils	There is no history of impact to critical structures, systems, populations or other community assets or vital services as a result of expansive soils and none is expected in the future.

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HAZARD CONSIDERED	REASON FOR DETERMINATION
Hurricane Wind	The planning area is not located within 200 miles of the coast; therefore, direct hurricane wind impacts do not pose a risk. Any remnants of a hurricane or tropical storm system would only include secondary impacts such as thunderstorm winds and rainfall and would be covered under thunderstorm wind or flood mitigation measures.
Land Subsidence	There are no historical occurrences of land subsidence for the planning area and it is located in an area where occurrences are considered rare. There is no history of impact to critical structures, systems, populations or other community assets or vital services as a result of land subsidence and none is expected in the future.

DISASTER DECLARATION HISTORY

One method of understanding hazards that pose a risk to Wichita County is to identify past hazard events that triggered federal or state disaster declarations. Federal and state declarations may be granted when the severity and magnitude of an event surpasses the ability of the local government to respond and recover. Disaster assistance is supplemental and sequential. Table 4-3 lists state and federal disaster declarations received by Wichita County. Many of the disaster events were regional or statewide.

Between 1953 and 2023 Wichita County received 24 disaster declarations. Out of 24 declared disasters, a majority (9) were related to wildfires, followed by declarations for severe storms (5), hurricanes (3)¹, severe ice storms (2), biological (2), flood (1), tornado (1), and drought (1).

In addition to the 24 federally declared disaster there have been 31 U.S. Department of Agriculture (USDA) Secretarial disaster designations between 2012 and 2022. The Secretary of Agriculture is authorized to designate counties as disaster areas to make emergency loans available to producers suffering losses in those counties and in counties that are contiguous to a designated county.² Of the USDA designations, 25 have been for drought, 3 for winter weather, 1 for severe weather, and 2 for excessive moisture/rainfall.

Table 4-3. Disaster Declaration History in Wichita County, 1953-2023³

YEAR	DECLARATION TITLE	HAZARD	DECLARATION TYPE	DISASTER No.
1979	Severe Storms & Tornadoes	Tornado	DR	DR-575

¹ Wichita County received federal declarations for hurricanes, however, the planning area did not receive damages as a result of the storm events. The County and the City of Wichita Falls were open for those impacted areas that required evacuation.

² United States Department of Agriculture https://www.fsa.usda.gov/Assets/USDA-FSA-Public/usdafiles/FactSheets/emergency_disaster_designation_declaration_process-factsheet.pdf

³ Data available up to August 31, 2023: <https://www.fema.gov/data-visualization/disaster-declarations-states-and-counties>

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YEAR	DECLARATION TITLE	HAZARD	DECLARATION TYPE	DISASTER No.
1982	Severe Storms & Flooding	Flood	DR	DR-659
1989	Severe Storms Tornadoes & Flooding	Severe Storm	DR	DR-828
1990	Severe Storms Tornadoes & Flooding	Severe Storm	DR	DR-863
1993	Extreme Fire Hazard	Drought	EM	EM-3113
1996	Extreme Fire Hazard	Fire	EM	EM-3117
1998	Tropical Storm Charley	Severe Storm	DR	DR-1239
1999	Extreme Fire Hazards	Fire	EM	EM-3142
2005	Hurricane Katrina Evacuation	Hurricane	EM	EM-3216
2005	Hurricane Rita	Hurricane	EM	EM-3261
2005	Hurricane Rita	Hurricane	DR	DR-1606
2006	Extreme Wildfire Threat	Fire	DR	DR-1624
2007	Severe Storms, Tornadoes, & Flooding	Severe Storm	DR	DR-1709
2008	Wildfires	Fire	EM	EM-3284
2009	Electra West Fire	Fire	FM	FM-2805
2011	Wichita Fire Complex	Fire	FM	FM-2891
2011	Sisk Road Fire	Fire	FM	FM-2905
2011	Wildfires	Fire	DR	DR-1999
2015	Severe Storms, Tornadoes, Straight-line Winds, & Flooding	Severe Storm	DR	DR-4223
2020	COVID-19	Biological	EM	EM-3458
2020	COVID-19 Pandemic	Biological	DR	DR-4485
2021	Severe Winter Storm	Severe Ice Storm	EM	EM-3554
2021	Severe Winter Storms	Severe Ice Storm	DR	DR-4586
2022	County Line Fire	Fire	FM	FM-5420

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NATURAL HAZARDS AND CLIMATE CHANGE

Climate change is defined as a long-term shift in temperature and weather patterns. These shifts can increase or decrease the risk of natural hazards. Global climate change is expected to exacerbate the risks of certain types of natural hazards impacted through rising sea levels, warmer ocean temperatures, higher humidity, the possibility of stronger storms, and an increase in wind and flood damages due to storm surges. Texas is considered one of the more vulnerable states in the U.S. to both abrupt climate changes and to the impact of gradual climate changes to the natural and built environments.

Climate change is expected to lead to an increase in average temperatures as well as an increase in frequency, duration, and intensity of extreme heat events. With no reductions in emissions worldwide, the state of Texas is projected to experience an additional 30 to 60 days per year above 100°F than what is experienced now.⁴

The State Climatologist's *Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036* identifies ongoing and likely future trends out to the year 2036 based on analysis of historic observations of temperatures, precipitation, and extreme weather. Table 4-4 highlights future trends in extreme weather from the report.

Table 4-4. Future Trends in Extreme Weather in Texas⁵

HAZARDS	EXPECTED TRENDS
Extreme Temperatures	<ul style="list-style-type: none">• The average annual surface temperature in 2036 is expected to be 3.0°F warmer than the 1950-1999 average and 1.8°F warmer than the 1991-2020 average.• Nearly double the number of 100°F days by 2036 compared to 2001-2020.• Higher frequency of 100°F days in urban areas.• Extreme monthly summertime temperature trends imply an increase of about 1°F compared to the 1950-1999 average.• Extreme monthly wintertime temperatures are expected to continue to increase at an even faster rate.• The coolest days of the summer are expected to continue becoming warmer.
Precipitation	<ul style="list-style-type: none">• Precipitation has increased by 10 percent or more in eastern Texas, but little trend is present in western Texas.• Precipitation trends to 2036 are likely to be dominated by natural variability.• Extreme precipitation is expected to increase in intensity on average statewide by 6-10 percent compared to the 1950-

⁴ Kloesel, K., B. Bartush, J. Banner, D. Brown, J. Lemery, X. Lin, C. Loeffler, G. McManus, E. Mullens, J. Nielsen-Gammon, M. Shafer, C. Sorensen, S. Sperry, D. Wildcat, and J. Ziolkowska, 2018: Southern Great Plains. In Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 987–1035. doi: 10.7930/NCA4.2018.CH23. <https://nca2018.globalchange.gov/chapter/23/>

⁵ Nielson-Gammon, John, Holman, Sara, Buley, Austin and Jorgensen, Savannah. Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, 2021 Update. Texas A&M University Office of the Texas State Climatologist. October 7, 2021. <https://climatexas.tamu.edu/files/ClimateReport-1900to2036-2021Update>

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HAZARDS	EXPECTED TRENDS
	<p>1999 averages and 2-3 percent relative to the 2001-2020 averages.</p> <ul style="list-style-type: none">• This translates to an increase in the frequency of extreme rain of 30-50 percent relative to the climatological expected frequency in 1950-1999 and 10-15 percent relative to 2001-2020.
Drought	<ul style="list-style-type: none">• Increasing temperatures, rainfall variability, and other factors will on balance decrease water availability, but impact changes will vary strongly across applications.• Impact trends to be highly sector-specific, with the impacts possibly smaller for agriculture than for surface water supply.
Flood	<ul style="list-style-type: none">• No long-term river flooding trend has been identified in the observations, nor is such a trend projected at this point, except perhaps for the most extreme floods and areas with normally high rainfall.• Urban flooding is projected to increase, both as a simple matter of urban population increase and because of the projected increase of precipitation intensity, which drives flooding in fast-response drainages like those usually found in urban areas.• The climate-driven trend in urban flood frequency should be similar to the climate-driven trend in extreme precipitation frequency: 30-50 percent in 2036 relative to 1950-1999 and 10-15 percent relative to 2001-2020.
Winter Weather	<ul style="list-style-type: none">• As the climate warms, the likelihood of winter weather decreases.• Both extreme cold and snowfall either become less frequent or are expected to do so.• Widespread snowfall events in Texas such as the one that took place in February 2021 are extremely rare.
Thunderstorms (Wind, Hail, Lightning)	<ul style="list-style-type: none">• Historical trend data is unreliable.• Indirect evidence supports an increase in the number of days capable of producing severe thunderstorms and an increase in the frequency of very large hail in early springtime, but these possible trends are too uncertain to quantify.
Wildfire	<ul style="list-style-type: none">• Weather and climate drivers of wildfire risk are projected to increase the risk of wildfires throughout the state, primarily due to increased rates of drying and increased fuel load.

OVERVIEW OF HAZARD ANALYSIS

The methodologies utilized to develop the Risk Assessment are a historical analysis and a statistical approach. Both methodologies provide an estimate of potential impact by using a common, systematic framework for evaluation.

Records retrieved from National Centers for Environmental Information (NCEI) and National Oceanic and Atmospheric Administration (NOAA) were reported for participating jurisdictions

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within Wichita County. Remaining records identifying the occurrence of hazard events in the planning area and the maximum recorded magnitude of each event were also evaluated.

The use of geographic information system (GIS) technology to identify and assess risks for Wichita County and evaluate community assets and their vulnerability to the hazards.

The four general parameters that are described for each hazard in the Risk Assessment include frequency of return, approximate annualized losses, a description of general vulnerability, and a statement of the hazard's impact.

Frequency of return was calculated by dividing the number of events in the recorded time period for each hazard by the overall time period that the resource database was recording events. Frequency of return statements are defined in Table 4-5, and impact statements are defined in Table 4-6 below.

Table 4-5. Frequency of Return Statements

PROBABILITY	DESCRIPTION
Highly Likely	Event is probable in the next year.
Likely	Event is probable in the next three years.
Occasional	Event is probable in the next five years.
Unlikely	Event is probable in the next ten years.

Table 4-6. Impact Statements

POTENTIAL SEVERITY	DESCRIPTION
Substantial	Multiple deaths. Complete shutdown of facilities for 30 days or more. More than 50 percent of property destroyed or with major damage.
Major	Injuries and illnesses resulting in permanent disability. Complete shutdown of critical facilities for at least two weeks. More than 25 percent of property destroyed or with major damage.
Minor	Injuries and illnesses do not result in permanent disability. Complete shutdown of critical facilities for more than one week. More than 10 percent of property destroyed or with major damage.
Limited	Injuries and 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.

Each of the hazard profiles includes a description of a general Vulnerability Assessment. Vulnerability is the total of assets that are subject to damages from a hazard, based on historic recorded damages. Assets in the region were inventoried and defined in hazard zones where

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appropriate. The total amount of damages, including property and crop damages, for each hazard is divided by the total number of assets (building value totals) in that community to determine the percentage of damage that each hazard can cause to the community. Risk and consequences will be addressed and covered within each hazard profile under the Vulnerability and Impact section as well as under the Assessment of Impact sections, where applicable.

To better understand how future growth and development in the Wichita County region might affect hazard vulnerability, it is useful to consider population growth, occupied and vacant land, the potential for future development in hazard areas, and current planning and growth management efforts. Hazard vulnerability for all participating jurisdictions within Wichita County was reviewed based on recent development changes that occurred throughout the planning area. The population of Wichita County has decreased by 2 percent between 2010 and 2020, according to the U.S. Census Bureau, therefore the vulnerability to the population, infrastructure, and buildings has remained essentially unchanged for hazards addressed in the plan.

Once loss estimates and vulnerability were known, an impact statement was applied to relate the potential impact of the hazard on the assets within the area of impact.

HAZARD RANKING

During the 2023 planning process, the Planning Team conducted a risk ranking exercise to get input from the Planning Team and stakeholders. Table 4-7 portrays the results of the risk assessment analysis including the frequency of occurrence and potential severity and the Planning Team's self-assessment for hazard ranking, based on local knowledge of past hazard events and impacts for each of the identified hazards. The definitions for frequency of occurrence and potential severity can be found in Table 4-5 and Table 4-6.

Table 4-7. Hazard Risk Ranking

HAZARD	FREQUENCY OF OCCURENCE	POTENTIAL SEVERITY	RANKING
Drought	Highly Likely	Limited	High
Extreme Heat	Highly Likely	Substantial	High
Flood	Highly Likely	Limited	High
Hail	Highly Likely	Limited	High
Lightning	Highly Likely	Limited	High
Thunderstorm Wind	Highly Likely	Major	High
Tornado	Highly Likely	Substantial	High
Wildfire	Highly Likely	Limited	High
Winter Storm	Highly Likely	Limited	Moderate
Dam Failure	Unlikely	Limited	Moderate
Earthquake	Unlikely	Limited	Low



SECTION 5 DROUGHT

SECTION 5: DROUGHT

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HAZARD DESCRIPTION

Drought is a period of time without substantial rainfall that persists from one year to the next. Drought is a normal part of virtually all climatic regions, including areas with high and low average rainfall. Drought is the consequence of anticipated natural precipitation reduction over an extended period of time, usually a season or more in length. Droughts can be classified as meteorological, hydrologic, agricultural, and socioeconomic. Table 5-1 presents definitions for these different types of droughts.



Droughts are one of the most complex of all natural hazards as it is difficult to determine their precise beginning or end. In addition, droughts can lead to other hazards such as extreme heat and wildfires. Their impact on wildlife and area farming is enormous, often killing crops, grazing land, edible plants, and even in severe cases, trees. A secondary hazard to drought is wildfire because dying vegetation serves as a prime ignition source. Therefore, a heat wave combined with a drought is a very dangerous situation.

Table 5-1. Drought Classification Definitions¹

METEOROLOGICAL DROUGHT	The degree of dryness or departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales.
HYDROLOGIC DROUGHT	The effects of precipitation shortfalls on stream flows and reservoir, lake, and groundwater levels.
AGRICULTURAL DROUGHT	Soil moisture deficiencies relative to water demands of plant life, usually crops.
SOCIOECONOMIC DROUGHT	The effect of demands for water exceeding the supply as a result of a weather-related supply shortfall.

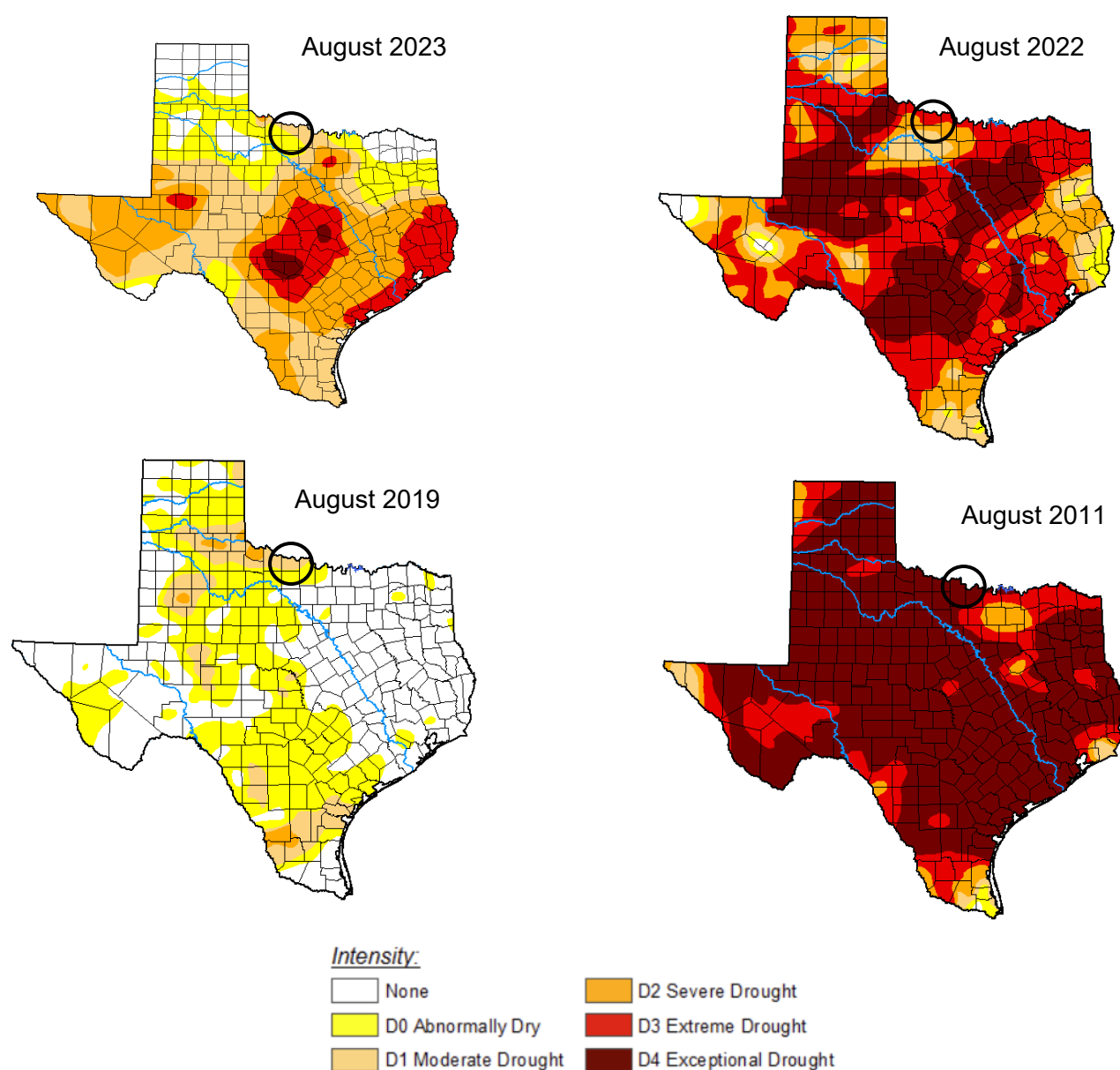
¹ Multi-Hazard Identification and Risk Assessment: A Cornerstone of the National Mitigation Strategy, FEMA

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LOCATION

Droughts occur regularly throughout Texas and the Wichita County planning area, including participating jurisdictions, and are considered a normal condition. However, they can vary greatly in their intensity and duration. The U.S. Drought Monitor, produced through a partnership between the National Drought Mitigation Center at the University of Nebraska-Lincoln, U.S. Department of Agriculture and the National Oceanic and Atmospheric Administration, shows the planning area is currently experiencing abnormally dry and moderate drought conditions and has historically experienced a range of conditions from abnormally dry to exceptional drought conditions over the last decade. There is no distinct geographic boundary to drought; therefore, it can occur throughout the Wichita County planning area equally.

Figure 5-1. U.S. Drought Monitor, August 2011, August 2019, August 2022, August 2023



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EXTENT

The Palmer Drought Index is used to measure the extent of drought by measuring the duration and intensity of long-term drought-inducing circulation patterns. Long-term drought is cumulative, with the intensity of drought during the current month dependent upon the current weather patterns plus the cumulative patterns of previous months. The hydrological impacts of drought (e.g., reservoir levels, groundwater levels, etc.) take longer to develop. Table 5-2 depicts magnitude of drought, while Table 5-3 describes the classification descriptions.

Table 5-2. Palmer Drought Index

DROUGHT INDEX	DROUGHT CONDITION CLASSIFICATIONS						
	Extreme	Severe	Moderate	Normal	Moderately Moist	Very Moist	Extremely Moist
Z Index	-2.75 and below	-2.00 to -2.74	-1.25 to -1.99	-1.24 to +.99	+1.00 to +2.49	+2.50 to +3.49	n/a
Meteorological	-4.00 and below	-3.00 to -3.99	-2.00 to -2.99	-1.99 to +1.99	+2.00 to +2.99	+3.00 to +3.99	+4.00 and above
Hydrological	-4.00 and below	-3.00 to -3.99	-2.00 to -2.99	-1.99 to +1.99	+2.00 to +2.99	+3.00 to +3.99	+4.00 and above

Table 5-3. Palmer Drought Category Descriptions²

CATEGORY	DESCRIPTION	POSSIBLE IMPACTS	PALMER DROUGHT INDEX
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures; fire risk above average. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered.	-1.0 to -1.9
D1	Moderate Drought	Some damage to crops, pastures; fire risk high; streams, reservoirs, or wells low, some water shortages developing or imminent, voluntary water use restrictions requested.	-2.0 to -2.9
D2	Severe Drought	Crop or pasture losses likely; fire risk very high; water shortages common; water restrictions imposed.	-3.0 to -3.9
D3	Extreme Drought	Major crop/pasture losses; extreme fire danger; widespread water shortages or restrictions.	-4.0 to -4.9
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; exceptional fire risk; shortages of water in reservoirs, streams, and wells, creating water emergencies.	-5.0 or less

² Source: National Drought Mitigation Center

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Drought is monitored nationwide by the National Drought Mitigation Center (NDMC). Indicators are used to describe broad scale drought conditions across the U.S. and correspond to the intensity of drought.

Based on the historical occurrences for drought, the Wichita County planning area, including participating jurisdictions, can anticipate a range of drought from abnormally dry to exceptional, or D0 to D4, based on the Palmer Drought Category. The entire planning area has experienced exceptional drought conditions. This is the most extreme drought conditions the planning area can anticipate in the future based on historical events.

The County monitors drought conditions regularly and follows conservation measures outlined in the Wichita Falls Drought Contingency Plan. The County and the participating jurisdictions initiate protocols during periods of higher-than-normal temperatures and lower than normal rainfall. Table 5-4 reflects an outline of the Wichita Falls Drought Contingency Plan.

Table 5-4. Wichita Falls Drought Contingency Plan

STAGE	DESCRIPTION
Permanent “Year-Round” Restrictions	Water conservation measures effects at all times and it shall be unlawful for any person, firm corporation, or other entities, at any time of the year, to: irrigate, car wash, consumer drinking water, ice machines, lodging, as reflective within the ordinance.
Discretionary Drought Restrictions	Director of Public Works may declare any stage of drought restrictions described in this ordinance to be effective if: system demand exceeds 90% design treatment capacity for 3 or more consecutive days; water support systems is unable to deliver water due to mechanical failure or damage of major water system components which are expected to require more than 72 hours to repair, or the water system is contaminated either accidentally or intentionally , or the water system fails from acts of nature or man.
Stage 1: “Drought Watch”	When the levels at Lake Arrowhead and Kickapoo reach a combined capacity of 65%, with the goal of reducing the amount of water being used by 5%. Actions will be specific to mandating restrictions on non-essential uses of water and essential uses of water within irrigation, car washing, car dealers/fleets, consumer drinking at restaurants, bar, etc.
Stage 2: “Drought Warning”	When the levels at Lake Arrowhead and Kickapoo reach a combined capacity of 50%, with the goal of reducing the amount of water being used by 15%. Actions will be specific to mandating restrictions on non-essential uses of water and essential uses of water within irrigation, car washing, car dealers/fleets, consumer drinking at restaurants, bar, etc.
Stage 3: “Drought Emergency”	When the levels at Lake Arrowhead and Kickapoo reach a combined capacity of 40%, with the goal of reducing the amount of water being used by 35%. Actions will be specific to mandating restrictions on non-essential uses of water and essential uses of water within irrigation, car washing, car dealers/fleets, consumer drinking at restaurants, bar, etc.

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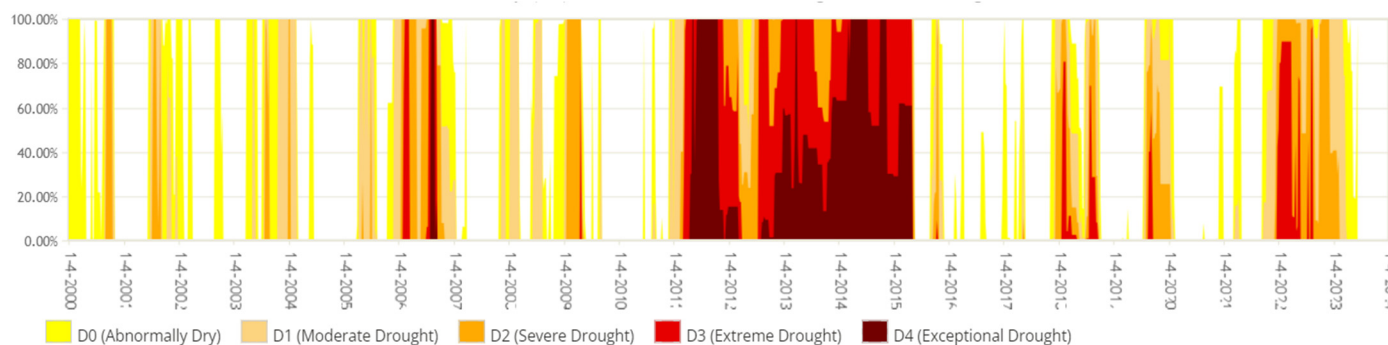
STAGE	DESCRIPTION
Stage 4: “Drought Disaster”	When the levels at Lake Arrowhead and Kickapoo reach a combined capacity of 30%, with the goal of reducing the amount of water being used by 45%. Actions will be specific to mandating restrictions on non-essential uses of water and essential uses of water within irrigation, car washing, car dealers/fleets, consumer drinking at restaurants, bar, etc.
Stage 5: “Drought Catastrophe”	When the levels at Lake Arrowhead and Kickapoo reach a combined capacity of 25%, with the goal of reducing the amount of potable water being provided by the City to less than 14 MGD. Actions will be specific to mandating restrictions on non-essential uses of water and essential uses of water within irrigation, car washing, car dealers/fleets, consumer drinking at restaurants, bar, etc.

HISTORICAL OCCURRENCES

The National Centers for Environmental Information (NCEI) Storm Events database is a national data source organized under the National Oceanic and Atmospheric Administration. The NCEI is the largest archive available for historic storm events data; however, it is important to note that only incidents recorded in the NCEI have been factored into this risk assessment unless otherwise noted. It is likely that a high number of occurrences have gone unreported during the reporting period.

The Wichita County planning area, including participating jurisdictions, may experience a severe drought in any given year. According to the U.S. Drought Monitor, in the 1,225 weeks between January 1, 2000, and June 30, 2023, the Wichita County planning area spent 616 weeks (slightly more than 50 percent of the time) in some level of drought as defined as Abnormally Dry (D0) or worse conditions. There have been 25 USDA Disaster Designations for drought between 2012 and 2022.

Figure 5-2. Wichita County Drought Intensity, January 2000 - June 2023³



Historical drought information shows drought activity across a multi-county forecast area for each event, the appropriate percentage of the total property and crop damage reported for the entire

³ U.S. Drought Monitor

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forecast area has been allocated to each county impacted by the event. Historical drought data for are provided on a county-wide basis per the NCEI Storm Events database.

Table 5-5 lists historical events that have occurred in Wichita County as reported in the NCEI Database. A total of 95 reported historical drought events, with 11 unique drought periods that have impacted Wichita County from January 1996 through June 2023. Historical drought events reported in the NCEI database for the Wichita County planning area, including all participating jurisdictions, over the 27.5-year reporting period has resulted in negligible property and crop damages.

Table 5-5. Historical Drought Years⁴

DROUGHT YEAR
2000
2001
2005-2006
2006
2009
2011-2015
2017-2018
2018
2019
2019-2020
2021-2022
11 unique events

Table 5-6. Historical Drought Events, 1996-2023

DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Wichita County	8/1/2000	0	0	\$0
Wichita County	7/4/2001	0	0	\$0
Wichita County	12/1/2005	0	0	\$0
Wichita County	1/1/2006	0	0	\$0
Wichita County	2/1/2006	0	0	\$0

⁴ Historical data is reported from January 1996 through June 2023.

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DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Wichita County	3/1/2006	0	0	\$0
Wichita County	4/1/2006	0	0	\$0
Wichita County	5/1/2006	0	0	\$0
Wichita County	8/1/2006	0	0	\$0
Wichita County	9/1/2006	0	0	\$0
Wichita County	2/1/2009	0	0	\$0
Wichita County	3/1/2009	0	0	\$0
Wichita County	4/1/2009	0	0	\$0
Wichita County	5/1/2009	0	0	\$0
Wichita County	2/22/2011	0	0	\$0
Wichita County	3/1/2011	0	0	\$0
Wichita County	4/1/2011	0	0	\$0
Wichita County	5/1/2011	0	0	\$0
Wichita County	6/1/2011	0	0	\$0
Wichita County	7/1/2011	0	0	\$0
Wichita County	8/1/2011	0	0	\$0
Wichita County	9/1/2011	0	0	\$0
Wichita County	10/1/2011	0	0	\$0
Wichita County	11/1/2011	0	0	\$0
Wichita County	12/1/2011	0	0	\$0
Wichita County	1/1/2012	0	0	\$0
Wichita County	2/1/2012	0	0	\$0
Wichita County	3/1/2012	0	0	\$0
Wichita County	5/1/2012	0	0	\$0
Wichita County	6/1/2012	0	0	\$0
Wichita County	7/1/2012	0	0	\$0
Wichita County	8/1/2012	0	0	\$0

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DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Wichita County	9/1/2012	0	0	\$0
Wichita County	10/1/2012	0	0	\$0
Wichita County	11/1/2012	0	0	\$0
Wichita County	12/1/2012	0	0	\$0
Wichita County	1/1/2013	0	0	\$0
Wichita County	2/1/2013	0	0	\$0
Wichita County	3/1/2013	0	0	\$0
Wichita County	4/1/2013	0	0	\$0
Wichita County	5/1/2013	0	0	\$0
Wichita County	6/1/2013	0	0	\$0
Wichita County	7/1/2013	0	0	\$0
Wichita County	8/1/2013	0	0	\$0
Wichita County	9/1/2013	0	0	\$0
Wichita County	10/1/2013	0	0	\$0
Wichita County	11/1/2013	0	0	\$0
Wichita County	12/1/2013	0	0	\$0
Wichita County	1/1/2014	0	0	\$0
Wichita County	2/1/2014	0	0	\$0
Wichita County	3/1/2014	0	0	\$0
Wichita County	4/1/2014	0	0	\$0
Wichita County	5/1/2014	0	0	\$0
Wichita County	6/1/2014	0	0	\$0
Wichita County	7/1/2014	0	0	\$0
Wichita County	8/1/2014	0	0	\$0
Wichita County	9/1/2014	0	0	\$0
Wichita County	10/1/2014	0	0	\$0
Wichita County	11/1/2014	0	0	\$0

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DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Wichita County	12/1/2014	0	0	\$0
Wichita County	1/1/2015	0	0	\$0
Wichita County	2/1/2015	0	0	\$0
Wichita County	3/1/2015	0	0	\$0
Wichita County	4/1/2015	0	0	\$0
Wichita County	5/1/2015	0	0	\$0
Wichita County	9/15/2015	0	0	\$0
Wichita County	10/1/2015	0	0	\$0
Wichita County	12/1/2017	0	0	\$0
Wichita County	1/1/2018	0	0	\$0
Wichita County	2/1/2018	0	0	\$0
Wichita County	3/1/2018	0	0	\$0
Wichita County	4/1/2018	0	0	\$0
Wichita County	5/1/2018	0	0	\$0
Wichita County	7/1/2018	0	0	\$0
Wichita County	8/1/2018	0	0	\$0
Wichita County	9/1/2018	0	0	\$0
Wichita County	8/1/2019	0	0	\$0
Wichita County	9/1/2019	0	0	\$0
Wichita County	10/1/2019	0	0	\$0
Wichita County	12/1/2019	0	0	\$0
Wichita County	1/1/2020	0	0	\$0
Wichita County	12/16/2021	0	0	\$0
Wichita County	1/1/2022	0	0	\$0
Wichita County	2/1/2022	0	0	\$0
Wichita County	3/1/2022	0	0	\$0
Wichita County	4/1/2022	0	0	\$0

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DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Wichita County	5/1/2022	0	0	\$0
Wichita County	6/1/2022	0	0	\$0
Wichita County	6/15/2022	0	0	\$0
Wichita County	7/1/2022	0	0	\$0
Wichita County	8/1/2022	0	0	\$0
Wichita County	8/1/2022	0	0	\$0
Wichita County	10/1/2022	0	0	\$0
Total	0	0	\$0	\$0

Table 5-7. Historical Drought Events Summary, 1996-2023

JURISDICTION	NUMBER OF EVENTS	DEATH	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Wichita County	95	0	0	\$0	\$0

Based on the list of historical drought events for the Wichita County planning area, 3 unique events were reported to the NCEI since the 2018 plan.

SIGNIFICANT EVENTS

December 2021 through December 2022 – Wichita County

Drought was extensive across much of western Oklahoma and western north Texas during the beginning of December. Conditions continued to worsen through the month of January as meaningful precipitation continued to evade north Texas. Nearly the entire county warning area was in at least severe drought by month's end, with 65 percent of the area in extreme drought. Reports continued to indicate through each consecutive month persistent drought conditions with conditions lightening in May through the beginning of June due to a round of rainfall; however, in July, hot and dry conditions allowed for drought to persist and intensify throughout all of western north Texas. By December of 2022 reports indicating that severe to exceptional drought conditions began to improve toward the middle of the month, as beneficial rainfall occurred over much of the area.

February 2011 through May 2015 – Wichita County

The 2011 drought marked the beginning of a now historic drought in Texas and the City of Wichita Falls in particular. The City of Wichita Falls saw 100 days over 100 degrees, compared to a normal yearly average of 28 days of 100 degree weather. The Weather Channel declared the City of Wichita Falls as having the “worst summer anywhere in the US”. The city only measured 13 inches of rainfall for the entire year, less than half of the average annual rainfall. There was only a modest improvement after 2011 with 19 inches of rainfall recorded in 2012, and 23 inches of rainfall recorded in 2013 and 2014. Drought conditions improved during the spring of 2015 with normal

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conditions recorded by the middle of May 2015. It is noted that 2011 and 2012 were the first two consecutive years below 20 inches of rainfall in 114 years.

Fire weather was a major concern across the state, with thousands of acres burning during the drought due to extreme dry conditions. Agriculture suffered the greatest losses due to the drought with a staggering \$7.62 billion in agricultural losses across the state in 2011 alone. Summer and fall crops, hay forages, and alfalfa were hit hard by the lack of any significant precipitation, adding further risk to livestock as pond water levels decreased or dried up altogether. Much of the wheat crop planted in the fall had all but been declared a total loss as the water level in irrigation reservoirs used for crops became unavailable as well. In Wichita County, burn bans were enacted during this extended drought period.

PROBABILITY OF FUTURE EVENTS

Based on available records of historic events, there have been 11 extended time periods of drought within a 27.5-year reporting period. The probability of future events is considered “Highly Likely” or an event probable in the next year or two for the Wichita County planning area, including all participating jurisdictions. See additional information on climate change at the end of this section as it relates to future events.

VULNERABILITY AND IMPACT

Loss estimates were based on 27.5 years of statistical data from the NCEI. A drought event frequency-impact was then developed to determine an impact profile on agriculture products and estimate potential losses due to drought in the area. All existing and future buildings, facilities, and populations are exposed to this hazard and could potentially be impacted. However, drought impacts are mostly experienced in water shortages or crop and livestock losses on agricultural lands and typically have minimal impact on buildings.

The Wichita County Planning Team identified the following critical facilities as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by drought events. The following critical facilities would be vulnerable to drought events in the Wichita County planning area, including participating jurisdictions. For a comprehensive list by participating jurisdiction please see Appendix C.

Table 5-7. Critical Facilities Vulnerable to Drought Events

CRITICAL FACILITIES	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS, Hospitals)	<ul style="list-style-type: none">Increased law enforcement activities may be required to enforce water restrictions.Firefighters may have limited water resources to aid in firefighting and suppression activities, increasing risk to lives and property.Potential for increased number of emergency calls as drought events can lead to cascading hazard events such as wildfires and flash flooding.Decreased water quality may increase incidents of illness and disease, impacting hospitals and medical facilities.

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CRITICAL FACILITIES	POTENTIAL IMPACTS
Airport, Academic Institutions, Evacuation Centers & Shelters, Governmental Facilities	<ul style="list-style-type: none"> Strain on staff as drought may cause health problems related to low water flows and poor water quality. Operations dependent on water supply may be adversely impacted.
Utility Services and Infrastructure (electric, water, wastewater, communications)	<ul style="list-style-type: none"> Potential for increased number of emergency calls as drought events can lead to cascading hazard events such as wildfires and flash flooding. Operations dependent on water supply may be adversely impacted. Private drinking wells may dry up, leaving residents without potable water.

Wichita County monitors drought conditions regularly and follows the water conservation measures outlined in the Wichita Falls Drought Contingency Plan. The City of Wichita Falls is the largest jurisdiction in a radius of about 100 miles, with the closer communities economically and culturally tied to the City of Wichita Falls. The purpose of the plan is to protect and preserve public health, welfare, and safety, maintain supplies for domestic water use, sanitation, and fire protection, minimize the adverse impacts of water supply shortages, conserve available water supply in times of emergency, and minimize the impacts of emergency water supply conditions.

Local lakes and rivers supply surface water resources for the Wichita County planning area. The planning area, specifically the City of Wichita Falls, is located in the drainage basin of the Red River and uses the watershed of the Big Wichita and Little Wichita Rivers as the primary sources of water for the area. Lake Wichita was built in 1901 and was the principal source of drinking water; however, presently the lake is used for recreational purposes and flood control.

Lakes Kemp and Diversion are jointly owned by Wichita County Water Improvement District #2 and the City of Wichita Falls. These lakes are located on the Wichita River watershed which has very high chlorides, sulfates, and suspended solids. This is used as a supplemental water source. Lake Kemp was completed in 1923 and reconstructed for flood control purposes in 1973. The storage capacity for Lake Kemp is 245,434-acre feet (according to the Texas Water Development Board), and an estimated safe yield of 70,000-acre feet per year or 62.5 million gallons per day. The City of Wichita Falls has an annual municipal water right of 31,000-acre feet for Lake Kemp. Lake Diversion was completed in 1924 having a storage capacity of 45,000-acre feet, with its primary principal purpose is to raise the elevation of the water to allow the water to flow into a series of irrigation canals between the Diversion dam site and east of the City of Wichita Falls, a distance of about 35 miles.

Additionally, Lake Arrowhead and Kickapoo provide a drinking water supply for the City of Wichita Falls and several local towns and communities. The two lakes are on the Little Wichita River watershed and offer a reliable, high-quality source of water. Lake Arrowhead has a storage capacity of 235,997-acre feet and Lake Kickapoo has a storage capacity of 85,825-acre feet.

With the planning area relying on one primary water resource, high demand can deplete these resources during extreme drought conditions. Potable water is used for drinking, sanitation,

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patient care, sterilization, equipment, heating and cooling systems, and many other essential functions in medical facilities. As resources are depleted, potable water is in short supply and overall water quality can suffer, elevating health concerns for all residents but especially vulnerable populations – typically children, the elderly, and the ill. In addition, potable water is used for drinking, sanitation, patient care, sterilization, equipment, heating and cooling systems, and many other essential functions in medical facilities.

The average person will survive only a few days without potable water, and this timeframe can be drastically shortened for those people with more fragile health – typically children, the elderly, and the ill. Population over 65 in the Wichita County planning area, including participating jurisdictions, is estimated at 14.6 percent of the total population, and children under the age of 5 are estimated at 6.3 percent for an estimated combined total of 27,060 potentially vulnerable residents in the planning area based on age. During summer drought, or hot and dry conditions, elderly persons, small children, infants and the chronically ill who do not have adequate cooling units in their homes may become more vulnerable to injury and/or death. In addition, an estimated 16.6 percent of the planning area's population live below the poverty level which may contribute to overall health impacts of a drought (Table 5-8).

Table 5-8. Population at Greater Risk by Participating Jurisdiction

JURISDICTION	POPULATION 65 AND OLDER	POPULATION UNDER 5	POPULATION BELOW POVERTY LEVEL
Wichita County	18,932	8,128	21,484
City of Burkburnett	2,190	716	1,063
City of Cashion Community	52	14	9
City of Electra	469	126	497
City of Iowa Park	1,184	779	524
City of Pleasant Valley	67	20	25
City of Wichita Falls	13,675	6,217	18,974

The population is also vulnerable to food shortages when drought conditions exist, and potable water is in short supply. All residents in the Wichita County planning area, including participating jurisdiction, could be adversely affected by drought conditions, which could limit water supplies and present health threats.

The economic impact of droughts can be significant as they produce a complex web of impacts that spans many sectors of the economy and reach well beyond the area experiencing physical drought. This complexity exists because water is integral to our ability to produce goods and provide services. If droughts extend over a number of years, the direct and indirect economic impact can be significant.

Crop production can also suffer greatly during extreme drought conditions, limiting fresh local food supplies, driving up costs, and negatively impacting the local economy. Drought conditions could adversely affect the agricultural industry throughout the Wichita County planning area, including

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participating jurisdictions, which employ 2.5 percent of the population in the labor force in Wichita County. Based on the USDA 2017 Census of Agriculture, Wichita County's total crop inventory consists of grains, cotton, canola and forage (hay/haylage), with wheat for grain being the top crops in acres (55,806). The livestock industry within the County consists of cattle, goats, hogs/pigs, horses, layers, pullets, sheep and turkey, with cattle having the largest inventory within the area (39,811). Table 5-9 provides an overview for the planning area.

Table 5-9. Wichita County 2017 Census of Agriculture⁵

JURISDICTION	NUMBER OF FARMS	LAND IN FARM (ACRES)	TOTAL CROPS	TOTAL LIVESTOCK INVENTORY	TOTAL AG PRODUCT SOLD
Wichita County	614	370,302	14,627	19,138	\$33,765,000

Habitat damage is a potential impact to the environment during periods of drought for both aquatic and terrestrial species. The environment also becomes vulnerable during periods of extreme or prolonged drought due to severe erosion and land degradation.

Impacts of past droughts experienced in the Wichita County planning area, including all participating jurisdiction, have not resulted in injuries or fatalities supporting a "Limited" severity of impact meaning injuries and/or illnesses are treatable with first aid, shutdown of facilities and services for less than 24 hours, and less than 10 percent of property is destroyed or with major damage. The annualized estimated losses due to drought over the 27.5-year reporting period in the Wichita County planning area is considered negligible. Table 5-10 shows annualized exposure.

Table 5-10. Estimated Annualized Losses for Wichita County

JURISDICTION	TOTAL PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Wichita County	\$0	\$0

ASSESSMENT OF IMPACTS

The Drought Impact Reporter was developed in 2005 by the University of Nebraska-Lincoln to provide a national database of drought impacts. Droughts can have an impact on agriculture, business and industry; energy; fire; plants and wildlife; relief, response, and restrictions; society and public health; tourism and recreation; and water supply and quality. The reports are submitted by individuals to Federal, State, and local agencies, as well as the general public. Table 5-11 lists the drought impacts to the Wichita County planning area, including participating jurisdictions, from 2005 to 2022 based on reports received by the Drought Impact Reporter.

⁵ United States Department of Agriculture. 2017 State and County Profiles | 2017 Census of Agriculture | USDA/NASS. (n.d.).
https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/index.php

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Table 5-11. Drought Impacts, 2005-2022⁶

DROUGHT IMPACTS 2005-2022	
Agriculture	98
Business & Industry	1
Energy	1
Fire	28
Plants & Wildlife	56
Relief, Response & Restrictions	32
Society & Public Health	10
Tourism & Recreation	4
Water Supply & Quality	29

Drought has the potential to impact people in the Wichita County planning area, including participating jurisdictions. While it is rare that drought, in and of itself, leads to a direct risk to the health and safety of people in the U.S., severe water shortages could result in inadequate supply for human needs. Severe drought conditions can be frequently associated with a variety of impacts, including:

- The number of health-related low-flow issues (e.g., diminished sewage flows, increased pollution concentrations, reduced firefighting capacity, and cross-connection contamination) will increase as the drought intensifies.
- Public safety from grassland / range / wildfires will increase as water availability and/or pressure decreases.
- Respiratory ailments may increase as the air quality decreases.
- There may be an increase in disease due to wildlife concentrations (e.g., rabies, Rocky Mountain spotted fever, Lyme disease).
- Residents may disagree with the County and jurisdictions over water use / water rights, creating conflict.
- Political conflicts may increase between municipalities, counties, states, and regions.
- Water management conflicts may arise between competing interests.
- Increased law enforcement activities may be required to enforce water restrictions.
- Severe water shortages could result in inadequate supply for human needs as well as lower quality of water for consumption.
- Firefighters may have limited water resources to aid in firefighting and suppression activities, increasing risk to lives and property.
- During drought there is an increased risk for wildfires and dust storms.
- The community may need increased operational costs to enforce water restriction or rationing.

⁶ Drought Impact Reporter

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- Prolonged drought can lead to increases in illness and disease related to drought.
- Utility providers can see decreases in revenue as water supplies diminish.
- Utilities providers may cut back energy generation and service to their customers to prioritize critical service needs.
- Fish and wildlife food and habitat will be reduced or degraded over time during a drought and disease will increase, especially for aquatic life.
- Wildlife will move to more sustainable locations creating higher concentrations of wildlife in smaller areas, increasing vulnerability, and further depleting limited natural resources.
- There are five federally endangered threatened, or candidate species within Wichita County. Severe and prolonged drought can result in the reduction of a species or cause the extinction of a species altogether.
- Plant life will suffer from long-term drought. Wind and erosion will also pose a threat to plant life as soil quality will decline. The urban tree canopy, including county-wide parks, are vulnerable to the impacts of prolonged drought.
- Dry and dead vegetation will increase the risk of wildfire.
- Drought poses a significant risk to annual and perennial crop production and overall crop quality leading to higher food costs.
- Drought-related declines in production may lead to an increase in unemployment.
- Drought may limit livestock grazing resulting in decreased livestock weight, potential increased livestock mortality, and increased cost for feed.
- Negatively impacted water suppliers may face increased costs resulting from the transport water or developing supplemental water resources.
- Long term drought may negatively impact future economic development.

The overall extent of damage caused by periods of drought is dependent on its extent and duration. The level of preparedness and pre-event planning done by government, businesses, and citizens will contribute to the overall economic and financial conditions in the aftermath of a drought event. The Wichita County planning area, including all participating jurisdictions, will implement a drought contingency plan / protocol based on their area during time of drought.

CLIMATE CHANGE CONSIDERATIONS

With the range of factors influencing drought conditions, it is impossible to make quantitative statewide projections of drought trends; however, many factors point toward increased drought severity. Drought will continue to be driven largely by precipitation variability over multiple decades, with long-term precipitation trends expected to be relatively small. Other factors affecting drought impacts, such as increased temperatures and improved plant water use efficiency, decrease water availability but will cause drought impact trends to be highly sector-specific, with the impacts possibly smaller for agriculture than for surface water supply.⁷

The Wichita County planning area can anticipate an increased likelihood of droughts in the future due to an estimated increase in the number of dry days in the Wichita County area. In addition, it is projected that future changes to Wichita County and all participating jurisdictions will include

⁷ Cleaveland, M. K., T. H. Votteler, D. K. Stahle, R. C. Casteel, and J. L. Banner, 2011: Extended Chronology of Drought in South Central, Southeastern and West Texas. Texas Water Journal, 2, 54-96, as cited in as cited in Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, Texas A&M University Office of the Texas State Climatologist, 2021 update.

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increased temperatures, longer multi-day heatwaves and greater variability in precipitation, with an expected decrease in precipitation in the summer and increase in the fall.



SECTION 6

EXTREME HEAT

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HAZARD DESCRIPTION

Extreme heat is a prolonged period of excessively high temperatures and exceptionally humid conditions. Extreme heat during the summer months is a common occurrence throughout the State of Texas, and the Wichita County planning area, including participating jurisdictions, is no exception. The county typically experiences extended heat waves or an extended period of extreme heat and is often accompanied by high humidity.



Although heat can damage buildings and facilities, it presents a more significant threat to the safety and welfare of citizens. The major human risks associated with extreme heat include heat cramps, sunburn, dehydration, fatigue, heat exhaustion, and even heat stroke. The most vulnerable population to heat casualties are children and the elderly or infirmed who frequently live on low fixed incomes and cannot afford to run air-conditioning on a regular basis. This population is sometimes isolated, with no immediate family or friends to look out for their well-being.

LOCATION

While extreme heat events can occur throughout the Wichita County planning area, including participating jurisdictions, the areas where heat stays throughout the day are largely dependent on the type of land use and ground cover. Areas with large amounts of impervious and dark surfaces such as roads and roofs, heat up quickly and remain hot throughout the day. These areas, which tend to be urban and industrial, are not able to cool down overnight and start the day with higher morning temperatures in comparison to less dense areas that have more trees and vegetation. While extreme heat was found to be more prevalent in certain areas of the county, with no geographic boundary, extreme heat can occur anywhere in the Wichita County planning area.

EXTENT

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

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Administration (NOAA), this relationship is referred to as the “Heat Index” and is depicted in Figure 6-1. This index measures how hot it feels outside when humidity is combined with high temperatures.

Figure 6-1. Extent Scale for Extreme Summer Heat¹

Temperatures (°F)		Temperatures (°F)		Temperatures (°F)		Temperatures (°F)	
40	80 - 88: CAUTION	40	90 - 96: EXTREME CAUTION	40	98 - 106: DANGER	40	108 - 110: EXTREME DANGER
45	80 - 88: CAUTION	45	90 - 94: EXTREME CAUTION	45	96 - 104: DANGER	45	106 - 110: EXTREME DANGER
50	80 - 86: CAUTION	50	88 - 94: EXTREME CAUTION	50	96 - 102: DANGER	50	104 - 110: EXTREME DANGER
55	80 - 86: CAUTION	55	88 - 92: EXTREME CAUTION	55	94 - 100: DANGER	55	102 - 110: EXTREME DANGER
60	80 - 84: CAUTION	60	86 - 90: EXTREME CAUTION	60	92 - 98: DANGER	60	100 - 110: EXTREME DANGER
65	80 - 84: CAUTION	65	86 - 90: EXTREME CAUTION	65	92 - 96: DANGER	65	98 - 110: EXTREME DANGER
70	80 - 84: CAUTION	70	86 - 88: EXTREME CAUTION	70	90 - 94: DANGER	70	96 - 110: EXTREME DANGER
75	80 - 82: CAUTION	75	84 - 88: EXTREME CAUTION	75	90 - 94: DANGER	75	96 - 110: EXTREME DANGER
80	80 - 82: CAUTION	80	84 - 86: EXTREME CAUTION	80	88 - 92: DANGER	80	94 - 110: EXTREME DANGER
85	80 - 82: CAUTION	85	84 - 86: EXTREME CAUTION	85	88 - 90: DANGER	85	92 - 110: EXTREME DANGER
90	80: CAUTION	90	82 - 84: EXTREME CAUTION	90	86 - 90: DANGER	90	92 - 110: EXTREME DANGER
95	80: CAUTION	95	82 - 84: EXTREME CAUTION	95	86 - 88: DANGER	95	90 - 110: EXTREME DANGER
100	80: CAUTION	100	82 - 84: EXTREME CAUTION	100	86 - 88: DANGER	100	90 - 110: EXTREME DANGER

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

The Extent Scale in Figure 6-1 displays varying categories of caution depending on the relative humidity combined with the temperature. For example, when the temperature is at 90 degrees Fahrenheit (°F) or lower, caution should be exercised if the humidity level is at or above 40 percent.

The shaded zones on the chart indicate varying symptoms or disorders that could occur depending on the magnitude or intensity of the event. “Caution” is the first category of intensity, and it indicates when fatigue due to heat exposure is possible. “Extreme Caution” indicates that sunstroke, muscle cramps, or heat exhaustion are possible, and a “Danger” level means that these symptoms are likely. “Extreme Danger” indicates that heat stroke is likely. The National Weather Service (NWS) initiates alerts based on the Heat Index as shown in Table 6-1.

Table 6-1. Heat Index and Warnings

CATEGORY	HEAT INDEX	POSSIBLE HEAT DISORDERS	WARNING TYPE
Extreme Danger	125°F and higher	Heat stroke or sun stroke likely.	An Excessive Heat Warning is issued if the Heat Index rises above 105°F at least 3 hours during the day or above 80°F at night.
Danger	103 – 124°F	Sunstroke, muscle cramps, and / or heat exhaustion are likely. Heatstroke possible with	

¹ Source: NOAA

SECTION 6: EXTREME HEAT

CATEGORY	HEAT INDEX	POSSIBLE HEAT DISORDERS	WARNING TYPE
		prolonged exposure and / or physical activity.	
Extreme Caution	90 – 103°F	Sunstroke, muscle cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.	A heat advisory will be issued to warn that the Heat Index may exceed 105°F.
Caution	80 – 90°F	Fatigue is possible with prolonged exposure and / or physical activity.	

Wichita County follows the National Weather Service Norman Office protocol when it comes to extreme heat. The County will activate a heat advisory when the heat index reaches 105°F -110°F on at least two consecutive days.

Wichita County lies largely in the eastern portion of the Central Texas Rolling Red plains, with the county being drained from the southwest to the northeast by the Red and Wichita Rivers. Typically, elevation rises approximately one foot per mile inland, with elevations ranging from 900 to 1,200 feet above sea level. Wichita County has one major region, the Rolling Red Prairies which is central within the county. The county's terrain consists of rolling plains with rounded slopes and shallow, comparatively broad valleys, and its vegetation can be characterized by mid to tall grasses, mesquite and shinnery oak trees, as well as cottonwood, elm, hackberry, and pecan trees along the streams. Wichita County has an annual average rainfall of 20-28 inches, and a temperature average ranging from a minimum of 28°F in January to a maximum of 98°F in July. The average growing season is 221 days. The hottest temperature ever recorded for the planning area was 117°F on June 28, 1990 in the City of Wichita Falls.²

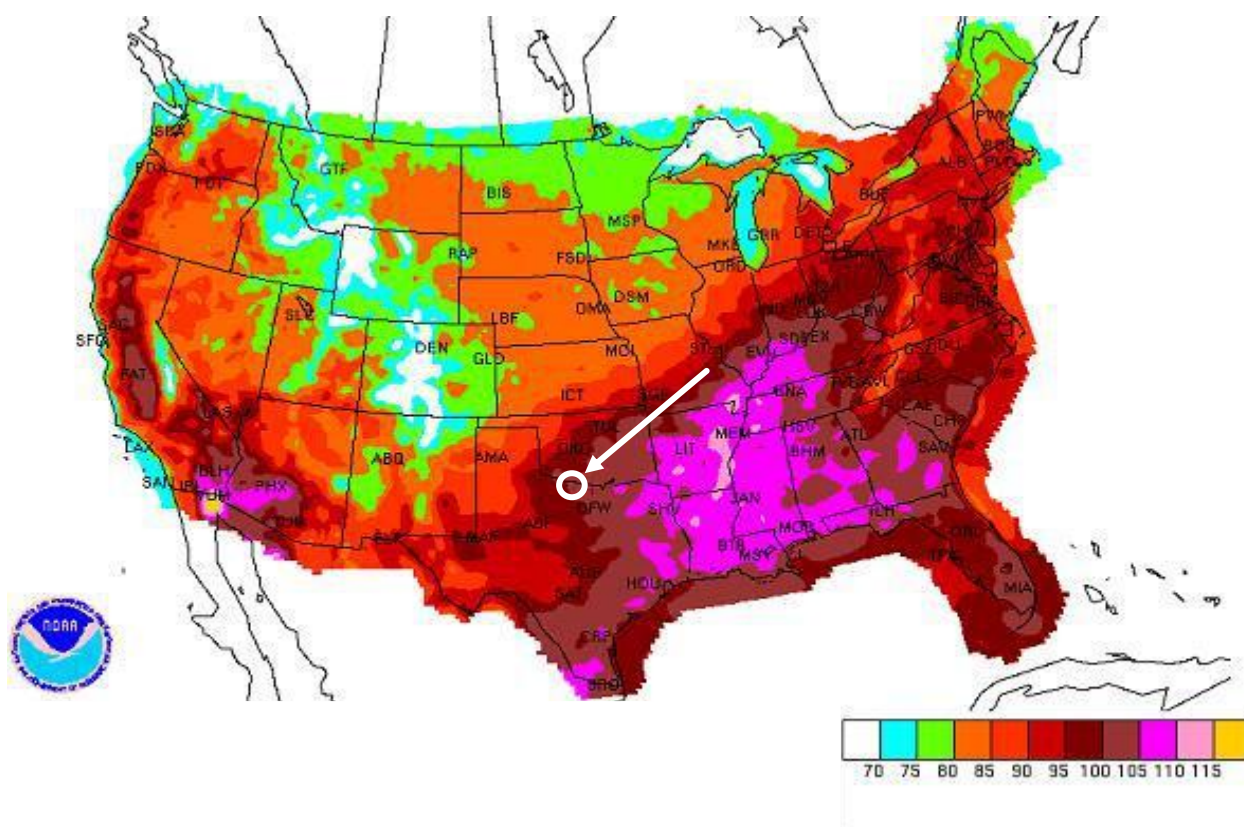
Due to its geography and its warm, sunny, and humid climate, the Wichita County planning area can expect an extreme heat event each summer. Citizens, especially children and the elderly, should exercise caution by staying out of the heat for prolonged periods when a heat advisory or excessive heat warning is issued. In addition, those working or remaining outdoors for extended periods of time are at greater risk.

Figure 6-2 displays the daily maximum heat index as derived from NOAA based on data compiled from 1838 to 2015. The white circle shows the Wichita County planning area. The planning area is primarily represented in brown, which indicates an average daily heat index of 95°F to 105°F. The daily heat index coupled with the historic high temperatures indicate that the Wichita County planning area and the participating jurisdictions could experience dangerous heat from 95°F to 117°F, and should mitigate to the extent of “Danger,” which can include sunstroke, muscle cramps, heat exhaustion, and potential heat stroke. This is the highest temperature (extreme caution category) the planning area can anticipate based on historical events.

² NOAA National Weather Service: <https://www.weather.gov/oun/climate-sps-heatwave>

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Figure 6-2. Average Daily Maximum Heat Index Days³



HISTORICAL OCCURRENCES

Previous occurrences for extreme heat are derived from the NCEI database, which identifies extreme heat events on a county-wide level for each event. According to heat-related incidents located solely within Wichita County, there have been six extreme heat events on record for the planning area which includes all participating jurisdictions (Table 6-2). Historical extreme heat information, as provided by the NCEI, shows extreme heat activity across a multi-county forecast area for each event, the appropriate percentage of the total property and crop damage reported for the entire forecast area has been allocated to each county impacted by the event.

Historical extreme heat data exists for the Wichita County planning area, per the NCEI database, from January 1996 through June 2023, though no extreme heat events were reported in the database after 2006. This is typical for the area as extreme temperatures occur in the planning area on a regular basis and are therefore not reported as a noteworthy event. Only extreme heat events that have been reported have been factored into this Risk Assessment. It is highly likely additional extreme heat occurrences have gone unreported before and during the recording period. Due to the limited number of reported events, average high temperatures have been analyzed in order to determine the probability of future events.

³ NRDC and the white circle indicates the Wichita County planning area.

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Table 6-2. Historical Extreme Heat Events, 1996-2023⁴

DATE	DEATH	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
6/2/1998	0	2	\$0	\$0
7/3/1998	1	0	\$0	\$0
7/14/1998	1	0	\$0	\$0
8/10/1999	1	0	\$0	\$0
8/9/2000	1	0	\$0	\$0
7/11/2006	0	0	\$0	\$0
Total	4	2	\$0	\$0

Table 6-3. Historical Extreme Heat Events Summary, 1996-2023

JURISDICTION	NUMBER OF EVENTS	DEATH	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Wichita County	6	4	2	\$0	\$0

Based on the list of historical extreme heat events for the Wichita County planning area, no events were reported to the NCEI since the 2018 Plan, though it is noted that these events occur regularly each year.

SIGNIFICANT EVENTS

August 9, 2000 – Wichita County

A 74-year-old man was found dead in his City of Wichita Falls home. The State Medical Examiner determined hyperthermia contributed to his death along with high blood pressure and heart disease. A screen door and numerous windows to the house were found open, however water leading to the house was shut off several days before.

August 10, 1999 – Wichita County

Excessive heat affected portions of the western north portion of Texas from August 10th through August 12th. The average high temperature reported for the area in Wichita County was 108°F, with the average low temperature being 80°F. As a result of this event, two persons died from the excessive heat. A 55-year-old man died in his City of Wichita Falls home on the 10th, and an 80-year-old woman died in the hospital.

May - October, 1998 – Wichita County

Excessive heat and drought conditions affected the western portions of North Texas from May through early October with the most intense heat and severe drought conditions occurring from mid-June through early September. There were two fatalities both occurring in the City of Wichita Falls and at least two injuries directly related to the heat. Agricultural losses are estimated at 2.1 billion dollars for the entire state of Texas.. For the City of Wichita Falls, the summer of 1998 was

⁴ NOAA, NCEI Storm Events Database events reported from January 1996 through June 2023.

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the second hottest and seventh driest on record, with record warm temperatures continuing through September. The City of Wichita Falls recorded an average temperature of 83.4°F in September.

The first fatality directly related to the heat occurred on July 3rd, when a 75-year-old man was found dead in his home in the City of Wichita Falls. The second and last report of a heat-related fatality occurred on July 14th, when a 74-year-old man was found dead in his home, also in the City of Wichita Falls. Two people from the City of Wichita Falls were treated for heat related injuries on June 2nd at United Regional Health Care.

PROBABILITY OF FUTURE EVENTS

According to historical records, the Wichita County planning area has experienced six events in a 27.5-year reporting period. However, it can be assumed that events have gone unreported due to the average daily temperatures throughout the summer, indicating multiple events every year. This supports a highly likely probability of future events. See additional information on the impacts of climate change at the end of this section.

VULNERABILITY AND IMPACT

There is no defined geographic boundary for extreme heat events. While the entirety of the Wichita County planning area, including participating jurisdictions, is exposed to extreme temperatures, existing buildings, infrastructure, and critical facilities are not likely to sustain significant damage from extreme heat events. Therefore, any estimated property losses associated with the extreme heat hazard are anticipated to be minimal across the area.

Every summer, the hazard of heat-related illness becomes a significant public health issue throughout much of the United States. Mortality from all causes increases during heat waves, and excessive heat is an important contributing factor to deaths from other causes, particularly among the elderly. Extreme temperatures present a significant threat to life and safety for the population of Wichita County as a whole. Heat casualties, for example, are typically caused by a lack of adequate air-conditioning or heat exhaustion. The most vulnerable population to heat casualties are the elderly or infirmed who frequently live on fixed incomes and cannot afford to run air-conditioning on a regular basis. This population is sometimes isolated, with no immediate family or friends to look out for their well-being. Children may also be more vulnerable if left unattended in vehicles. Students are also susceptible, as sporting events and practices are often held outside during early fall or late spring when temperatures are at the highest. In addition, populations living below the poverty level are unable to run air-conditioning on a regular basis and are limited in their ability to seek medical treatment. Another segment of the population at risk are those whose jobs consist of strenuous labor outdoors. Additionally, livestock and crops can become stressed, decreasing in quality or in production, during times of extreme heat.

The population over 65 in Wichita County is estimated at 14.6 percent of the total population and children under the age of 5 are estimated at 6.3 percent, for a combined estimated total of 27,060 potentially vulnerable residents in the planning area based on age. In addition, an estimated 16.6 percent of the planning area population live below the poverty level. Underprivileged populations are disproportionately impacted by extreme heat events as they are less likely to be able to afford air conditioning during the hot summer months as well as less likely to have access to medical care.

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Table 6-4. Populations at Greater Risk by Participating Jurisdictions

JURISDICTION	POPULATION 65 AND OLDER	POPULATION UNDER 5	POPULATION BELOW POVERTY LEVEL
Wichita County	18,932	8,128	21,484
City of Burkburnett	2,190	716	1,063
City of Cashion Community	52	14	9
City of Electra	469	126	497
City of Iowa Park	1,184	779	524
City of Pleasant Valley	67	20	25
City of Wichita Falls	13,675	6,217	18,974

Extremely high temperatures can have significant secondary impacts, leading to droughts, water shortages, increased fire danger, and prompt excessive demands for energy. The possibility of rolling blackouts increases with unseasonably high temperatures in what is a normally mild month with low power demands. Typically, more than 12 hours of warning time would be given before the onset of an extreme heat event.

In terms of vulnerability to structures, the impact from extreme heat would be considered “Limited.” It is possible that critical facilities and infrastructure could be shut down for 24 hours or less due to high demand on the power grid and potential rolling blackouts. Less than ten percent of residential and commercial property could be damaged if extreme heat events lead to structure fires. Based on historical records over a 27.5-year period, annualized property and crop losses for the Wichita County planning area, including participating jurisdictions, are negligible. However, with the historical records indicating four fatalities and two injuries, the impact of an extreme heat event can be considered “Substantial” with multiple fatalities possible if proper measures are not taken.

The Wichita County Planning Team identified the following critical facilities as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by extreme heat events. The following critical facilities would be vulnerable to extreme heat events in the Wichita County planning area, including participating jurisdictions. For a comprehensive list by participating jurisdiction please see Appendix C.

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Table 6-5. Critical Facilities Vulnerable to Extreme Heat Events

CRITICAL FACILITIES	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS, Hospitals)	<ul style="list-style-type: none">• Emergency operations, services and response times may be significantly impacted due to power outages, and / or loss of communications.• Exposure to heat can cause heat illnesses in first responders, especially for those in heavy equipment.• Roads may become impassable due to excessive heat causing asphalt roads to soften and concrete roads to shift or buckle impacting response times by emergency services.• Extended power outages due to increased usage may lead to possible looting, destruction of property, and theft, further burdening law enforcement resources.
Airport, Academic Institutions, Evacuation Centers & Shelters, Governmental Facilities	<ul style="list-style-type: none">• Facilities, infrastructure, or critical equipment including communications may be damaged, destroyed or otherwise inoperable.• Power outages due to increased usage could disrupt critical care.• Backup power sources could be damaged.• Evacuations may be necessary due to extended power outages, breaks in water main lines or other associated damage to facilities.• Facilities, infrastructure, or critical equipment including communications may be damaged, destroyed or otherwise inoperable.• Economic disruption due to power outages negatively impact airport services as well as area businesses reliant on airport operations.
Utility Services and Infrastructure (electric, water, wastewater, communications)	<ul style="list-style-type: none">• Emergency operations, services and response times may be significantly impacted due to power outages, and / or loss of communications.• Roads may become impassable due to excessive heat causing asphalt roads to soften and concrete roads to shift or buckle impacting response times by emergency services.• Breaks in water main lines or other associated damage to facilities

ASSESSMENT OF IMPACTS

The greatest risk from extreme heat is to public health and safety. Extreme heat conditions can be frequently associated with a variety of impacts, including:

- Vulnerable populations, particularly the elderly (14.6 percent of total population) and children under 5 (6.3 percent of total population), can face serious or life-threatening health problems from exposure to extreme heat including hyperthermia, heat cramps, heat exhaustion, and heat stroke (or sunstroke).
- Response personnel, including utility workers, public works personnel, and any other professions where individuals are required to work outside, are more subject to extreme heat related illnesses since their exposure would typically be greater.
- High energy demand periods can outpace the supply of energy, potentially creating the need for rolling brownouts which would elevate the risk of illness to vulnerable residents.
- Highways and roads may be damaged by excessive heat causing asphalt roads to soften and concrete roads to shift or buckle.

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- Vehicle engines and cooling systems typically run harder during extreme heat events resulting in increases in mechanical failures.
- Extreme heat events during times of drought can exacerbate the environmental impacts associated with drought, decreasing water and air quality and further degrading wildlife habitat.
- Extreme heat increases ground-level ozone (smog), increasing the risk of respiratory illnesses.
- Negatively impacted water suppliers may face increased costs resulting from the transport of water resources or development of supplemental water resources.
- Tourism and recreational activities predominant in the planning area may be negatively impacted during extreme heat events, reducing seasonal revenue such as River Bend Nature Center.
- Outdoor activities may see an increase in school injury or illness during extreme heat events.

The economic and financial impacts of extreme heat on the community will depend on the duration of the event, demand for energy, drought associated with extreme heat, and many other factors. The level of preparedness and the amount of planning done by the jurisdiction, local businesses, and citizens will impact the overall economic and financial conditions before, during, and after an extreme heat event.

CLIMATE CHANGE CONSIDERATIONS

Climate change is expected to lead to an increase in average temperatures as well as an increase in frequency, duration, and intensity of extreme heat events. With no reductions in emissions worldwide, the state of Texas is projected to experience an additional 30 to 60 days per year above 100°F than what is experienced now.⁵

⁵ Nielsen-Gammon, John, Holman, Sara, Buley, Austin and Jorgensen, Savannah. Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, 2021 Update. Texas A&M University Office of the Texas State Climatologist. October 7, 2021. <https://climatexas.tamu.edu/files/ClimateReport-1900to2036-2021Update>



SECTION 7 FLOOD

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National Flood Insurance Program (NFIP) Participation	19
NFIP Compliance and Maintenance	21
Repetitive Loss	22

HAZARD DESCRIPTION

Floods generally result from excessive precipitation. The severity of a flood event is determined by a combination of several major factors, including stream and river basin topography and physiography; precipitation and weather patterns; recent soil moisture conditions; and the degree of vegetative clearing and impervious surface. Typically, floods are long-term events that may last for several days.

The primary types of general flooding are inland and coastal flooding. Due to Wichita County's inland location, only inland flooding is profiled in this section. Inland or riverine flooding is a result of excessive precipitation levels and water runoff volumes within the watershed of a stream or river. Inland or riverine flooding is overbank flooding of rivers and streams, typically resulting from large-scale weather systems that generate prolonged rainfall over a wide geographic area, thus it is a naturally occurring and inevitable event. Some river floods occur seasonally when winter or spring rainfalls fill river basins with too much water, too quickly. Torrential rains from decaying hurricanes or tropical systems can also produce river flooding.

LOCATION

Flooding is one of the more severe hazards facing Wichita County and the planning area. The Flood Insurance Rate Maps (FIRMs) prepared by FEMA provide an overview of flood risk but can also be used to identify the areas of the county that are vulnerable to flooding. FIRMs are used to regulate new development and to control the substantial improvement and repair of substantially damaged buildings. Flood Insurance Studies (FIS) are often developed in conjunction with FIRMs. The FIS typically contains a narrative of the flood history of a community and discusses the engineering methods used to develop the FIRMs. The FIS also contains flood profiles for studied flood sources and can be used to determine Base Flood Elevations (BFEs) for some areas.

Revised or new studies are now presented as countywide FIS's and include incorporated areas. The FIS for Wichita County is dated February 3, 2010, and includes the participating jurisdictions. This FIS compiles all previous flood information and includes data collected on numerous waterways. Areas that are most vulnerable to flooding include low-lying areas throughout the

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county. Wichita County continues to acquire homes in these flood prone areas in an effort to save lives and decrease property damage.

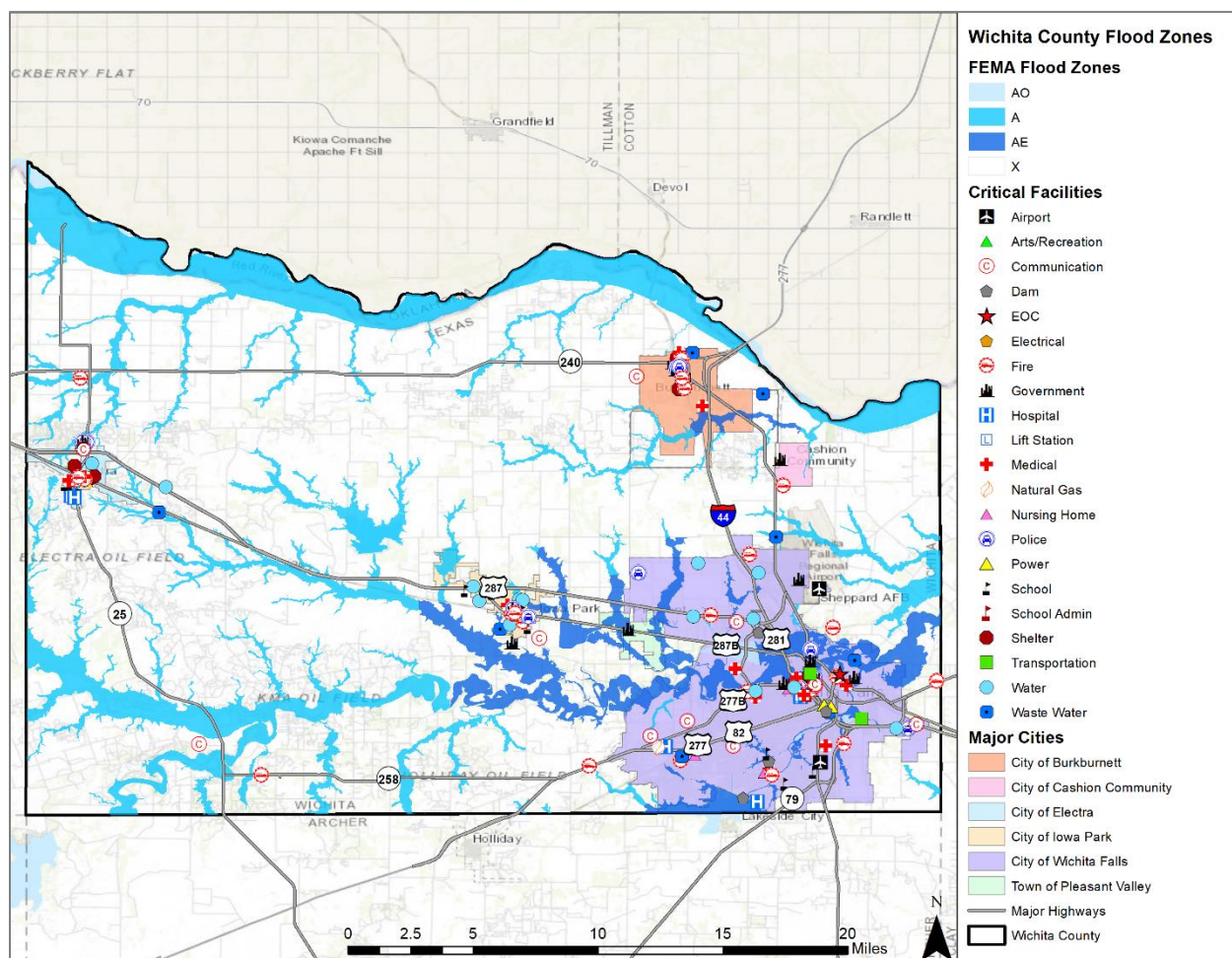
The Flood Insurance Rate Map (FIRM) data provided by FEMA for the Wichita County planning area shows the following flood hazard areas:

- Zone A: Areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance requirements and floodplain management standards apply.
- Zone AE: Areas subject to inundation by 1-percent-annual-chance shallow flooding. It is the base floodplain where BFEs are provided. AE zones are now used on new format FIRMs instead of A1-30 zones.
- Zone AO: Areas subject to inundation by 1-percent-annual-chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average flood depths derived from detailed hydraulic analyses are shown in this zone.
- Zone X: Moderate risk areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent-annual-chance flood by a levee. No BFEs or base flood depths are shown within these zones.

Locations of flood zones in the Wichita County planning area, including participating jurisdictions, based on the digital Flood Insurance Rate Map (DFIRM) from FEMA are illustrated in Figure 7-1 through Figure 7-7.

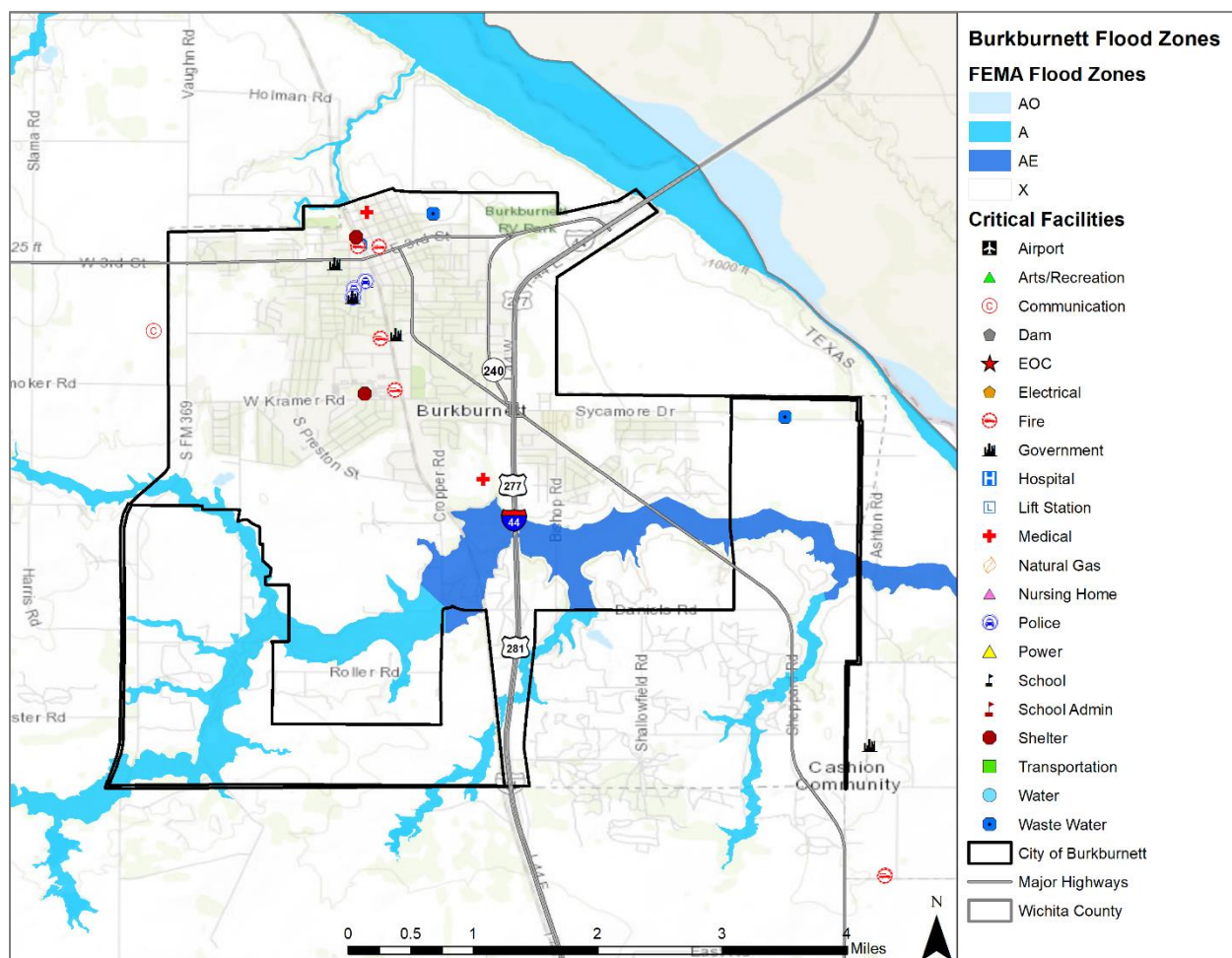
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Figure 7-1. Estimated Flood Zones in Wichita County



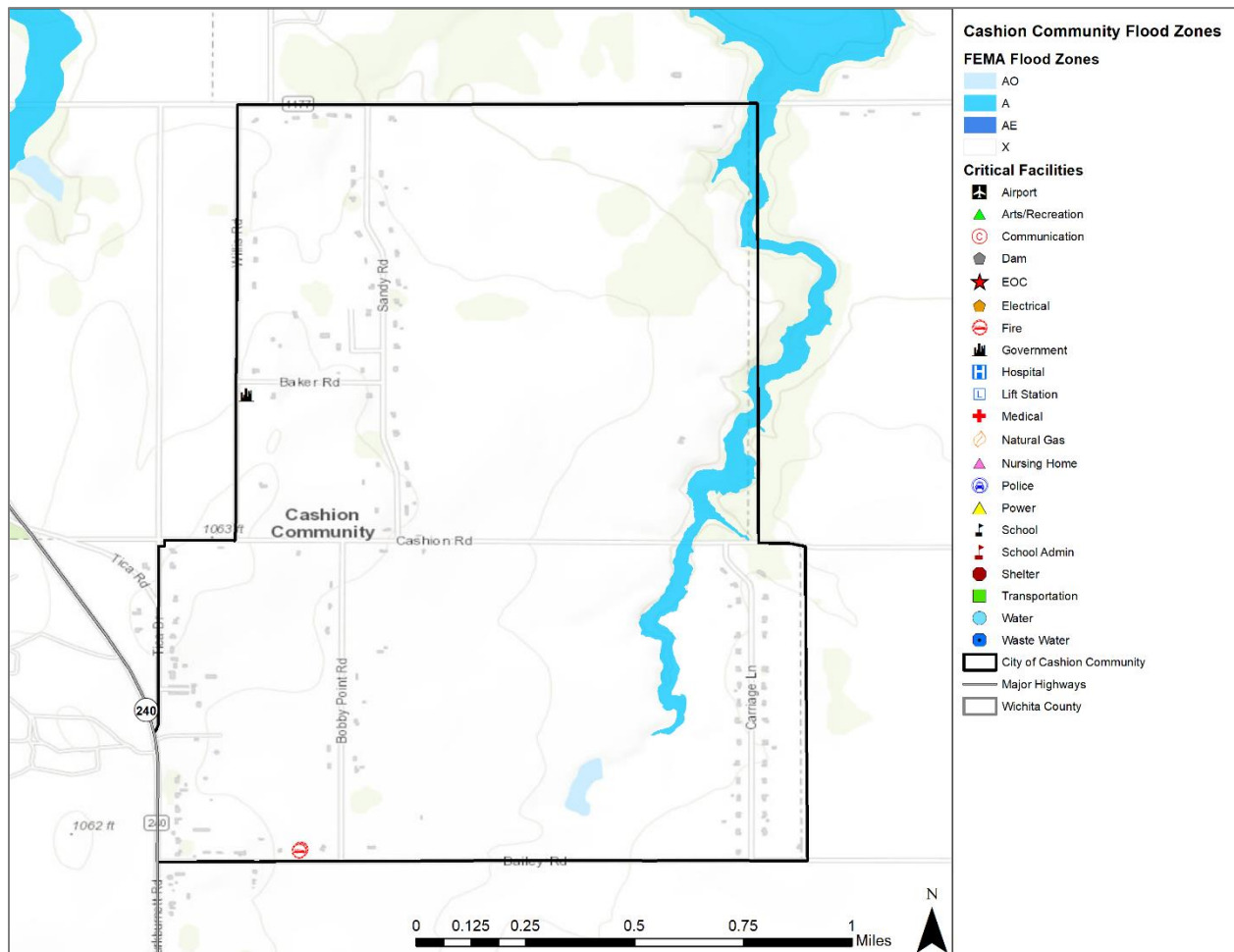
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Figure 7-2. Estimated Flood Zones in City of Burkburnett



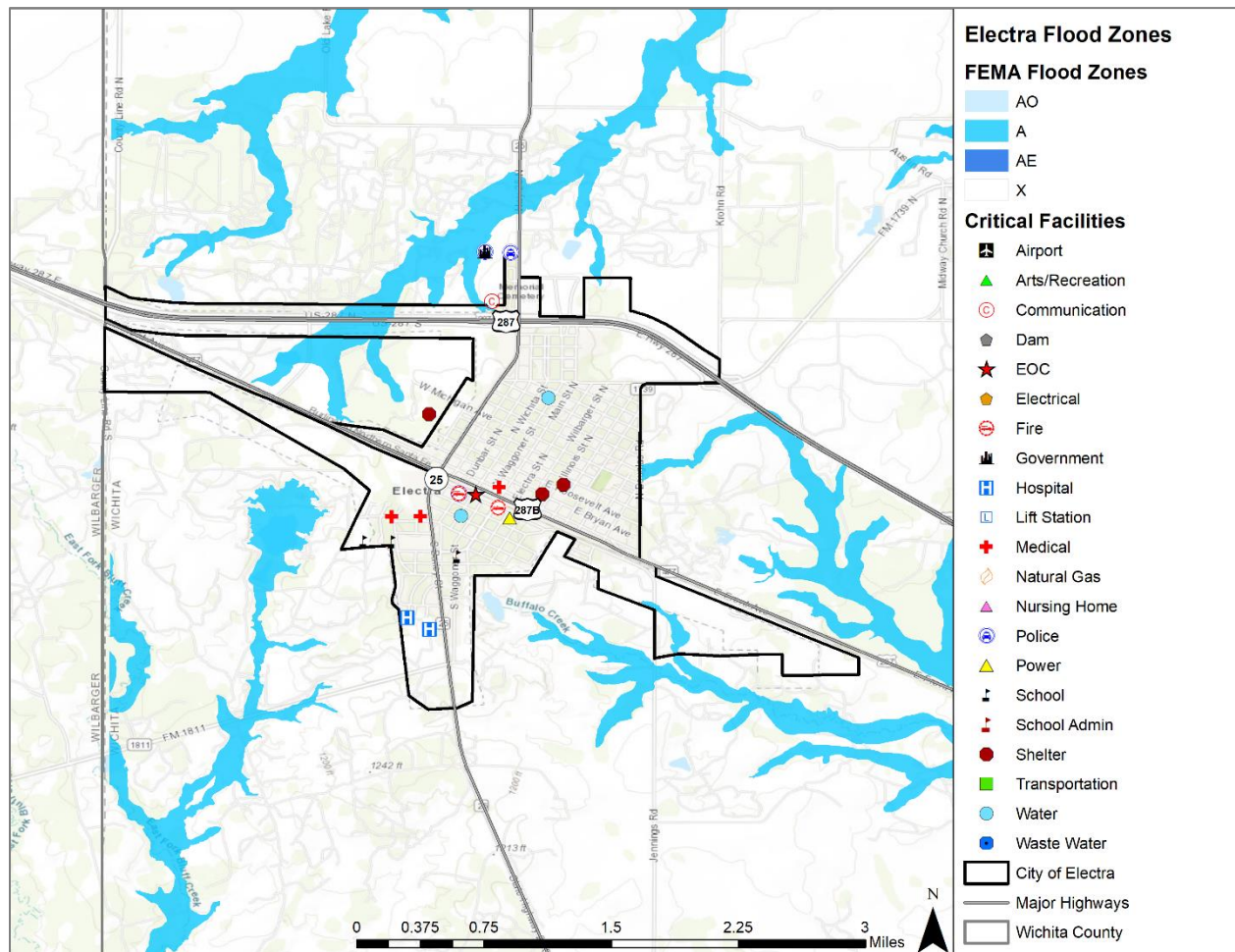
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Figure 7-3. Estimated Flood Zones in City of Cashion Community



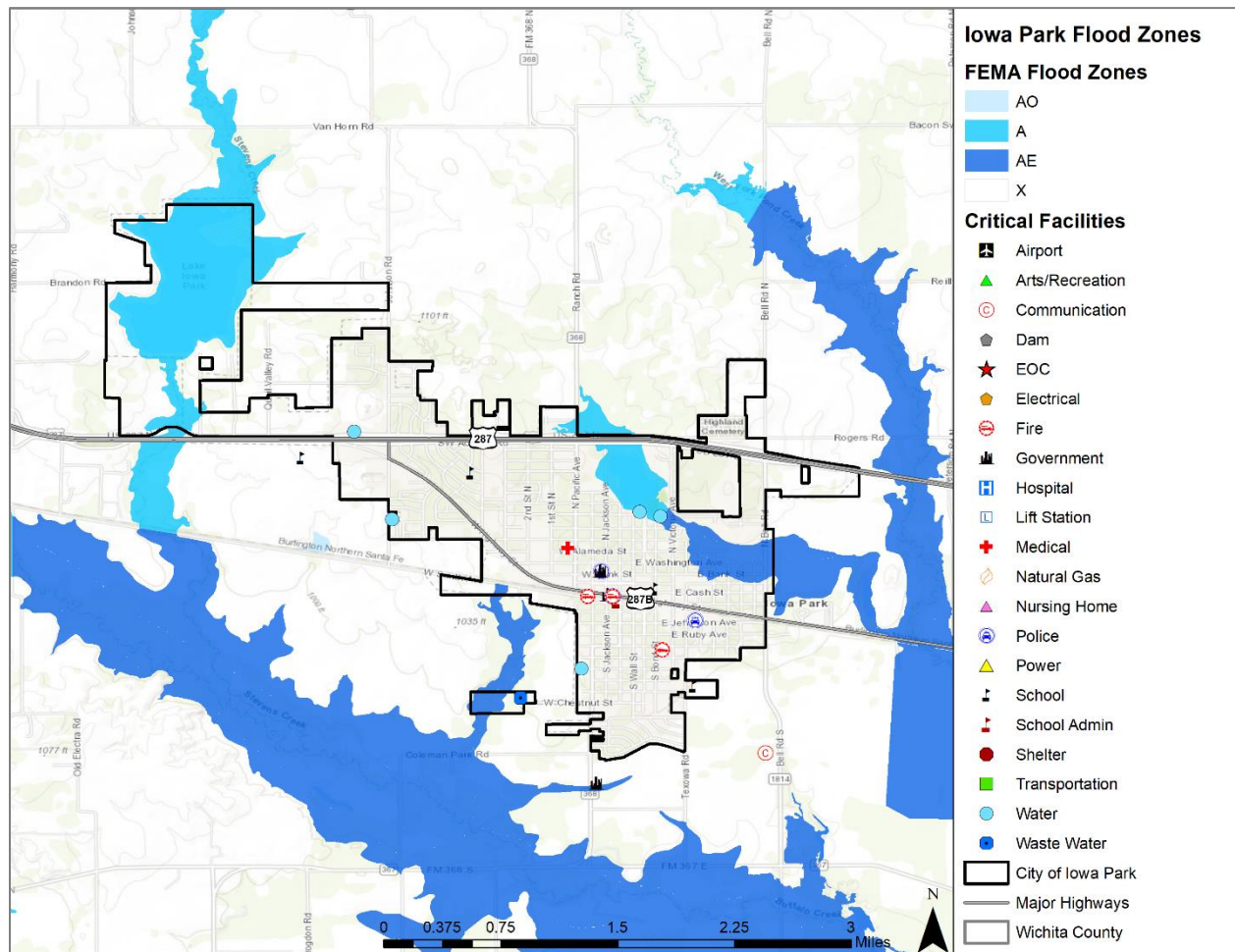
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Figure 7-4. Estimated Flood Zones in City of Electra



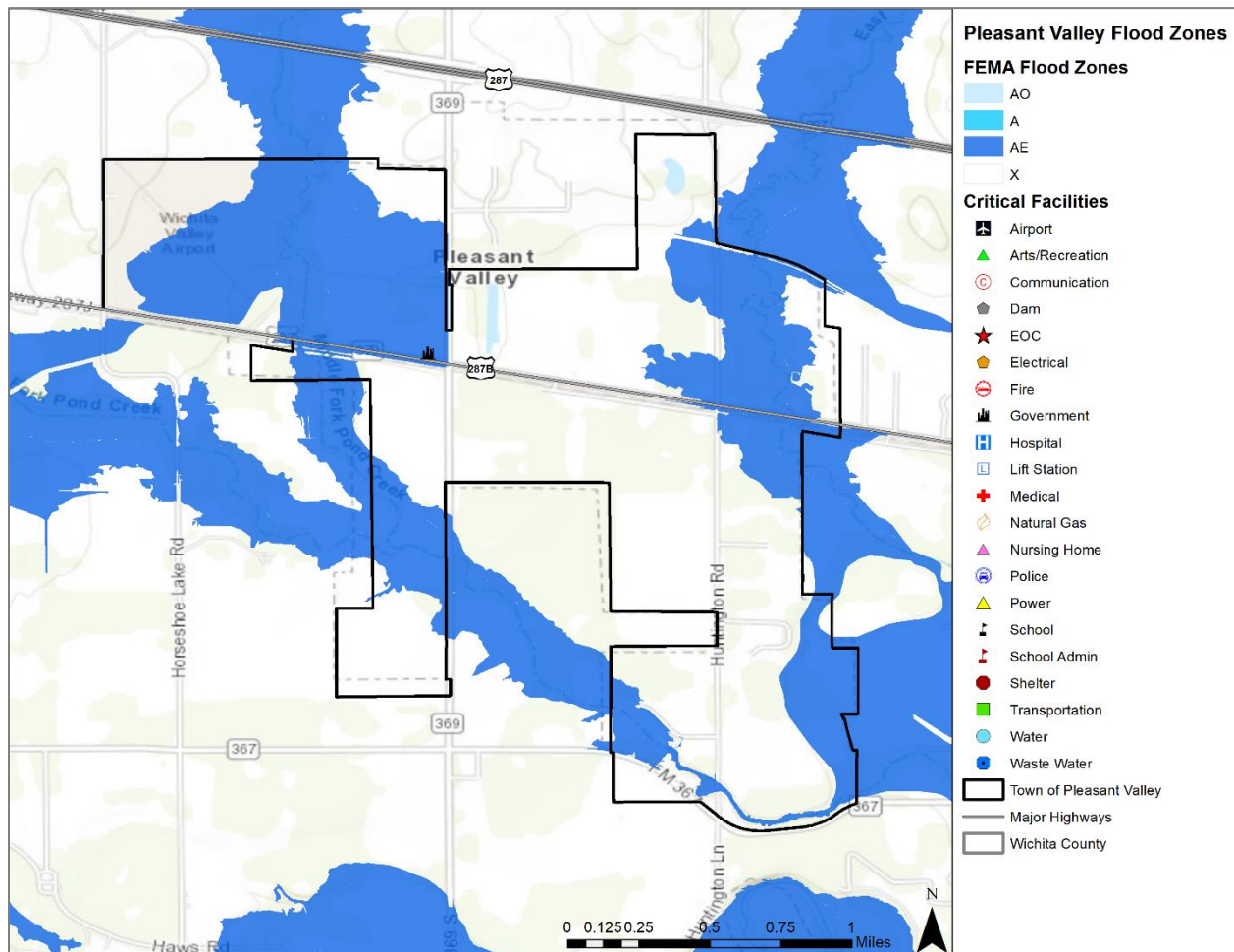
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Figure 7-5. Estimated Flood Zones in City of Iowa Park



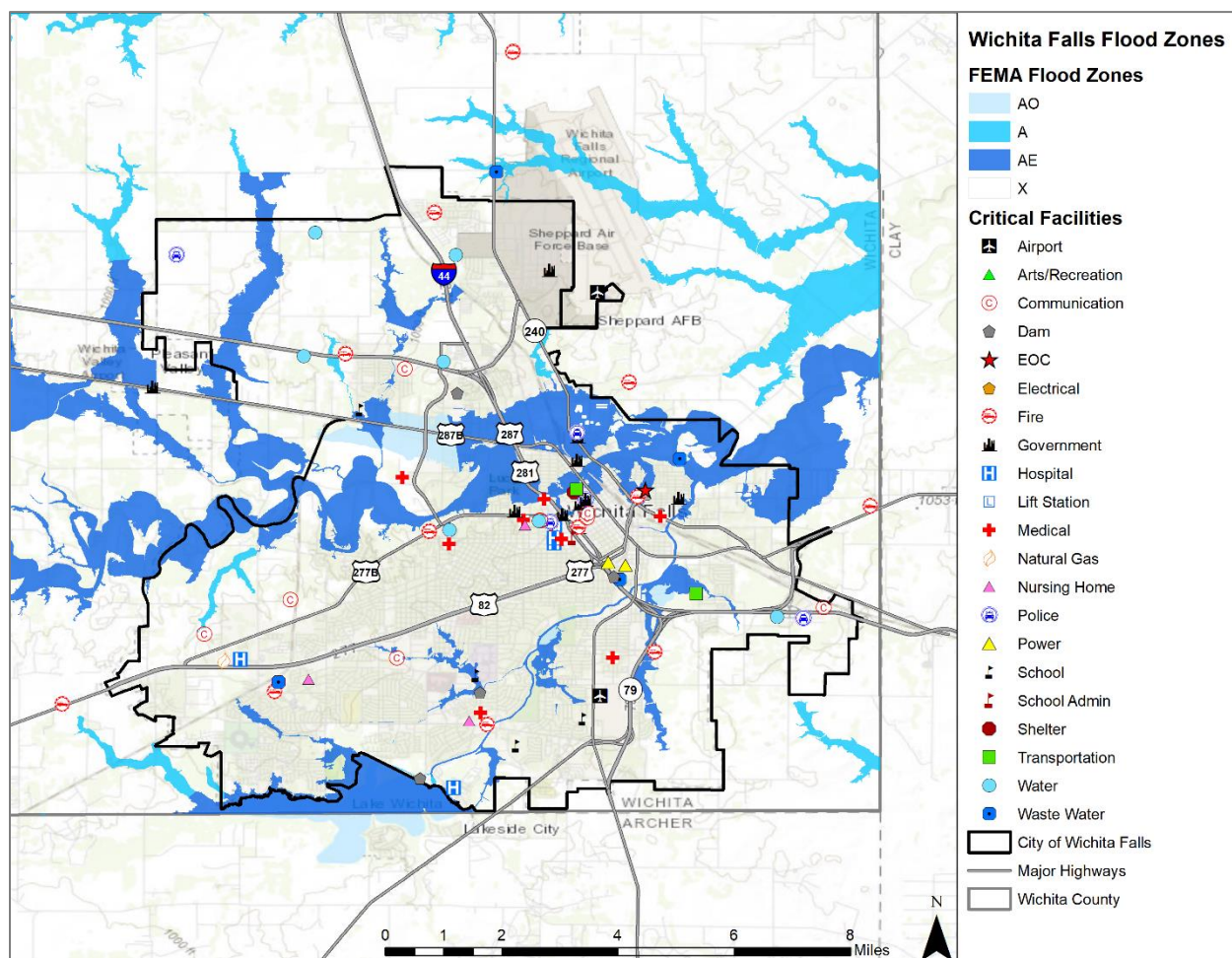
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Figure 7-6. Estimated Flood Zones in City of Pleasant Valley



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Figure 7-7. Estimated Flood Zones in City of Wichita Falls



EXTENT

The severity of a flood event is determined by a combination of several factors including stream and river basin topography and physiography; precipitation and weather patterns; recent soil moisture conditions; and degree of vegetative clearing and impervious surface. Typically, floods are long-term events that may last for several days.

Determining the intensity and magnitude of a flood event is dependent upon the flood zone and location of the flood hazard area in addition to depths of flood waters. Extent of flood damage can be expected to be more damaging in the areas that will convey a base flood. FEMA categorizes areas on the terrain according to how the area will convey flood water. Flood zones are the categories that are mapped on Flood Insurance Rate Maps. Table 7-1 provides a description of FEMA flood zones and the flood impact in terms of severity or potential harm. Flood Zones A, AE, AO, and X are the only hazard areas mapped in the planning area. Figure 7-1 through Figure 7-7 should be read in conjunction with the extent for flooding in Tables 7-1 and 7-2 to determine the intensity of a potential flood event.

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Table 7-1. Flood Zones

INTENSITY	ZONE	DESCRIPTION
HIGH	ZONE A	Areas with a one percent annual chance of flooding and a 26 percent 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 A1-30	These are known as numbered A Zones (e.g., A7 or A14). This is the base floodplain where the FIRM shows a Base Flood Elevation (BFE) (old format).
	ZONE AE	The base floodplain where base flood elevations are provided. AE Zones are now used on the new format FIRMs instead of A1-A30 Zones.
	ZONE AO	River or stream flood hazard areas and areas with a one percent or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from one to three feet. These areas have a 26 percent 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	Areas with a one percent annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from one to three feet. These areas have a 26 percent 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	Areas with a one percent 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.
	ZONE AR	Areas with a temporarily increased flood risk due to the building or restoration of a flood control system (such as a levee or a dam). Mandatory flood insurance purchase requirements will apply, but rates will not exceed the rates for unnumbered A zones if the structure is built or restored in compliance with Zone AR floodplain management regulations.
HIGH COASTAL	ZONE VE, V1-30	Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26 percent chance of flooding over the life of a 30-year mortgage. No base flood elevations are shown within these zones.
MODERATE to LOW	ZONE X 500	An area inundated by 500-year flooding; an area inundated by 100-year flooding with average depths of less than one foot or with drainage areas less than one square mile; or an area protected by levees from 100-year flooding.

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Zone A is interchangeably referred to as the 100-year flood, the one percent-annual chance flood, the Special Flood Hazard Area (SFHA), or more commonly, the base flood. This is the area that will convey the base flood and constitutes a threat to the planning area. The impact from a flood event can be more damaging in areas that will convey a base flood.

Structures built in the SFHA are subject to damage by rising waters and floating debris. Moving flood water exerts pressure on everything in its path and causes erosion of soil and solid objects. Utility systems, such as heating, ventilation, air conditioning, fuel, electrical systems, sewage maintenance systems and water systems, if not elevated above base flood elevation, may also be damaged.

The intensity and magnitude of a flood event is also determined by the depth of flood waters. Table 7-2 describes the stream gauge data provided by the United States Geological Survey (USGS).

Table 7-2. Extent for Wichita County¹

JURISDICTION ²	PEAK FLOOD EVENT
City of Burkburnett	Red River near the City of Burkburnett reached an overflow elevation of 13.8 in June of 1991. The average overflow elevation for Red River is 9.78 feet at this site.
City of Electra	Beaver Creek near the City of Electra reached an overflow elevation of 34.94 in May of 1987. The average overflow elevation for Beaver Creek is 24.6 feet at this site.
City of Iowa Park	Wichita River near the City of Iowa Park reached an overflow elevation of 28.5 in May of 2015. The average overflow elevation for Wichita River is 18.7 feet at this site.
City of Wichita Falls	Holliday Creek near the City of Wichita Falls reached an overflow elevation of 17.4 in May of 2015. The average overflow elevation for Holliday Creek is 11.4 feet at this site.
City of Wichita Falls	Wichita River near the City of Wichita Falls reached an overflow elevation of 24.4 in June of 2007. The average overflow elevation for Wichita River is 13.9 feet at this site.

The range of flood intensity that the planning area can experience is high, or Zone A. Based on historical occurrences, the Wichita County planning area, including participating jurisdictions, could expect to experience approximately 3 inches of rain within a 12-hour period, resulting in flash flooding.

The data described in Tables 7-1 and 7-2, together with Figure 7-1 through 7-7, and historical occurrences for the area, provides an estimated potential magnitude and severity for the Wichita County planning area, including participating jurisdictions. For example, the Cities of Burkburnett (Figure 7-2), Iowa Park (Figure 7-5) and Wichita Falls (Figure 7-7), have areas designated as

¹ Severity estimated by averaging floods at certain stage level over the history of flood events. Severity and peak events are based on U.S. Geological Survey data.

² Severity is provided for jurisdictions where peak data was provided.

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Zone A and AE. Reading these figures in conjunction with Table 7-1 means these mapped areas are at a high risk for flood.

HISTORICAL OCCURRENCES

Historical evidence indicates that areas within the planning area are susceptible to flooding, especially in the form of flash flooding. It is important to note that only flood events that have been reported have been factored into this risk assessment, therefore it is likely that additional flood occurrences have gone unreported before and during the recording period. Table 7-3 identifies historical flood events in the Wichita County planning area. Table 7-4 provides the historical flood event summary. Historical data is provided by planning team members and the Storm Prediction Center (NOAA), NCEI database for the Wichita County planning area, including all participating jurisdictions. There have been 35 recorded flood events in Wichita County, including all participating jurisdictions.

Table 7-3. Historical Flood Events, 1996-2023³

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
City of Wichita Falls	5/8/1997	0	0	\$288,586	\$0
City of Wichita Falls	8/3/1998	0	0	\$11,310	\$0
City of Wichita Falls	4/14/1999	0	0	\$111,198	\$0
Wichita County	5/27/1999	0	0	\$157,530	\$0
City of Wichita Falls	6/10/1999	0	0	\$18,533	\$0
City of Iowa Park	11/15/2004	0	0	\$40,317	\$0
City of Iowa Park	8/16/2005	0	0	\$23,525	\$0
City of Wichita Falls	6/16/2007	0	0	\$4,056,082 ⁴	\$0
City of Burkburnett	8/18/2008	0	0	\$35,148,051	\$0
City of Iowa Park	5/20/2015	0	0	\$647,627	\$0
City of Iowa Park	5/28/2015	0	0	\$103,620	\$0
City of Pleasant Valley	5/28/2015	0	0	\$10,362	\$0
City of Wichita Falls	6/22/2015	0	0	\$1,789,961 ⁵	\$0

³ Only recorded events with fatalities, injuries, and/or damages are listed, values are in 2023 dollars. Historical events are listed from January 1996 through June 2023.

⁴ The 2007 flood event was a federally declared disaster (DR-1709). The NCEI data base did not include damages for this event, however, the City of Wichita Falls provided damage estimates based on disaster assistance records.

⁵ The 2015 flood event was a federally declared disaster (DR-4223). The NCEI data base did not include a listing for the event in the City of Wichita Falls, however the City of Wichita Falls provided damage estimates based on disaster assistance records.

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JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
City of Burkburnett	10/7/2018	0	0	\$6,090	\$0
Wichita County	12/26/2018	0	0	\$12,261	\$0
TOTALS		0	0	\$42,425,053	\$0

Table 7-4. Summary of Historical Flood Events, 1996-2023

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Wichita County	8	0	0	\$169,790	\$0
City of Burkburnett	3	0	0	\$35,154,141	\$0
City of Cashion Community	0	-	-	-	-
City of Electra	2	0	0	\$0	\$0
City of Iowa Park	8	0	0	\$815,089	\$0
City of Pleasant Valley	1	0	0	\$10,362	\$0
City of Wichita Falls	13	0	0	\$6,275,670	\$0
TOTALS	35	0	0	\$42,425,053	\$0

Based on the list of historical flood events for the Wichita County planning area (listed above), no events have occurred since the 2018 Plan.

SIGNIFICANT EVENTS

Flash Flood on May 28, 2015 – City of Iowa Park

Several rounds of severe storms brought flooding and damaging winds to the Wichita County area, with several cars stranded in high water within the City of Iowa Park. There were no reported injuries as a result of the event, however, approximately \$103,620 (2023 dollars) in total damages was reported.

Flash Flood on May 20, 2015 – Wichita County / City of Iowa Park

Severe storms developed near the Wichita County and Oklahoma border causing residential flooding within the City of Wichita Falls. The number of homes damaged is unknown, but total damages were reported to be \$647,627 (2023 dollars).

Flash Flood on August 18, 2008 – Wichita County / City of Burkburnett

A strong upper-level storm system moved over northern Texas. Several waves of heavy showers and thunderstorms occurred, resulting in extremely high precipitation totals and widespread flooding and flash flooding within Wichita County, with significant impact to the Cities of Iowa Park, Burkburnett and Wichita Falls areas. Reports indicated that many city and county roads were closed due to high water, and many water rescues took place. Numerous cars and trucks were washed off roadways. Interstate 44 was closed from the City of Wichita Falls to the Red River due to as approximately two feet of water flowing over top of it. A 3.5 mile stretch of railroad track from the Cities of Wichita Falls to Burkburnett was washed out in several spots, as well. Due to the

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severe flooding the Cities of Burkburnett and Iowa Park were isolated for several hours as the flooding caused the roadways to be impassable.

In addition, reports indicated that many residential structures sustained flooding in which residents needed to be evacuated. A total of at least 118 homes were flooded with 19 destroyed. Wichita County was declared a disaster area, which made it eligible for federal disaster assistance. Monetary damages were estimated. Estimated monetary damages were \$35,148,051 (2023 dollars).

Flood on June 26, 2007 – City of Wichita Falls

In 2007, a storm system stalled over the City of Wichita Falls for over a week, causing major flooding due to a rise of the Wichita River. As a result, the city sustained residential flooding in the Tanglewood Subdivision and east-side portions of the community as well. As a result of the damage sustained, Wichita County and the City of Wichita Falls utilized the FEMA's Severe Repetitive Loss grant funding to purchase 22 homes in the City of Wichita Falls and approximately eight to ten homes were purchased within the county.

PROBABILITY OF FUTURE EVENTS

Based on 35 recorded historical occurrences within a 27.5-year reporting period within Wichita County planning area, including all participating jurisdictions, flooding is highly likely with 1 to 2 events per year anticipated. See Climate Change Considerations below for climate change impacts on future events.

VULNERABILITY AND IMPACT

A property's vulnerability to a flood depends on its location and proximity to the floodplain. Structures that lie along banks of a waterway are the most vulnerable and are often repetitive loss structures. Wichita County encourages development outside of the floodplain, and the impact for flood for the entire planning area is "Limited" as facilities and services would be shut down for less than one week, and less than 10 percent of property destroyed or with major damage.

Table 7-4 includes the critical facilities identified in Appendix C that were determined to be located within the SFHA by FIRM mapping.

Table 7-4. Critical Facilities in the Floodplain

CRITICAL FACILITIES	POTENTIAL IMPACTS
Emergency Response Departments (EOC, Fire, Police, EMS), Hospitals (2 Health Care Facilities, 1 EOC, 2 Police Stations, and 2 Fire Stations located in	<ul style="list-style-type: none">• Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications.• Emergency vehicles can be damaged by rising flood waters.• Flood-related rescues may be necessary at swift and low water crossings or in flooded neighborhoods where roads have become impassable, placing first responders in harm's way.• Evacuations may be required for entire neighborhoods because of rising floodwaters, further taxing limited response capabilities and increasing sheltering needs for displaced residents.• Power outages could disrupt communications, delaying emergency response times.

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CRITICAL FACILITIES	POTENTIAL IMPACTS
special flood hazard area)	<ul style="list-style-type: none"> • Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. • Washed out roads and bridges can impede emergency response vehicle access to areas. • Increased number of structure fires due to gas line ruptures and downed power lines, further straining the capacity and resources of emergency personnel. • First responders are exposed to downed power lines, contaminated and unusual debris, hazardous materials, and generally unsafe conditions. • Extended power outages and evacuations may lead to possible looting, destruction of property, and theft, further burdening law enforcement resources.
<p>Airport, Academic Institutions, Evacuation Centers & Shelters, Governmental Facilities, (5 Government Facilities, 1 University located in special flood hazard area)</p>	<ul style="list-style-type: none"> • Structures can be damaged by rising flood waters. • Power outages could disrupt critical care. • Backup power sources could be damaged, inundated or otherwise inoperable. • Critical staff may be impacted and unable to report for duty, limiting response capabilities. • Evacuations may be necessary due to extended power outages, gas line ruptures, or inundation of facilities. • Additional emergency responders and critical aid workers may not be able to reach the area for days. • Power outages and infrastructure damage may prevent larger airports from acting as temporary command centers for logistics, communications, and emergency operations. • Temporary break in operations may significantly inhibit post event evacuations. • Damaged or destroyed highway infrastructure may substantially increase the need for airport operations.
<p>Utility Services and Infrastructure (electric, water, wastewater, communications) (1 Wastewater Treatment Facility, 1 Pump Station, 1 Communication Tower, and 2 Dams located in special flood hazard area)</p>	<ul style="list-style-type: none"> • Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. • Emergency service vehicles can be damaged by rising flood waters. • Flood-related rescues may be necessary at swift and low water crossings or in flooded neighborhoods where roads have become impassable, placing emergency service workers in harm's way. • Increased number of structure fires due to gas line ruptures and downed power lines, further straining the capacity and resources of emergency personnel. • Service responders are exposed to downed power lines, contaminated and unusual debris, hazardous materials, and generally unsafe conditions. • Extended power outages and evacuations may lead to possible looting, destruction of property, and theft, further burdening law enforcement resources.

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Historic loss estimates due to flood are presented in Table 7-5 below. Considering 35 flood events over a 27.5-year period, frequency is approximately one to two events every year.

Table 7-5. Potential Annualized Losses

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Wichita County	\$169,790	\$6,174
City of Burkburnett	\$35,154,141	\$1,278,332
City of Cashion Community	\$-	\$-
City of Electra	\$0	\$0
City of Iowa Park	\$815,089	\$29,640
City of Pleasant Valley	\$10,362	\$377
City of Wichita Falls	\$6,275,670	\$228,206
TOTAL	\$42,425,053	\$1,542,729

While all citizens are at risk of the impacts of a flood, forced relocation and disaster recovery drastically impacts low-income residents who lack the financial means to travel, afford a long-term stay away from home, and to rebuild or repair their homes. An estimated 16.6 percent of the planning area's population live below the poverty level. While warning times for these type of hazard events should be substantial enough for individuals to seek shelter, individuals who work and recreate outside are also vulnerable to potential impacts of a flood event.

Table 7-6. Populations at Greatest Risk⁶

JURISDICTION	POPULATION BELOW POVERTY LEVEL
Wichita County	21,484
City of Burkburnett	1,063
City of Cashion Community	9
City of Electra	497
City of Iowa Park	524
City of Pleasant Valley	25
City of Wichita Falls	18,974

⁶ US Census Bureau American Community Survey Five-Year Estimates 2017-2021 for Wichita County planning area.

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The severity of a flooding event varies depending on the relative risk to citizens and structures located within the planning area. Table 7-7 depicts the level of impact for the Wichita County planning area, including participating jurisdictions.

Table 7-7. Impact by Jurisdiction

JURISDICTION	IMPACT	DESCRIPTION
Wichita County	Limited	While it is anticipated that Wichita County could anticipate an impact of “limited” with critical facilities shut down for a week or less, and less than 10 percent of property would be destroyed or damaged.
City of Burkburnett	Limited	It is anticipated that the City could anticipate an impact of “limited” with critical facilities shut down for a week or less, and less than 10 percent of property would be destroyed or damaged.
City of Cashion Community	Limited	It is anticipated that the City could anticipate an impact of “limited” with critical facilities shut down for a week or less, and less than 10 percent of property would be destroyed or damaged.
City of Electra	Limited	It is anticipated that the City could anticipate an impact of “limited” with critical facilities shut down for a week or less, and less than 10 percent of property would be destroyed or damaged.
City of Iowa Park	Limited	It is anticipated that the City could anticipate an impact of “limited” with critical facilities shut down for a week or less, and less than 10 percent of property would be destroyed or damaged.
City of Pleasant Valley	Limited	It is anticipated that the City could anticipate an impact of “limited” with critical facilities shut down for a week or less, and less than 10 percent of property would be destroyed or damaged.
City of Wichita Falls	Limited	It is anticipated that the City could anticipate an impact of “limited” with critical facilities shut down for a week or less, and less than 10 percent of property would be destroyed or damaged.

ASSESSMENT OF IMPACTS

Flooding is the deadliest natural disaster that occurs in the U.S. each year, and it poses a constant and significant threat to the health and safety of the people in the Wichita County planning area. The impact of climate change could produce larger, more severe flood events, exacerbating the current flood impacts. Worsening flood conditions can be frequently associated with a variety of impacts, including:

- Flood-related rescues may be necessary at swift and low water crossings or in flooded neighborhoods where roads have become impassable, placing first responders in harm’s way.
- Evacuations may be required for entire neighborhoods because of rising floodwaters, further taxing limited response capabilities, and increasing sheltering needs for displaced residents.
- Health risks and threats to residents are elevated after the flood waters have receded due to contaminated flood waters (untreated sewage and hazardous chemicals) and mold growth typical in flooded buildings and homes.

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- Significant flood events often result in widespread power outages increasing the risk to more vulnerable portions of the population who rely on power for health and / or life safety.
- Extended power outage can result in an increase in structure fires and / or carbon monoxide poisoning as individuals attempt to cook or heat their home with alternate, unsafe cooking or heating devices, such as grills.
- Floods can destroy or make residential structures uninhabitable, requiring shelter or relocation of residents in the aftermath of the event.
- First responders are exposed to downed power lines, contaminated and potentially unstable debris, hazardous materials, and generally unsafe conditions, elevating the risk of injury to first responders and potentially diminishing emergency response capabilities.
- Emergency operations and services may be significantly impacted due to damaged facilities.
- Significant flooding can result in the inability of emergency response vehicles to access areas of the community.
- Critical staff may suffer personal losses or otherwise impacted by a flood event and unable to report for duty, limiting response capabilities.
- County and City departments may be flooded, delaying response and recovery efforts for the entire community.
- Private sector entities that the jurisdiction and its residents rely on, such as utility providers, financial institutions, and medical care providers may not be fully operational and may require assistance from neighboring communities until full services can be restored.
- Damage to infrastructure may slow economic recovery since repairs may be extensive and lengthy.
- Some businesses not directly damaged by the flood may be negatively impacted while utilities are being restored or water recedes, further slowing economic recovery.
- When the community is affected by significant property damage it is anticipated that funding would be required for infrastructure repair and restoration, temporary services and facilities, overtime pay for responders, and normal day-to-day operating expenses.
- Displaced residents may not be able to immediately return to work, further slowing economic recovery.
- Residential structures substantially damaged by a flood may not be rebuilt for years and uninsured or underinsured residential structures may never be rebuilt, reducing the tax base for the community.
- Large floods may result in a dramatic population fluctuation, as people are unable to return to their homes or jobs and must seek shelter and / or work outside of the affected area.
- Businesses that are uninsured or underinsured may have difficulty reopening, which results in a net loss of jobs for the community and a potential increase in the unemployment rate.
- Flooding may cause significant disruptions of clean water and sewer services, elevating health risks and delaying recovery efforts.
- The psycho-social effects on flood victims and their families can traumatize them for long periods of time, creating long term increases in medical treatment and services.
- Extensive or repetitive flooding can lead to decreases in property value for the affected community.

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- Flood poses a potential catastrophic risk to annual and perennial crop production and overall crop quality leading to higher food costs.
- Flood related declines in production may lead to an increase in unemployment.
- Large floods may result in loss of livestock, potential increased livestock mortality due to stress and water borne disease, and increased cost for feed.
- Recreation activities may be unavailable and tourism can be unappealing for years following a large flood event, devastating directly related local businesses and negatively impacting economic recovery.
- Parks, recreational areas and nature preserves may suffer significant wildlife mortality during and following a flood due to damaged or destroyed ecosystems and water contamination.

The overall extent of damages caused by floods is dependent on the extent, depth and duration of flooding, and the velocities of flows in the flooded areas. The level of preparedness and pre-event planning done by government, businesses, and citizens will contribute to the overall economic and financial conditions in the aftermath of a flood event.

CLIMATE CHANGE CONSIDERATIONS

Significant precipitation events have caused significant flood-related damage to the Wichita County planning area, including participating jurisdictions. River flooding in Texas is projected to have no substantial change through 2036. This is in large part due to the construction of dams and reservoirs for flood management in the 20th century. There is a mixture of historical trends categorized by season, with no one clear trend to project. In addition, meteorological drivers of river flooding (increased rainfall intensity, decreased soil moisture) are projected to have competing influences. On balance, if an increasing trend is present in river flooding, it will be at the most extreme flood events or in the wettest parts of the state where there is so much rainfall that a decrease in soil moisture would have little mitigating impact.⁷

Future projections show a slight increase in the amount of precipitation falling in the wettest 3-day event for the planning area in the coming 20-year period.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) PARTICIPATION

Flood insurance offered through the National Flood Insurance Program (NFIP) is one of the best ways for home and business owners to protect themselves financially against the flood hazard. Wichita County and all participating jurisdictions, except the City of Cashion Community, are currently participating in the NFIP and are in good standing. The City of Cashion Community currently has no development in the floodplain and does not have the capacity to administer the NFIP program. All NFIP participating communities in the planning area currently have in place the minimum NFIP standards but are considering adopting additional higher regulatory standards to limit floodplain development.

⁷ Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, Texas A&M University Office of the Texas State Climatologist, 2021 update.

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The flood hazard areas throughout the planning area are subject to periodic inundation, which may result in loss of life and property, health and safety hazards, disruption of commerce and governmental services, and extraordinary public expenditures for flood protection and relief, of which adversely affect public safety.

These flood losses are created by the cumulative effect of obstructions in floodplains which cause an increase in flood heights and velocities, and by the occupancy of flood hazard areas by uses vulnerable to floods and hazardous to other lands because they are inadequately elevated, flood-proofed or otherwise protected from flood damage. Mitigation actions are included to address flood maintenance issues as well, including routinely clearing debris from drainage systems and bridges and expanding drainage culverts and storm water structures to more adequately convey flood waters.

It is the purpose of Wichita County and the participating jurisdictions to continue to promote the public health, safety and general welfare by minimizing public and private losses due to flood conditions in specific areas. All participating communities in the planning area are guided by their local Flood Damage Prevention Ordinance. The County and participating jurisdictions will continue to comply with NFIP requirements through local permitting, inspection, and record-keeping requirements for new and substantially developed construction. Further, the NFIP program promotes sound development in floodplain areas and includes provisions designed to:

- Protect human life and health;
- Minimize expenditure of public money for costly flood control projects;
- Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- Minimize prolonged business interruptions;
- Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, and bridges located in floodplains;
- Help maintain a stable tax base by providing for the sound use and development of flood-prone areas in such a manner as to minimize future flood blight areas; and
- Ensure that potential buyers are notified that property is in a flood area.

In order to accomplish these tasks, Wichita County and the participating jurisdictions seek to follow these guidelines to achieve flood mitigation by:

- Restrict or prohibit uses that are dangerous to health, safety, or property in times of flood, such as filling or dumping, that may cause excessive increases in flood heights and / or velocities;
- Require that uses vulnerable to floods, including facilities, which serve such uses, be protected against flood damage at the time of initial construction as a method of reducing flood losses;
- Control the alteration of natural floodplains, stream channels, and natural protective barriers, which are involved in the accommodation of floodwaters;
- Control filling, grading, dredging, and other development, which may increase flood damage; and
- Prevent or regulate the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards to other lands.

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NFIP COMPLIANCE AND MAINTENANCE

All NFIP participating jurisdictions have developed mitigation actions that relate to either NFIP maintenance or compliance. Compliance and maintenance actions can be found in Section 18.

Flooding was identified as a high-risk hazard during hazard ranking activities at the Risk Assessment Workshop by the vast majority of the planning team. As such, many of the mitigation actions were developed with flood mitigation in mind. A majority of these flood actions address compliance with the NFIP and implementing flood awareness programs. All participating jurisdictions recognize the need and are working towards adopting higher NFIP regulatory standards to further minimize flood risk in their community. In addition, each jurisdiction is focusing on public flood awareness activities. This includes promoting the availability of flood insurance by placing NFIP brochures and flyers in public libraries or public meeting places in participating jurisdictions.

Each NFIP participating jurisdiction has a designated floodplain administrator (Table 7-8). The floodplain administrator in the planning area will continue to maintain compliance with the NFIP including continued floodplain administration, zoning ordinances, and development regulation. The floodplain ordinance adopted by participating jurisdictions outlines the requirements for development in special flood hazard areas.

Table 7-8. Floodplain Administrators

JURISDICTION	TITLE	PERMIT AUTHORITY
Wichita County	Emergency Management Coordinator / Floodplain Administrator	Yes ⁸
City of Burkburnett	Planning and Zoning Director / Floodplain Administrator	Yes
City of Cashion Community	Not Participating	No ⁹
City of Electra	Fire Marshal / Floodplain Administrator	Yes
City of Iowa Park	City Manager / Floodplain Administrator	Yes
City of Pleasant Valley	City Secretary / Floodplain Administrator	Yes
City of Wichita Falls	Stormwater Manager / Floodplain Administrator	Yes

In accordance with local flood damage prevention ordinances, each floodplain administrator responsibilities include:

- Permitting and inspecting construction activity in the floodplain;
- Ensuring conformance with floodplain permit requirements;
- Enforcing floodplain regulations;

⁸ Wichita County enforces and permits the County floodplain ordinance for all ETJ with the exception of the City of Iowa Park who enforces and permits their floodplain ordinance for their own ETJ.

⁹ Wichita County is in an agreement to enforce the County floodplain ordinance for the City of Cashion Community.

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- Identifying Substantially Damaged structures and ensuring compliance during reconstruction;
- Identifying Substantial Improvements in proposed development permit applications and ensuring compliance;
- Providing floodplain map and flood insurance information to the public;
- Coordinating with FEMA to maintain the community's participation in the NFIP; and
- Keeping records of construction in the floodplain.

Each jurisdiction's flood damage prevention ordinance includes standard language defining substantial damage and substantial improvement using the minimum required threshold of fifty percent of market value.

REPETITIVE LOSS

The Severe Repetitive Loss (SRL) Grant Program under FEMA provides federal funding to assist states and communities in implementing mitigation measures to reduce or eliminate the long-term risk of flood damage to severe repetitive loss residential structures insured under the NFIP. The Texas Water Development Board (TWDB) administers the SRL grant program for the State of Texas. One of the goals of the FMA program is to reduce the burden of repetitive loss and severe repetitive loss properties on the NFIP through mitigation activities that significantly reduce or eliminate the threat of future flood damages.

Repetitive Loss properties are defined as structures that are:

- Any insurable building for which 2 or more claims of more than \$1,000 each, paid by the National Flood Insurance Program (NFIP) within any 10-year period, since 1978;
- May or may not be currently insured under the NFIP.

Severe Repetitive Loss properties are defined as residential properties that are:

- Covered under the NFIP and have at least four flood related damage claim payments (building and contents) over \$5,000.00 each, and the cumulative amount of such claims payments exceed \$20,000; or
- At least two separate claim payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

In either scenario, at least two of the referenced claims must have occurred within any ten-year period and must be greater than 10 days apart.¹⁰ Table 7-9 shows repetitive loss and severe repetitive loss properties for the Wichita County planning area. It is noted that the Cities of Burkburnett, Cashion Community, Electra, and Iowa Park do not currently have repetitive loss properties.

¹⁰ Source: Texas Water Development Board

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Table 7-9. Repetitive Loss and Severe Repetitive Loss Properties

JURISDICTION	BUILDING TYPE ¹¹	NUMBER OF STRUCTURES	NUMBER OF LOSSES
Wichita County	Single Family	8	17
City of Pleasant Valley	Single Family	1	2
City of Wichita Falls	Single Family	124	441
	2-4 Family	8	19
	Other Residential	17	48
	Assumed Condo	2	9
	Non-Residential	12	39

¹¹ Some buildings are assumed to be single family.



SECTION 8 HAIL

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HAZARD DESCRIPTION



Hailstorm events are a potentially damaging outgrowth of severe thunderstorms. During the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to the rapid rising of warm air into the upper atmosphere, and the subsequent cooling of the air mass. Frozen droplets gradually accumulate into ice crystals until they fall as precipitation that is round or irregularly shaped masses of ice typically 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 are required to keep hail in suspension in thunderclouds. The strength of the updraft is a by-product of heating on the Earth's surface. Higher temperature gradients above Earth's surface result in increased suspension time and hailstone size.

According to the National Insurance Crime Bureau (NICB), between 2018 and 2020 the State of Texas had the greatest number of hail loss claims in the United States with 605,866 loss claims (23 percent of total hail claims in the U.S.) due to hail events. In this two-year period Texas experienced a total of 584 severe hail days.

In 2021, 6.8 million properties in the U.S. experienced one or more damaging hail events, resulting in a total of \$16.5 billion in insured losses. Texas had the highest number of properties affected by hail with over 1.5 million properties or 17 percent of total properties in the state affected; an increase of 80,000 properties affected between 2020 and 2021. Texas hailstorms accounted for almost a quarter of total U.S. properties affected by hail in 2021.

LOCATION

Hailstorms are an extension of severe thunderstorms that could potentially cause severe damage. As a result, they are not confined to any specific geographic location and can vary greatly in size, location, intensity, and duration. Therefore, the entire Wichita County planning area, including all participating jurisdictions, is equally at risk of hail events. Refer to Figure 8-1 for the location of past hail events in the planning area.

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EXTENT

The National Weather Service (NWS) classifies a storm as “severe” if there is hail three-quarters of an inch in diameter (approximately the size of a penny) or greater, based on radar intensity or as seen by observers. The intensity category of a hailstorm depends on hail size and the potential damage it could cause, as depicted in the National Centers for Environmental Information (NCEI) Intensity Scale in Table 8-1.

Table 8-1. Hail Intensity and Magnitude¹

SIZE CODE	INTENSITY CATEGORY	SIZE (Diameter Inches)	DESCRIPTIVE TERM	TYPICAL DAMAGE
H0	Hard Hail	Up to 0.33	Pea	No damage
H1	Potentially Damaging	0.33 – 0.60	Marble	Slight damage to plants and crops
H2	Potentially Damaging	0.60 – 0.80	Dime	Significant damage to plants and 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
H10	Super Hailstorms	4.0 +	Baseball	Extensive structural damage, could cause fatal injuries

The intensity scale in Table 8-1 ranges from H0 to H10, with increments of intensity or damage potential in relation to hail size (distribution and maximum), texture, fall speed, speed of storm translation, and strength of the accompanying wind. Based on the best available data regarding the previous occurrences for the area, the Wichita County planning area, including participating jurisdictions, may experience hailstorms ranging from an H0 (pea size) to an H10 (baseball). The

¹ NCEI Intensity Scale, based on the TORRO Hailstorm Intensity Scale.

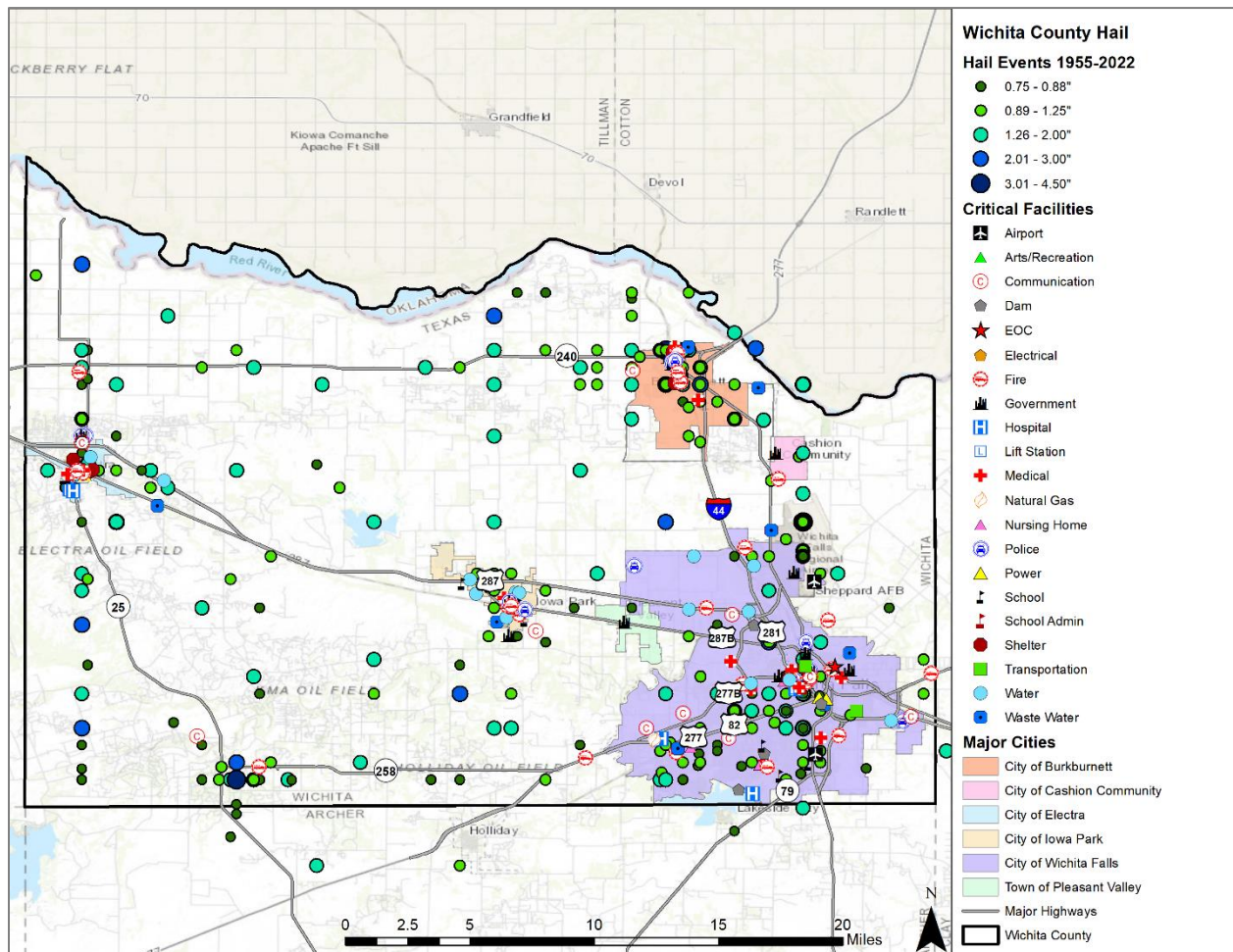
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largest hail event in the Wichita County planning area occurred on May 22, 2020 in the City of Burkburnett, and resulted in hail measuring 5 inches in diameter, or an H10, which is considered a super hailstorm that can cause extensive damages to structures and fatal injuries. This is likely the greatest extent the Wichita County planning area, including all participating jurisdictions, can anticipate in the future: H10 hail.

HISTORICAL OCCURRENCES

Historical evidence shown in Figure 8-1 demonstrates that the planning area is vulnerable to hail events overall. Historical events with reported damages, injuries, or fatalities are shown in Table 8-2. A total of 676 reported historical hail events impacted the Wichita County planning area, including all participating jurisdictions, from January 1955 through June 2023; these events were reported to NCEI and National Oceanic Atmospheric Administration (NOAA) databases and may not represent all hail events to have occurred during the past 68.5 years. Only those events for the planning area with latitude and longitude available were plotted (Figure 8-1).

Figure 8-1. Spatial Historical Hail Events, 1955-2023²



² Events are reported from January 1955 through June 2023

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Table 8-2. Historical Hail Events, 1955-2023³

LOCATION	DATE	MAGNITUDE (inches)	DEATH	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
City of Iowa Park	3/29/1993	1.75	0	0	\$10,724	\$0
Wichita County	6/9/1998	2	0	2	\$1,889,680	\$0
City of Wichita Falls	5/27/2000	1.75	0	0	\$449,005	\$0
City of Wichita Falls	5/27/2000	1.25	0	0	\$1,077,614	\$0
City of Burkburnett	4/13/2002	1.75	0	0	\$34,262	\$0
City of Wichita Falls	5/8/2005	1.25	0	0	\$15,844	\$0
City of Electra	5/19/2018	1.5	0	0	\$1,224	\$0
Total		(MAX EXTENT)	0	2	\$3,478,354	\$0

Table 8-3. Historical Hail Events Summary, 1955-2023

LOCATION	NUMBER OF EVENTS	MAGNITUDE (inches)	DEATH	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Wichita County	271	4.5	0	2	\$1,889,680	\$0
City of Burkburnett	102	5.0	0	0	\$34,262	\$0
City of Cashion Community	3	1.75	0	0	\$0	\$0
City of Electra	83	2.75	0	0	\$1,224	\$0
City of Iowa Park	29	2.5	0	0	\$10,724	\$0
City of Pleasant Valley	12	1.5	0	0	\$0	\$0
City of Wichita Falls	176	2.75	0	0	\$1,542,464	\$0
Total	676	(MAX EXTENT)	0	2	\$3,478,354	\$0

Based on the list of historical hail events for the Wichita County planning area (listed above), 96 events have occurred since the 2018 Plan according to reports in the NCEI database. The most significant historical events in relation to damages occurred in June of 1998 and May of 2000, with these events reporting over one million dollars in damages in Wichita County and the City

³ Only recorded events with injuries and damages are listed. No reports of fatalities were recorded in the NCEI database. Events are reported from January 1955 through June 2023. Damages are reported in 2023 dollars.

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of Wichita Falls. Most reported events throughout the reporting period occurred in the county and the City of Wichita Falls, followed by 102 events reported for the City of Burkburnett.

SIGNIFICANT EVENTS

May 22, 2020 – City of Burkburnett

Numerous severe thunderstorms occurred within the area causing very large hail, some reported greater than 5 inches in diameter, along with damaging wind, flooding, and a few tornadoes that were reported. Within the City of Burkburnett, there were reports of hail measuring over 5 inches in diameter. Damage estimates were not available for this event.

May 29, 2012 – Wichita County

Isolated supercells developed during the late afternoon along a dryline across western Texas. The storms drifted southward across Wichita and Archer counties delivering large hail and wind damage. Wichita County reported hail measuring 4 inches in diameter from this storm system. Damage estimates were not available for this event.

May 27, 2000 – City of Wichita Falls

Severe thunderstorms formed across portions of western North Texas. These storms resulted in areas of significant hail damage (hail reported 1.75 inches in diameter within Wichita County) and 2 tornadoes. Hundreds of insurance claims were filed across Wichita, Archer, and Clay Counties with approximately 300 claims near the southwest side of the City of Wichita Falls. Damages from this event were estimated at \$1,112,252 (2023 dollars) for the planning area. In addition, insurance claims indicated approximately \$449,005 (2023 dollars) in hail damage claims.

June 9, 1998 – Wichita County

Severe thunderstorms moved from the western portion of the State into North Texas producing large hail and damaging thunderstorm winds. The largest hail (up to the size of baseballs) was reported north of the City of Electra. A severe thunderstorm with winds up to 76 mph affected Sheppard Air Force Base in Wichita County, causing extensive damage to many of the buildings and an aircraft, in addition to over 100 vehicles reported with damages as a result of hail. Two soldiers were also injured by large hail. Total damages as a result were reported to be approximately \$1,889,680 (2023 dollars).

PROBABILITY OF FUTURE EVENTS

Based on available records of historic events, 676 events in a 68.5-year reporting period for Wichita County planning area provides an estimated annual occurrence of nine to ten events per year. This frequency supports a highly likely probability of future events for the planning area, including all participating jurisdictions. See additional information on climate change at the end of this section.

VULNERABILITY AND IMPACT

Much of the damage inflicted by hail is to crops. Even relatively small hail can shred plants to ribbons in a matter of minutes. Vehicles, roofs of buildings and homes, and landscaping are most commonly damaged by hail.

Utility systems on roofs of buildings and critical facilities would be vulnerable and could be damaged. Hail can pose a significant threat to people as they could be struck by hail and falling trees and branches. Outdoor activities and events may elevate the risk to residents and visitors

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when a hailstorm strikes with little warning. Portable buildings typically utilized by schools and commercial sites such as construction areas would be more vulnerable to hail events than the typical site-built structures.

The Wichita County planning area features mobile or manufactured home parks throughout the planning area. These parks are typically more vulnerable to hail events than typical site-built structures. In addition, manufactured homes are located sporadically throughout the planning area including all participating jurisdictions which would also be more vulnerable. The U.S. Census data indicates a total of 2,383 (4.3 percent of total housing stock) manufactured homes located in the Wichita County planning area. In addition, 66.1 percent (approximately 36,727 structures) of the housing structures in the planning area were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damage during significant hail events.

Table 8-4. Structures at Greater Risk to Hail Events

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Wichita County	2,383	36,727
City of Burkburnett	558	3,445
City of Cashion Community	26	79
City of Electra	102	1,097
City of Iowa Park	152	1,857
City of Pleasant Valley	16	78
City of Wichita Falls	1,180	28,742

While all citizens are at risk to the impacts of a hail event, forced relocation and disaster recovery drastically impacts low-income residents who lack the financial means to travel, afford a long-term stay away from home, and to rebuild or repair their homes. An estimated 16.6 percent of the planning area's population live below the poverty level (Table 8-5). While warning times for this type of hazard event should be substantial enough for these individuals to seek shelter, individuals who work and recreate outside are also vulnerable to potential impacts of a hail event.

Table 8-5. Populations at Greater Risk to Hail Events

JURISDICTION	POPULATION BELOW POVERTY LEVEL ⁴
Wichita County	21,484
City of Burkburnett	1,063
City of Cashion Community	9

⁴ US Census Bureau 2021 data for Wichita County.

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JURISDICTION	POPULATION BELOW POVERTY LEVEL ⁴
City of Electra	497
City of Iowa Park	524
City of Pleasant Valley	25
City of Wichita Falls	18,974

The Wichita County Planning Team identified the following critical facilities as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by hail events. The following critical facilities would be vulnerable to hail events in the Wichita County planning area, including participating jurisdictions. For a comprehensive list by participating jurisdiction please see Appendix C.

Table 8-6. Critical Facilities Vulnerable to Hail

CRITICAL FACILITIES	POTENTIAL IMPACTS
Emergency Response Departments (EOC, Fire, Police, EMS), Hospitals	<ul style="list-style-type: none"> Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. Emergency vehicles can be damaged by hailstones. Power outages could disrupt communications, delaying emergency response times. Accumulated hail on the streets may impede emergency response vehicle access to areas. Extended power outages and evacuations may lead to possible looting, destruction of property, and theft, further burdening law enforcement resources.
Airport, Academic Institutions, Evacuation Centers & Shelters, Governmental Facilities	<ul style="list-style-type: none"> Structures can be damaged by hailstones. Power outages could disrupt critical care. Backup power sources could be damaged. Evacuations may be necessary due to extended power outages, gas line ruptures, or structural damage to facilities. Power outages and infrastructure damage may prevent larger airports from acting as temporary command centers for logistics, communications, and emergency operations. Temporary break in operations may significantly inhibit post event evacuations. Damaged or destroyed highway infrastructure may substantially increase the need for airport operations. Economic disruption due to power outages and fires negatively impact airport services as well as area businesses reliant on airport operations.
Utility Services and Infrastructure (electric, water,	<ul style="list-style-type: none"> Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. Emergency vehicles can be damaged by hailstones.

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CRITICAL FACILITIES	POTENTIAL IMPACTS
wastewater, communications)	<ul style="list-style-type: none"> Power outages could disrupt communications, delaying emergency response times. Accumulated hail on the streets may impede emergency response vehicle access to areas. Extended power outages and evacuations may lead to possible looting, destruction of property, and theft, further burdening law enforcement resources.

Hail has been known to cause injury to humans and occasionally has been fatal, though no deaths have been recorded in the planning area. Overall, the average loss estimate of property and crops in the planning area is considered \$3,478,354 with an average annualized loss of \$50,779. Based on historic loss and damages, the impact of hail damages on the Wichita County planning area, including all participating jurisdictions, can be considered “Limited” severity of impact, meaning minor quality of life lost, critical facilities and services shut down for 24 hours or less, and less than 10 percent of property destroyed or with major damage.

Table 8-7. Estimated Annualized Losses by Participating Jurisdiction

JURISDICTION	TOTAL PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Wichita County	\$1,889,680	\$27,587
City of Burkburnett	\$34,262	\$500
City of Cashion Community	\$0	\$0
City of Electra	\$1,224	\$18
City of Iowa Park	\$10,724	\$157
City of Pleasant Valley	\$0	\$0
City of Wichita Falls	\$1,542,464	\$22,518
Total	\$3,478,354	\$50,779

ASSESSMENT OF IMPACTS

Hail events have the potential to pose a significant risk to people and can create dangerous situations. Hail conditions can be frequently associated with a variety of impacts, including:

- Hail may create hazardous road conditions during and immediately following an event, delaying first responders from providing for or preserving public health and safety.
- Individuals and first responders who are exposed to the storm may be struck by hail, falling branches, or downed trees resulting in injuries or possible fatalities.
- Residential structures can be damaged by falling branches, which can result in physical harm to occupants.

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- Large hail events will likely cause extensive roof damage to residential structures along with siding damage and broken windows, creating a spike in insurance claims and a rise in premiums.
- Automobile damage may be extensive depending on the size of the hail and length of the storm.
- Hail events can result in power outages over widespread areas increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.
- Extended power outage can result in an increase in structure fires and/or carbon monoxide poisoning, as individuals attempt to cook or heat their home with alternate, unsafe cooking or heating devices, such as grills.
- First responders are exposed to downed power lines, damaged structures, hazardous spills, and debris that often accompany hail events, elevating the risk of injury to first responders and potentially diminishing emergency response capabilities.
- Downed power lines and large debris, such as downed trees, can result in the inability of emergency response vehicles to access areas of the community.
- Hazardous road conditions may prevent critical staff from reporting for duty, limiting response capabilities.
- Economic disruption negatively impacts the programs and services provided by the community due to short- and long-term loss in revenue.
- Some businesses not directly damaged by the hail event may be negatively impacted while roads are cleared and utilities are being restored, further slowing economic recovery.
- Businesses that are more reliant on utility infrastructure than others may suffer greater damage without a backup power source.
- Hazardous road conditions will likely lead to increases in automobile accidents, further straining emergency response capabilities.
- Depending on the severity and scale of damage caused by large hail events, damage to power transmission and distribution infrastructure can require days or weeks to repair.
- A significant hail event could significantly damage agricultural crops, resulting in extensive economic losses for the community and surrounding area.
- Hail events may injure or kill livestock and wildlife, especially endangered species within the River Bend Nature Center.
- A large hail event could impact the accessibility of recreational areas and parks due to extended power outages or debris clogged access roads.
- Historical sites and properties, a total of 13 sites within Wichita County, are listed on the National Register of Historic Places and are at a higher risk of impact.

The economic and financial impacts of hail will depend entirely on the scale of the event, what is damaged, and how quickly repairs to critical components of the economy can be implemented. The level of preparedness and pre-event planning conducted by the community, local businesses, and citizens will contribute to the overall economic and financial conditions in the aftermath of any hail event.

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CLIMATE CHANGE CONSIDERATIONS

While the impact of climate change on the frequency and severity hailstorm events is unclear, the increase of warmer temperatures will likely lead to less hail events during the summer months but is expected to increase the risk of large hailstones during the spring season.⁵

⁵ Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, Texas A&M University Office of the Texas State Climatologist, 2021 update.



SECTION 9 LIGHTNING

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HAZARD DESCRIPTION

Lightning is a discharge of electrical energy resulting from the buildup of positive and negative charges within a thunderstorm, creating a “bolt” when the buildup of charges becomes strong enough. This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning can reach temperatures approaching 50,000 degrees Fahrenheit. Lightning rapidly heats the sky as it flashes but the surrounding air cools following the bolt. This rapid heating and cooling of the surrounding air causes the thunder which often accompanies lightning strikes. While most often affiliated with severe thunderstorms, lightning often strikes outside of heavy rain and might occur as far as 10 miles away from any rainfall.

According to the National Weather Service (NWS), the 10-year (2012–2021) average for fatalities is 23 people with an average of 300 injuries in the United States each year by lightning. Lightning can occur as cloud-to-ground flashes or as intra-cloud lightning flashes. Direct lightning strikes can cause significant damage to buildings, critical facilities, infrastructure, and communication equipment affecting emergency response. Lightning is also responsible for igniting wildfires that can result in widespread damages to property before firefighters have the ability to contain and suppress the resultant fire.

LOCATION

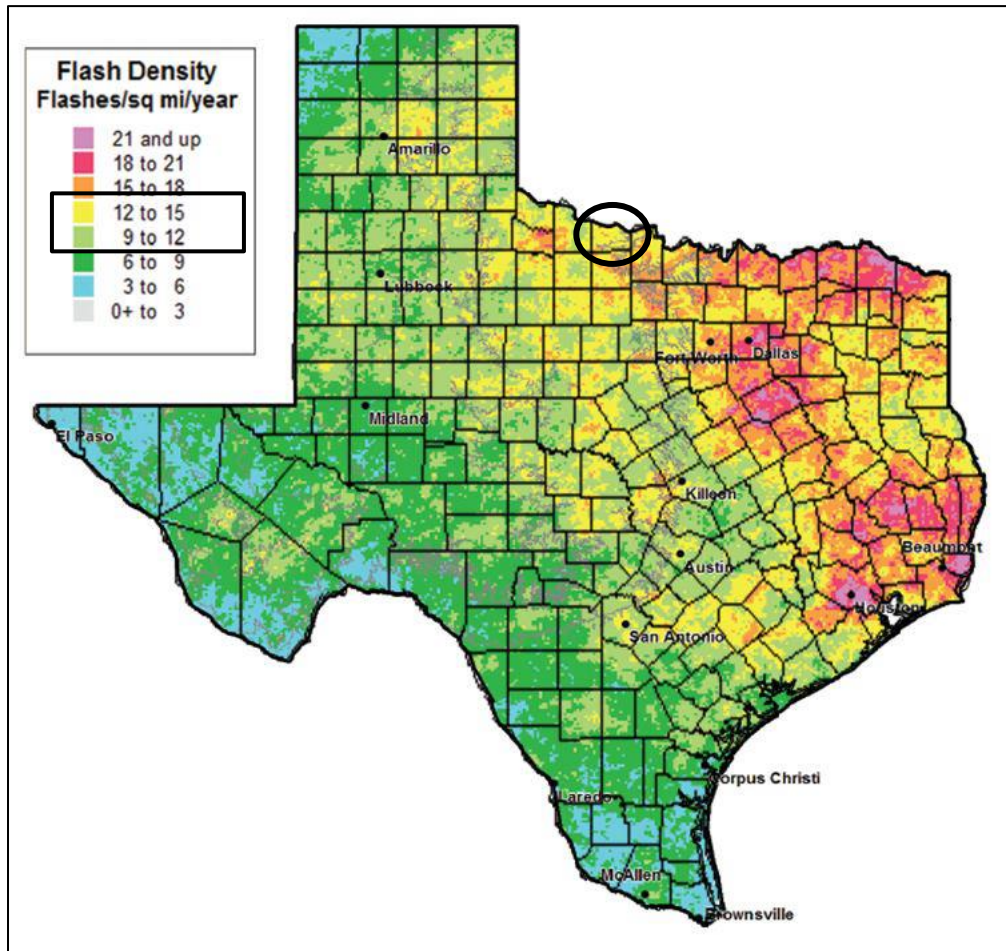
Lightning can strike in any geographic location and is considered a common occurrence in Texas. The Wichita County planning area, including participating jurisdictions, is in a region of the state that is moderately susceptible to a lightning strike. Therefore, lightning could occur at any location within the entire planning area. It is assumed that the entire Wichita County planning area is uniformly exposed to the threat of lightning.

EXTENT

According to the National Oceanic and Atmospheric Administration (NOAA), the average number of cloud-to-ground flashes for the State of Texas between 2006 and 2016 was 11.3 flashes per square mile. Vaisala’s U.S. National Lightning Detection Network lightning flash density map (Figure 9-1) shows a range of nine to fifteen cloud-to-ground lightning flashes per square mile per year for the entire Wichita County planning area. This rate equates to approximately 5,652 to 9,420 flashes per year for the entire planning area.

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Figure 9-1. Lightning Flash Density, 2006-2016



The extent for lightning can be expressed in terms of the number of strikes in an interval. NOAA utilizes lightning activity levels (LALs) on a scale from 1 to 6. LAL rankings reflect the frequency of cloud-to-ground lightning either forecast or observed (Table 9-1).

Table 9-1. NOAA Lightning Activity Levels (LAL)

LAL	CLOUD & STORM DEVELOPMENT	LIGHTNING STRIKES / 15 MIN
1	No thunderstorms.	-
2	Cumulus clouds are common but only a few reach 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

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LAL	CLOUD & STORM DEVELOPMENT	LIGHTNING STRIKES / 15 MIN
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.	

The National Centers for Environmental Information (NCEI) does not include the LAL for historical lightning events, therefore in order to determine the extent of lightning strikes, the yearly average range of estimated number of lightning strikes within the planning area (5,652 to 9,420 flashes) and a cloud-to-ground flash density of nine to fifteen strikes per square mile were divided by the number¹ of thunderstorm events that occur annually in the planning area. Wichita County, including participating jurisdictions, should expect an average range of three to five lightning strikes within 15 minutes at any given time during a lightning or combined lightning and thunderstorm event, indicating lightning strikes have an average LAL range of 1 to 2. The highest being a level 2 on the LAL that all participating jurisdictions may anticipate in the future.

HISTORICAL OCCURRENCES

Between 1996 and June 2023, there have been 10 recorded events for the Wichita County planning area. It is highly likely multiple lightning occurrences have gone unreported before and during the reporting period. The NCEI is a national data source and is considered a reliable resource for hazards. However, the flash density for the planning area, along with input from local team members, indicates regular lightning occurrences that simply have not been reported.

Table 9-2 Historical Lightning Events, 1996- 2023²

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGES	CROPS DAMAGES
Wichita County	6/10/1996	0	0	\$98,283	\$0
City of Burkburnett	7/13/1998	0	1	\$5,662	\$0
City of Burkburnett	9/22/1998	0	0	\$5,648	\$0
City of Wichita Falls	6/10/1996	0	0	\$1,474,136	\$0
City of Wichita Falls	7/22/1997	0	0	\$47,978	\$0

¹ Analysis includes the highest number of events recorded in a given year during the reporting period in order to account for typical under reporting of thunderstorm and lightning events.

² Events reported from January 1996 through June 2023. Damages are reported in 2023 dollars.

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JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGES	CROPS DAMAGES
City of Wichita Falls	7/22/1997	0	0	\$13,934	\$0
City of Wichita Falls	6/9/1998	0	0	\$1,890	\$0
City of Wichita Falls	9/19/1999	0	0	\$3,669	\$0
City of Wichita Falls	5/19/2001	0	0	\$520	\$0
City of Wichita Falls	5/21/2007	0	0	\$1,481	\$0
TOTALS		0	1	\$1,653,201	\$0

Table 9-3. Summary of Historical Lightning Events, 1996-2023

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Wichita County	1	0	0	\$98,283	\$0
City of Burkburnett	2	0	1	\$11,310	\$0
City of Cashion Community	0	-	-	-	-
City of Electra	0	-	-	-	-
City of Iowa Park	0	-	-	-	-
City of Pleasant Valley	0	-	-	-	-
City of Wichita Falls	7	0	0	\$1,543,608	\$0
TOTAL LOSSES	10	0	1	\$1,653,201	

In summary, between January 1996 and June 2023, the City of Wichita Falls experienced the greatest number of lightning events (7) followed by the City of Burkburnett (2) and Wichita County (1). The City of Burkburnett was the only jurisdiction with a reported injury from a lightning event, based on the NCEI. The remaining participating jurisdictions did not have lightning events or impacts reported to the NCEI database during the reporting period. Based on the list of historical lightning events for the Wichita County planning area (listed above), including all participating jurisdictions, no reported events have occurred since the 2018 Plan.

SIGNIFICANT EVENTS

July 13, 1998 – City of Burkburnett

Several severe thunderstorms developed over western portions of North Texas, causing minor residential damages and down trees and telephone poles. The event caused one injury to a man at a local gas station as he was standing near a utility pole as it was struck by lightning. In addition,

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it was reported that a structural fire occurred due to the residence being struck by lightning. Total damage costs were considered minimal with estimated losses at \$5,662 (2023 dollars).

June 10, 1996 – City of Wichita Falls

Lightning struck a house and caused fire damage to the roof and garage. It was not reported if the house was a total loss, however damages were estimated to be \$1,474,136 (2023 dollars) from this event. In Kamay, an unincorporated community in Wichita County, lightning also struck a home that resulted in a housefire. Damages from this event are estimated to be \$98,283 (2023 dollars).

PROBABILITY OF FUTURE EVENTS

Based on historical records and input from the planning team the probability of occurrence for future lightning events in the Wichita County planning area, including participating jurisdictions, is considered highly likely, or an event probable in the next year. The planning team stated that lightning occurs regularly in the area. According to NOAA, the Wichita County planning area is located in an area of the country that experiences nine to fifteen lightning flashes per square mile per year (approximately 5,652 to 9,430 flashes per year). Given this estimated probability of events, it can be expected that future lightning events will continue to threaten life and cause minor property damage throughout the planning area, including participating jurisdictions. Impacts of climate change are not expected to increase the average frequency of lightning events but may lead to an increase in the intensity of events when they do occur. See additional information on climate change and potential impacts to frequency of events at the end of this section.

VULNERABILITY AND IMPACT

Vulnerability is difficult to evaluate since lightning events can occur at different strength levels, in random locations, and can create a broad range of damage depending on the strike location. Due to the randomness of these events, all existing and future structures and facilities in the Wichita County planning area, including within participating jurisdictions, could potentially be impacted and remain vulnerable to possible injury and property loss from lightning strikes. The Wichita County planning area has 10 reported lightning events per the NCEI, however the county, including participating jurisdictions, are vulnerable and could be impacted by lightning.

The direct and indirect losses associated with these events include injury and loss of life, damage to structures and infrastructure, agricultural losses, structural fires and wildfires, utility failure (power outages), and stress on community resources. The entire population of the Wichita County planning area, including participating jurisdictions, are considered exposed to the lightning hazard. The peak lightning season in the State of Texas is from June to August; however, most fatalities occur in July. Fatalities occur most often when people are outdoors and / or participating in some form of recreation. Populations located outdoors are considered at risk and more vulnerable to lightning strikes compared to those inside a structure. Moving to a lower risk location, such as indoors, will decrease a person's vulnerability.

While all citizens are at risk to the impacts of lightning, forced relocation and disaster recovery disproportionately impacts low-income residents who lack the financial means to travel, afford a long-term stay away from home, and to rebuild or repair their homes. An estimated 16.6 percent of the planning area population live below the poverty level (Table 9-4).

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Table 9-4. Populations at Greatest Risk by Jurisdiction³

JURISDICTION	POPULATION BELOW POVERTY LEVEL
Wichita County	21,484
City of Burkburnett	1,063
City of Cashion Community	9
City of Electra	497
City of Iowa Park	524
City of Pleasant Valley	25
City of Wichita Falls	18,974

The Wichita County Planning Team identified the following critical facilities as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by lightning events. For a comprehensive list of critical facilities identified by each participating entity please see Appendix C.

Table 11-6. Critical Facilities Vulnerable to Lightning Events

CRITICAL FACILITIES	POTENTIAL IMPACTS
Emergency Response Departments (EOC, Fire, Police, EMS), Hospitals	<ul style="list-style-type: none">• Emergency operations and services may be significantly impacted due to power outages, damaged facilities, fires and/or loss of communications as a result of lightning strikes.• Emergency vehicles, including critical equipment, can be damaged by lightning strikes or by falling trees damaged by lightning.• Power outages could disrupt communications, delaying emergency response times.• Downed trees due to lightning strikes can impede emergency response vehicle access to areas.• Lightning strikes can be associated with structure fires and wildfires, further straining the capacity and resources of emergency personnel.• Extended power outages may lead to possible looting, destruction of property, and theft, further burdening law enforcement resources.
Airport, Academic Institutions, Evacuation Centers & Shelters, Governmental Facilities	<ul style="list-style-type: none">• Structures can be damaged by falling trees damaged by lightning.• Power outages could disrupt critical care.• Backup power sources could be damaged.• Evacuations may be necessary due to extended power outages, fires, or other associated damages to facilities.

³ US Census Bureau, American Community Survey Five-Year Estimates, 2021 data for Wichita County.

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CRITICAL FACILITIES	POTENTIAL IMPACTS
Utility Services and Infrastructure (electric, water, wastewater, communications)	<ul style="list-style-type: none"> Emergency operations and critical services may be significantly impacted due to power outages, damaged facilities, fires and/or loss of communications as a result of lightning strikes. Emergency vehicles, including critical equipment, can be damaged by lightning strikes or by falling trees damaged by lightning. Power outages could disrupt communications, delaying emergency response times. Downed trees due to lightning strikes can impede emergency response vehicle access to areas. Lightning strikes can be associated with structure fires and wildfires, further straining the capacity and resources of emergency personnel. Extended power outages may lead to possible looting, destruction of property, and theft, further burdening law enforcement resources.

The total estimated losses due to lightning events is \$1,653,201 (in 2023 dollars), having an approximate average annual loss estimate of \$60,116. Impact of lightning experienced in the Wichita County planning area has resulted in one injury and no fatalities. The best available data and the historic impacts indicate a “Limited” severity of impact, meaning injuries and/or illnesses are treatable with first aid, shutdown of facilities and services for less than 24 hours, and less than 10 percent of property is destroyed or with major damage.

Table 9-6. Potential Annualized Losses by Jurisdiction⁴

JURISDICTION	TOTAL PROPERTY & CROP LOSS	AVERAGE ANNUAL LOSS ESTIMATE
Wichita County	\$98,283	\$3,574
City of Burkburnett	\$11,310	\$411
City of Cashion Community	\$-	\$-
City of Electra	\$-	\$-
City of Iowa Park	\$-	\$-
City of Pleasant Valley	\$-	\$-
City of Wichita Falls	\$1,543,608	\$56,131
PLANNING AREA	\$1,653,201	\$60,116

ASSESSMENT OF IMPACTS

Lightning events have the potential to pose a significant risk to people and can create dangerous and difficult situations for public health and safety officials. Additional impacts to the planning area can include:

⁴ Damage values are in 2023 dollars.

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- Lightning events could impact recreational activities, placing residents and visitors in imminent danger, potentially requiring emergency services or evacuation.
- Older structures built to less stringent building codes may suffer greater damage from a lightning strike as they are typically built with less fire-resistant materials and often lack any fire mitigation measures such as sprinkler systems. 66 percent of homes in the county were built before 1980. With Wichita County, 13 buildings and sites are on the National Register of Historic Places, many of similarly lack fire mitigation materials or measures.
- Vegetation in urban parks may be destroyed by lightning-caused brush fires, impacting air quality and public health.
- Individuals exposed to the storm can be directly struck, posing significant health risks and potential death.
- Structures can be damaged or crushed by falling trees damaged by lightning, which can result in physical harm to the occupants.
- Lightning strikes can result in widespread power outages increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.
- Extended power outage often results in an increase in structure fires and carbon monoxide poisoning as individuals attempt to cook or heat their homes with alternate, unsafe cooking or heating devices, such as grills.
- Lightning strikes can be associated with structure fires and wildfires, creating additional risk to residents and first responders.
- Emergency operations and services may be significantly impacted due to power outages and/or loss of communications.
- County and city departments may be damaged, delaying response and recovery efforts for the entire community.
- Economic disruption due to power outages and fires negatively impacts the programs and services provided by the community due to short- and long-term loss in revenue, especially if damage is sustained to major employers within the planning area including U.S Air Force and Wichita Falls ISD.
- Some businesses not directly damaged by lightning events may be negatively impacted while utilities are being restored, further slowing economic recovery.
- Businesses that are more reliant on utility infrastructure than others may suffer greater damage without a backup power source.

The economic and financial impacts of lightning on the area will depend entirely on the scale of the event, what is damaged, and how quickly repairs to critical components of the economy can be implemented. The level of preparedness and pre-event planning done by the county, city, local businesses, and citizens will also contribute to the overall economic and financial conditions in the aftermath of any significant lightning event.

CLIMATE CHANGE CONSIDERATIONS

As CO₂ increases and the land surface warms, stronger updrafts are more likely to produce lightning. In a climate with double the amount of CO₂, we may see fewer lightning storms overall, but 25 percent stronger storms, with a 5 percent increase in lightning. Lightning damage is also likely to increase because of its role in igniting forest fires, where dry vegetation, also caused by rising temperatures, creates more 'fuel' for fires, so even a small climate change may have huge consequences. While the impact climate change will have on our weather still remains uncertain,

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researchers agree that implementing simple measures like lightning detection systems and installing grounding systems in buildings could go a long way in avoiding deaths and injuries.⁵

⁵ Environmental Journal, Nathan Neal, January 11, 2021.



SECTION 10

THUNDERSTORM WIND

SECTION 10: THUNDERSTORM WIND

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HAZARD DESCRIPTION

Thunderstorms create extreme wind events which includes straight line winds. Wind is the horizontal motion of the air past a given point, beginning with differences in air pressures. Pressure that is higher at one place than another sets up a force pushing from the high toward the low pressure: the greater the difference in pressures, the stronger the force. The distance between the area of high pressure and the area of low pressure also determines how fast the moving air accelerates.

Thunderstorms are created when heat and moisture near the Earth's surface are transported to the upper levels of the atmosphere. By-products of this process are the clouds, precipitation, and wind that become the thunderstorm.

According to the National Weather Service (NWS), a thunderstorm occurs when thunder accompanies rainfall. Radar observers use the intensity of radar echoes to distinguish between rain showers and thunderstorms.



Straight-line winds are responsible for most thunderstorm wind damages. One type of straight-line wind, the downburst, is a small area of rapidly descending air beneath a thunderstorm. A downburst can cause damage equivalent to a strong tornado and make air travel extremely hazardous.

LOCATION

Thunderstorm wind events can develop in any geographic location and are considered a common occurrence in Texas. Therefore, a thunderstorm wind event could occur at any location within Wichita County's planning area as these storms develop randomly and are not confined to any geographic area within the county. It is assumed that the entire Wichita County planning area, including participating jurisdictions, is uniformly exposed to the threat of thunderstorm winds.

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EXTENT

The extent or magnitude of a thunderstorm wind event is measured by the Beaufort Wind Scale. Table 10-1 describes the different intensities of wind in terms of speed and effects, from calm to violent and destructive.

Table 10-1. Beaufort Wind Scale¹

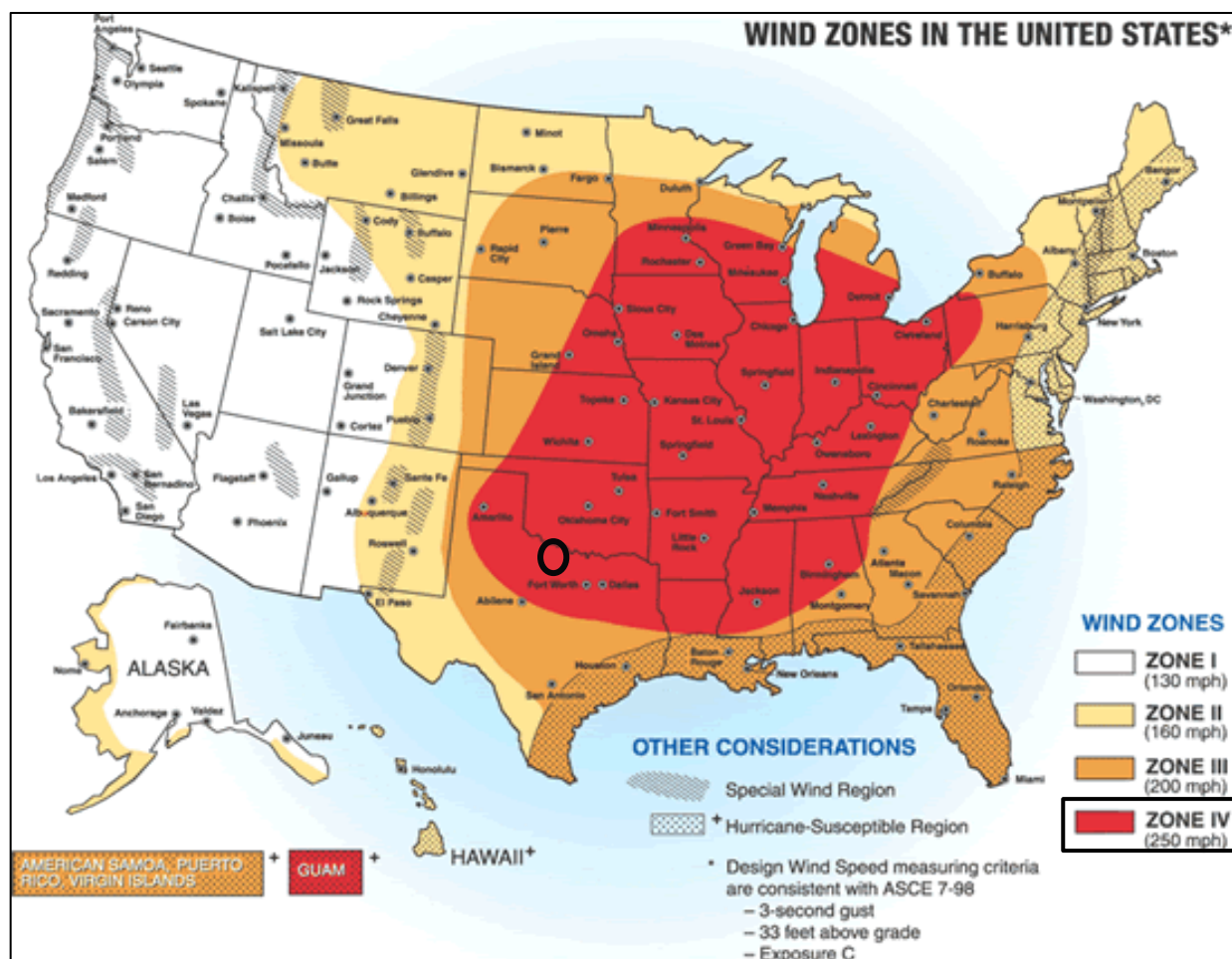
FORCE	WIND SPEED		WMO CLASSIFICATION	APPEARANCE OF WIND EFFECTS
	(mph)	(knots)		
0	Less than 1	Less than 1	Calm	Calm, smoke rises vertically
1	1-3	1-3	Light Air	Smoke drift indicates wind direction, still wind vanes
2	4-8	4-6	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
3	9-14	7-10	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
4	15-21	11-16	Moderate Breeze	Dust, leaves and loose paper lifted, small tree branches move
5	22-28	17-21	Fresh Breeze	Small trees in leaf begin to sway
6	29-36	22-27	Strong Breeze	Larger tree branches moving, whistling in wires
7	37-44	28-33	Near Gale	Whole trees moving, resistance felt walking against wind
8	45-53	34-40	Gale	Whole trees in motion, resistance felt walking against wind
9	54-62	41-47	Strong Gale	Slight structural damage occurs, slate blows off roofs
10	63-72	48-55	Storm	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	73-83	56-63	Violent Storm	If experienced on land, widespread damage
12	84+	64-71	Hurricane	Violence and destruction

Figure 10-1 displays the wind zones as derived from NOAA.

¹ Source: World Meteorological Organization

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Figure 10-1. Wind Zones in the United States²



On average, the planning area experiences one to two thunderstorm wind events every year. The Wichita County planning area is located within Wind Zone IV, meaning it can experience winds up to 250 mph. The county, including participating jurisdictions, has experienced a significant wind event, or an event with winds in the range of “Force 12” on the Beaufort Wind Scale indicating wind speeds 84 mph or higher. This is the worst to be anticipated for the entire planning area.

Based on a search of past events from January 1955 through June 2023, the greatest magnitude wind event the planning area has experienced was 97 knots or 112 mph event in Wichita County on July 20, 1995.

HISTORICAL OCCURRENCES

Historical evidence shows that the planning area is vulnerable to thunderstorm events. Tables 10-2 and 10-3 depict historical occurrences of thunderstorm wind events for the Wichita County planning area according to the NCEI database. From January 1955 through June 2023, 420 thunderstorm wind events are known to have occurred in the Wichita County planning area. Table 10-3 presents information on known historical events impacting the Wichita County planning area

² The Wichita County planning area is indicated by the black circle.

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resulting in damages, injuries, or fatalities. The most damaging event reported in the planning area occurred in Wichita County on March 4, 2004 with reported wind speeds of 74 knots, or 85 mph, causing more than \$1,232,729 in damage (2023 dollars).

It is important to note that high wind events associated with other hazards, such as tornadoes, are not accounted for in this section. It is important to note that the only incidents recorded are those that are reported to the NCEI from January 1955 through June 2023 have been factored into this risk assessment. In the tables that follow throughout this section, some occurrences seem to appear multiple times in one table. This is due to reports from various locations throughout the county. Property damage estimates are not always available. Where a damage estimate has been provided in a table, the dollar amounts have been adjusted for inflation to indicate the damage in 2023 dollars.

Table 10-2. Historical Thunderstorm Wind Events with Reported Damages, 1955-2023³

MAXIMUM WIND SPEED RECORDED (knots)	NUMBER OF REPORTED EVENTS
0-30	64
31-40	2
41-50	27
51-60	198
61-70	74
71-80	8
81-90	3
91-100+	1
Unknown	37

Table 10-3. Historical Thunderstorm Wind Events, 1955-2023⁴

LOCATION	DATE	MAGNITUDE (knots)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
City of Burkburnett	3/29/1993	0	0	0	\$107,249	\$0
Wichita County	2/21/1994	0	0	0	\$10,498	\$0
Wichita County	2/21/1994	0	0	0	\$10,498	\$0
City of Wichita Falls	2/21/1994	0	0	0	\$10,498	\$0
City of Electra	5/24/1994	0	0	0	\$1,044	\$0
City of Wichita Falls	5/24/1994	61	0	0	\$10,442	\$0

³ Events are reported from January 1955 through June 2023.

⁴ Only recorded events with fatalities, injuries or damages are listed. Magnitude is listed when available. Damage values are in 2023 dollars.

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LOCATION	DATE	MAGNITUDE (knots)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
City of Burkburnett	6/19/1994	0	0	0	\$1,041	\$0
City of Burkburnett	7/9/1994	0	0	0	\$1,038	\$0
City of Burkburnett	4/16/1995	0	0	0	\$10,139	\$0
City of Wichita Falls	5/23/1995	9	0	0	\$101,189	\$0
Wichita County	7/20/1995	0	0	0	\$10,099	\$0
City of Wichita Falls	7/20/1995	61	0	0	\$100,989	\$0
Wichita County	1/17/1996	41	0	0	\$9,975	\$0
City of Wichita Falls	6/13/1996	52	0	0	\$2,948	\$0
City of Electra	6/18/1996	Unk	0	0	\$29,485	\$0
City of Burkburnett	7/2/1996	Unk	0	0	\$980,949	\$0
City of Burkburnett	7/2/1996	Unk	0	0	\$3,924	\$0
City of Burkburnett	8/10/1996	Unk	0	0	\$3,917	\$0
City of Burkburnett	9/23/1996	Unk	0	0	\$15,616	\$0
City of Iowa Park	5/8/1997	65	0	0	\$86,576	\$0
City of Wichita Falls	5/8/1997	Unk	0	0	\$1,924	\$0
City of Wichita Falls	5/30/1997	Unk	0	0	\$962	\$0
City of Burkburnett	6/16/1997	52	0	0	\$192	\$0
City of Electra	6/16/1997	Unk	0	0	\$961	\$0
City of Wichita Falls	6/16/1997	Unk	0	0	\$38,430	\$0
City of Iowa Park	7/22/1997	Unk	0	0	\$7,676	\$0
City of Iowa Park	8/17/1997	Unk	0	0	\$3,831	\$0
City of Electra	4/14/1998	Unk	0	0	\$947	\$0
City of Burkburnett	7/13/1998	Unk	0	0	\$13,211	\$0
City of Wichita Falls	8/3/1998	Unk	0	0	\$28,276	\$0
City of Wichita Falls	8/3/1998	Unk	0	0	\$56,552	\$0
City of Electra	11/9/1998	Unk	0	0	\$3,756	\$0
Wichita County	3/2/1999	Unk	0	0	\$14,934	\$0
Wichita County	3/8/1999	Unk	0	0	\$3,734	\$0
City of Electra	5/9/1999	Unk	0	0	\$7,413	\$0
City of Burkburnett	5/27/1999	Unk	0	0	\$1,853	\$0
City of Burkburnett	2/22/2000	Unk	0	0	\$12,698	\$0
City of Wichita Falls	3/7/2000	Unk	0	0	\$21,590	\$0
Wichita County	3/28/2000	Unk	0	0	\$5,398	\$0

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LOCATION	DATE	MAGNITUDE (knots)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
City of Burkburnett	5/26/2000	Unk	0	0	\$44,901	\$0
City of Wichita Falls	5/26/2000	Unk	0	0	\$359	\$0
Wichita County	7/12/2000	Unk	0	0	\$14,260	\$0
City of Wichita Falls	7/13/2000	Unk	0	0	\$74,865	\$0
City of Burkburnett	9/11/2000	Unk	0	0	\$70,931	\$0
City of Wichita Falls	4/10/2001	Unk	0	0	\$26,118	\$0
City of Electra	5/18/2001	Unk	0	0	\$43,334	\$0
City of Wichita Falls	5/18/2001	54	0	0	\$8,666	\$0
City of Iowa Park	5/27/2001	61	0	0	\$866	\$0
Wichita County	4/2/2002	Unk	0	0	\$857	\$0
City of Burkburnett	4/13/2002	Unk	0	0	\$42,828	\$0
City of Burkburnett	6/15/2002	80	0	0	\$171,216	\$0
City of Burkburnett	8/27/2002	64	0	0	\$3,409	\$0
Wichita County	4/27/2003	76	0	0	\$17,596	\$0
Wichita County	6/10/2003	84	0	0	\$16,768	\$0
City of Wichita Falls	8/13/2003	56	0	0	\$25,029	\$0
City of Burkburnett	3/4/2004	69	0	0	\$164,364	\$0
City of Electra	3/4/2004	61	0	0	\$98,618	\$0
City of Wichita Falls	3/4/2004	74	0	0	\$1,232,729	\$0
City of Wichita Falls	6/2/2004	61	0	0	\$405,928	\$0
City of Burkburnett	6/12/2004	56	0	0	\$4,059	\$0
City of Wichita Falls	6/12/2004	56	0	0	\$8,118	\$0
City of Burkburnett	7/3/2004	56	0	0	\$2,440	\$0
City of Burkburnett	7/3/2004	56	0	0	\$1,627	\$0
City of Wichita Falls	12/6/2004	52	0	0	\$5,665	\$0
City of Wichita Falls	8/5/2005	56	0	0	\$15,683	\$0
City of Burkburnett	5/10/2006	65	0	0	\$1,140,807	\$0
Wichita County	2/24/2007	51	0	0	\$15,136	\$0
City of Iowa Park	6/20/2007	53	0	0	\$29,567	\$0
City of Wichita Falls	6/20/2007	61	0	0	\$29,567	\$0
City of Wichita Falls	9/9/2007	56	0	0	\$23,638	\$0
City of Burkburnett	6/5/2008	56	0	0	\$14,076	\$0
City of Electra	6/5/2008	56	0	0	\$16,892	\$0

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LOCATION	DATE	MAGNITUDE (knots)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Wichita County	6/28/2008	52	0	0	\$2,815	\$0
Wichita County	4/2/2010	52	0	0	\$9,890	\$0
City of Burkburnett	4/2/2010	56	0	0	\$21,193	\$0
City of Pleasant Valley	4/2/2010	56	0	0	\$8,477	\$0
City of Pleasant Valley	4/2/2010	56	0	0	\$4,239	\$0
City of Iowa Park	5/13/2010	56	0	0	\$4,235	\$0
City of Wichita Falls	5/13/2010	56	0	0	\$4,235	\$0
City of Wichita Falls	9/2/2010	66	0	0	\$1,410	\$0
City of Burkburnett	9/17/2011	61	0	0	\$5,430	\$0
Wichita County	5/28/2012	52	0	0	\$4,021	\$0
City of Burkburnett	5/29/2012	61	0	1	\$20,104	\$0
City of Burkburnett	6/23/2014	56	0	0	\$2,584	\$0
City of Wichita Falls	6/23/2014	56	0	0	\$2,584	\$0
City of Wichita Falls	6/23/2014	55	0	0	\$6,462	\$0
Wichita County	8/10/2014	56	0	0	\$7,770	\$0
Wichita County	5/28/2015	70	0	0	\$12,952	\$0
City of Electra	5/28/2015	56	0	0	\$6,476	\$0
City of Wichita Falls	5/28/2015	52	0	0	\$3,885	\$0
City of Wichita Falls	4/26/2016	61	0	0	\$6,437	\$0
City of Wichita Falls	4/26/2016	61	0	0	\$1,288	\$0
City of Burkburnett	5/23/2016	62	0	0	\$6,411	\$0
City of Burkburnett	9/18/2016	56	0	0	\$2,551	\$0
City of Burkburnett	5/19/2017	56	0	0	\$12,586	\$0
City of Iowa Park	7/23/2017	56	0	0	\$6,292	\$0
City of Cashion Community	9/19/2017	56	0	0	\$4,992	\$0
City of Electra	10/21/2017	52	0	0	\$2,497	\$0
Wichita County	3/26/2018	56	0	0	\$2,469	\$0
City of Burkburnett	3/26/2018	56	0	0	\$2,469	\$0
Wichita County	6/7/2018	52	0	0	\$3,667	\$0
City of Burkburnett	9/20/2018	52	0	0	\$6,101	\$0
City of Wichita Falls	12/26/2018	61	0	0	\$2,452	\$0
Wichita County	4/13/2019	61	0	0	\$12,054	\$0

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LOCATION	DATE	MAGNITUDE (knots)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Wichita County	8/30/2019	56	0	0	\$600	\$0
City of Electra	8/16/2020	56	0	0	\$1,185	\$0
City of Wichita Falls	8/16/2020	56	0	0	\$2,370	\$0
City of Burkburnett	10/10/2021	70	0	0	\$27,841	\$0
City of Iowa Park	03/23/2023	56	0	0	\$5,200	\$0
City of Wichita Falls	05/06/2023	61	0	0	\$5,200	\$0
TOTAL			0	1	\$5,746,793	\$0

Table 10-4. Summary of Historical Thunderstorm Wind Events, 1955-2023

LOCATION	NUMBER OF EVENTS	MAGNITUDE (knots)	DEATH	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Wichita County	227	97	0	0	\$185,990	\$0
City of Burkburnett	60	80	0	1	\$2,919,755	\$0
City of Cashion Community	2	56	0	0	\$4,992	\$0
City of Electra	24	70	0	0	\$212,608	\$0
City of Iowa Park	19	65	0	0	\$144,244	\$0
City of Pleasant Valley	6	56	0	0	\$12,716	\$0
City of Wichita Falls	82	74	0	0	\$2,266,488	\$0
Total	420	(Max Extent)	0	1	\$5,746,793	

Based on the list of historical thunderstorm wind events for the Wichita County planning area, including all participating jurisdictions (listed above), 49 of the events have occurred since the 2018 Plan.

SIGNIFICANT EVENTS

October 10, 2021 – City of Burkburnett

A warm airmass moving across the region led to the development of numerous severe thunderstorms across Oklahoma and Texas. Several severe wind gusts and large hail were reported with storms across western North Texas. Within Wichita County, it was reported that numerous trees were down, some causing damage to residential structures and several buildings with moderate to major damage along with nearly a dozen campers / trailers damaged. Total damage as a result was reported to be approximately \$27,841 (2023 dollars).

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May 10, 2006 – City of Burkburnett

A thunderstorm impacted the region with reports by the City of Burkburnett indicating numerous streets were closed due to downed trees blocking roadways and impacting residential structures and flipping trailers. Four power poles were snapped in addition to TXU Electric reporting five to six feeder lines being impacted. Total damage as a result was \$1,140,807 (2023 dollars).

June 2, 2004 – City of Wichita Falls

Severe winds caused a damaged path about 60 yards wide on the south side of the City of Wichita Falls. Six hangars were destroyed at the airport, while two aircraft were also damaged. Several power poles were downed with a few pulled out of the ground impacting the city. Total reported damage was approximately \$405,928 (2023 dollars).

PROBABILITY OF FUTURE EVENTS

Most thunderstorm winds occur during the spring and fall seasons and during the months of March, April, May, and September. Based on available records of historic events, there have been a total of 420 events in a 68.5-year reporting period, which provides a probability of six to seven events every year. Even though the intensity of thunderstorm wind events is not always damaging for the Wichita County planning area, the frequency of occurrence for a thunderstorm wind event is highly likely. This means that an event is probable within the next year for the planning area. See additional information on climate change at the end of this section.

VULNERABILITY AND IMPACT

Vulnerability is difficult to evaluate since thunderstorm wind events can occur at different strength levels, in random locations, and can create relatively narrow paths of destruction. Due to the randomness of these events, all existing and future structures and facilities within the Wichita County planning area could potentially be impacted and remain vulnerable to possible injury and property loss from strong winds.

Trees, power lines and poles, signage, manufactured housing, radio towers, concrete block walls, storage barns, windows, garbage receptacles, brick facades, and vehicles, unless reinforced, are vulnerable to thunderstorm wind events. More severe damage involves windborne debris; in some instances, patio furniture and other lawn items have been reported to have been blown around by wind and, very commonly, debris from damaged structures in turn have caused damage to other buildings not directly impacted by the event. In numerous instances roofs have been reported as having been torn off of buildings. The portable buildings typically used at schools and construction sites would be more vulnerable to thunderstorm wind events than typical site-built structures and could potentially pose a greater risk for wind-blown debris.

According to the American Community Survey (ACS), five-year estimates for 2021, a total of 2,383 manufactured homes are located in the Wichita County planning area (4.3 percent of total housing). In addition, 66.1 percent (approximately 36,727 structures) of the housing units were built before 1980 (Table 10-5). These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damage during significant wind events. Based on the ACS estimates, the City of Wichita Falls has the highest reported number of single-family residences (SFR) built before 1980, as well as the greatest amount of manufactured homes following the county, causing this jurisdiction to potentially sustain more structural damage due to a thunderstorm event.

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Table 10-5. Structures at Greatest Risk by Jurisdiction

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Wichita County	2,383	36,727
City of Burkburnett	558	3,445
City of Cashion Community	26	79
City of Electra	102	1,097
City of Iowa Park	152	1,857
City of Pleasant Valley	16	78
City of Wichita Falls	1,180	28,742

While all citizens are vulnerable to the impacts of thunderstorm wind, forced relocation and disaster recovery drastically impacts low-income residents who lack the financial means to travel, afford a long-term stay away from home, and to rebuild or repair their homes. An estimated 16.6 percent of the planning area population live below the poverty level (Table 10-6). While warning times for these type of hazard events should be substantial enough for these individuals to seek shelter, individuals who work and recreate outside are also vulnerable to potential impacts of a thunderstorm wind event.

Table 10-6. Populations at Greatest Risk by Jurisdiction

JURISDICTION	POPULATION BELOW POVERTY LEVEL ⁵
Wichita County	21,484
City of Burkburnett	1,063
City of Cashion Community	9
City of Electra	497
City of Iowa Park	524
City of Pleasant Valley	25
City of Wichita Falls	18,974

The Wichita County Planning Team identified the following critical facilities as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by thunderstorm wind events. The critical infrastructure with the greatest vulnerability to thunderstorms are power and communications facilities. Power failure can result in a loss of critical services and may cause response delays for emergency personnel. Individuals with

⁵ US Census Bureau American Community Survey (ACS), 2021 estimates for Wichita County.

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medical needs that require electricity may require immediate emergency services. For a comprehensive list by participating jurisdiction see Appendix C.

Table 10-7. Critical Facilities Vulnerable to Thunderstorm Wind Events

CRITICAL FACILITIES	POTENTIAL IMPACTS
Emergency Response Departments (EOC, Fire, Police, EMS), Hospitals	<ul style="list-style-type: none"> Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. Emergency vehicles can be damaged by falling trees or flying debris. Power outages could disrupt communications, delaying emergency response times. Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. Debris/downed trees can impede emergency response vehicle access to areas. Increased number of structure fires due to gas line ruptures and downed power lines, further straining the capacity and resources of emergency personnel. First responders are exposed to downed power lines, unstable and unusual debris, hazardous materials, and generally unsafe conditions.
Airport, Academic Institutions, Evacuation Centers & Shelters, Governmental Facilities	<ul style="list-style-type: none"> Structures can be damaged by falling trees or flying debris. Power outages could disrupt critical care. Backup power sources could be damaged. Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. Evacuations may be necessary due to extended power outages, gas line ruptures, or structural damage to facilities. Power outages and infrastructure damage may prevent larger airports from acting as temporary command centers for logistics, communications, and emergency operations. Temporary break in operations may significantly inhibit post event evacuations. Damaged or destroyed highway infrastructure may substantially increase the need for airport operations.
Utility Services and Infrastructure (electric, water, wastewater, communications)	<ul style="list-style-type: none"> Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. Emergency vehicles can be damaged by falling trees or flying debris. Power outages could disrupt communications, delaying emergency response times. Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. Debris/downed trees can impede emergency response vehicle access to areas. Increased number of structure fires due to gas line ruptures and downed power lines, further straining the capacity and resources of emergency personnel.

A thunderstorm wind event can also result in traffic disruptions, injuries and in rare cases, fatalities. Impact of thunderstorms winds experienced in the Wichita County planning area has

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resulted in one injury and no fatalities. Impact of thunderstorm wind events experienced in the planning area, including participating jurisdictions, would be considered “Limited,” with less than 10 percent of property expected to be destroyed and critical facilities shut down for less than 24-hours. However, with one injury, the impact could be considered “Major” depending on the severity of the event. Overall, in the past 68.5 years there has been a total of \$5,746,793 damages (in 2023 dollars) in the Wichita County planning area due to thunderstorm wind events. The estimated average annual loss from a thunderstorm wind event is \$83,895.

Table 10-8. Estimated Annualized Losses by Participating Jurisdiction

JURISDICTION	TOTAL PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Wichita County	\$185,990	\$2,715
City of Burkburnett	\$2,919,755	\$42,624
City of Cashion Community	\$4,992	\$73
City of Electra	\$212,608	\$3,104
City of Iowa Park	\$144,244	\$2,106
City of Pleasant Valley	\$12,716	\$186
City of Wichita Falls	\$2,266,488	\$33,087
TOTAL	\$5,746,793	\$83,895

ASSESSMENT OF IMPACTS

Thunderstorm wind events have the potential to pose a significant risk to people and can create dangerous and difficult situations for public health and safety officials. Thunderstorm wind conditions can be frequently associated with a variety of impacts, including:

- Individuals exposed to the storm can be struck by flying debris, falling limbs, or downed trees causing serious injury or death.
- Structures can be damaged or crushed by falling trees, which can result in physical harm to the occupants.
- Significant debris and downed trees can result in emergency response vehicles being unable to access areas of the community.
- Downed power lines may result in roadways being unsafe for use, which may prevent first responders from answering calls for assistance or rescue.
- During exceptionally heavy wind events, first responders may be prevented from responding to calls, as the winds may reach a speed at which their vehicles and equipment are unsafe to operate.
- Widespread power outages are possible, increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.
- Extended power outage often results in an increase in structure fires and carbon monoxide poisoning, as individuals attempt to cook or heat their homes with alternate, unsafe cooking or heating devices, such as grills.

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- First responders are exposed to downed power lines, unstable and unusual debris, hazardous materials, and generally unsafe conditions.
- Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications.
- Critical staff may be unable to report for duty, limiting response capabilities.
- County and city departments may be damaged, delaying response and recovery efforts for the entire community.
- Private sector entities that the county and cities along with residents rely on, such as utility providers, financial institutions, and medical care providers may not be fully operational and may require assistance from neighboring communities until full services can be restored.
- Economic disruption negatively impacts the programs and services provided by the community due to short- and long-term loss in revenue.
- Some businesses not directly damaged by thunderstorm wind events may be negatively impacted while roads are cleared and utilities are being restored, further slowing economic recovery.
- Older structures built (66.1% of the planning area) to less stringent building codes may suffer greater damage as they are typically more vulnerable to thunderstorm winds.
- Large scale wind events can have significant economic impact on the affected area, as it must now fund expenses such as infrastructure repair and restoration, temporary services and facilities, overtime pay for responders, and normal day-to-day operating expenses.
- Businesses that are more reliant on utility infrastructure than others may suffer greater damage without a backup power source.
- Recreational areas and parks, including River Bend Nature Center may be damaged or inaccessible due to downed trees or debris, causing temporary impacts to area businesses.
- Historical sites and properties, a total of 13 buildings and sites within Wichita County, are listed on the National Register of Historic Places and are placed at a higher risk of impact.

The economic and financial impacts of thunderstorm winds on the area will depend entirely on the scale of the event, what is damaged, and how quickly repairs to critical components of the economy can be implemented. The level of preparedness and pre-event planning done by the community, local businesses, and citizens will also contribute to the overall economic and financial conditions in the aftermath of any thunderstorm wind event.

CLIMATE CHANGE CONSIDERATIONS

The impacts on the frequency and severity of severe thunderstorm wind events due to climate change are unclear. According to the Texas A&M 2021 Climate Report Update, changes in severe thunderstorm reports over time have been more closely linked to changes in population than changes in the hazard event. At this time there is low confidence of an ongoing trend in the overall frequency and severity of thunderstorm events, due to the lack of climate data records for severe thunderstorms. Based on climate models that are available, the environmental conditions needed

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for severe thunderstorms are estimated to become more likely, resulting in an overall increase in the number of days capable of producing a severe thunderstorm event.⁶

⁶ Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, Texas A&M University Office of the Texas State Climatologist, 2021 update.



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HAZARD DESCRIPTION



Tornadoes are among the most violent storms on the planet. A tornado is a rapidly rotating column of air extending between, and in contact with, a cloud and the surface of the earth. The most violent tornadoes are capable of tremendous destruction and have wind speeds of 250 miles per hour (mph) or more. In extreme cases, winds may approach 300 mph. Damage paths can be in excess of one mile wide and 50 miles long.

The most powerful tornadoes are produced by “Supercell Thunderstorms.” These thunderstorms are created when horizontal wind shears (winds moving in different directions at different altitudes) begin to rotate the storm. This horizontal rotation can be tilted vertically by violent updrafts, and the rotation radius can shrink, forming a vertical column of very quickly swirling air. This rotating air can eventually reach the ground, forming a tornado.

Table 11-1. Variations among Tornadoes

WEAK TORNADOES	STRONG TORNADOES	VIOLENT TORNADOES
<ul style="list-style-type: none">69% of all tornadoesLess than 5% of tornado deathsLifetime 1-10+ minutesWinds less than 110 mph	<ul style="list-style-type: none">29% of all tornadoesNearly 30% of all tornado deathsMay last 20 minutes or longerWinds 110 – 205 mph	<ul style="list-style-type: none">2% of all tornadoes70% of all tornado deathsLifetime can exceed one hourWinds greater than 205 mph

LOCATION

Tornadoes do not have any specific geographic boundary and can occur throughout the planning area uniformly. It is assumed that the entire Wichita County planning area, including all participating jurisdictions, is susceptible to a potential tornado event. The entire planning area is located in Wind Zone IV where tornado winds can be as high as 250 mph, refer to Figure 11-1.

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Figure 11-1. FEMA Wind Zones in the United States

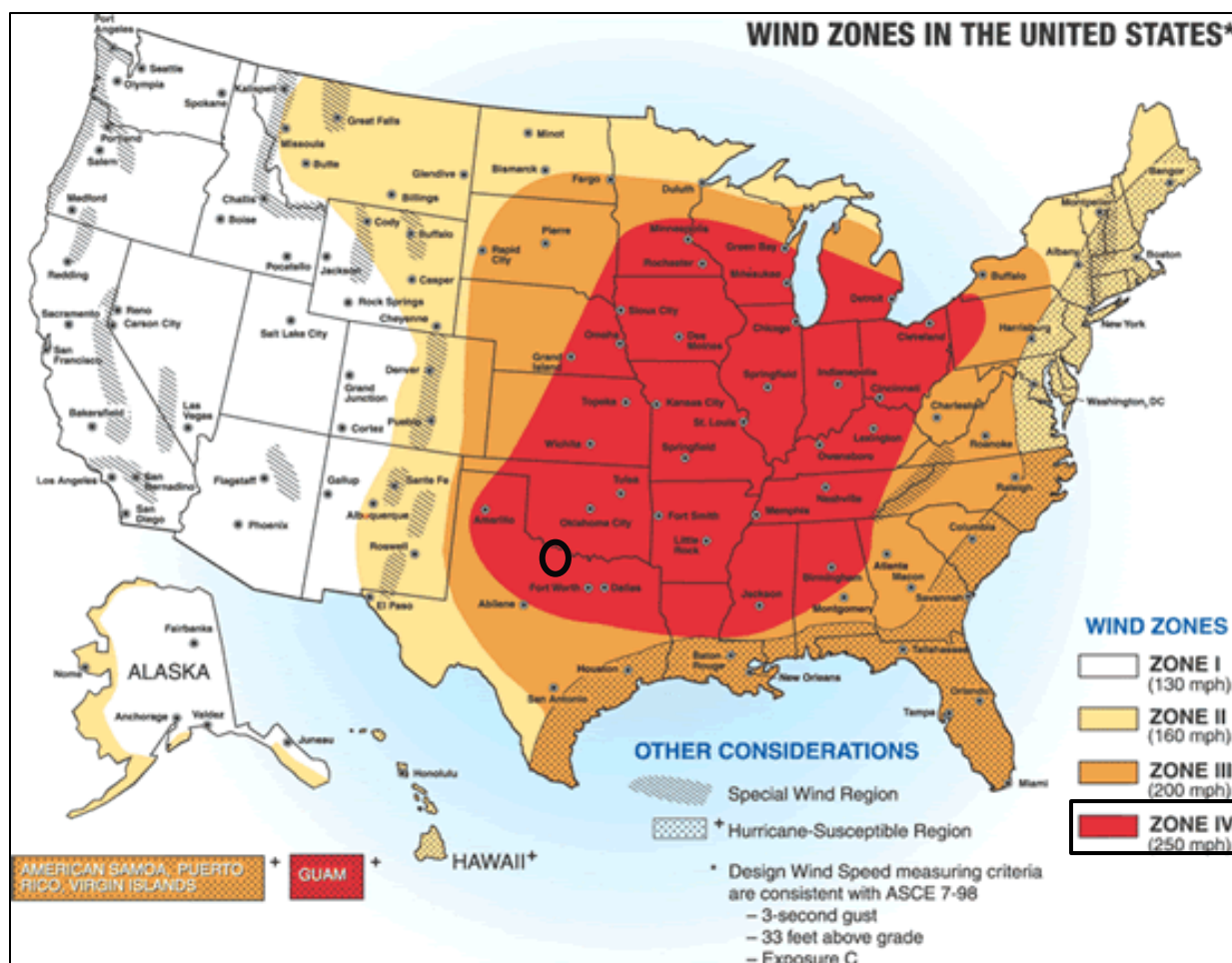
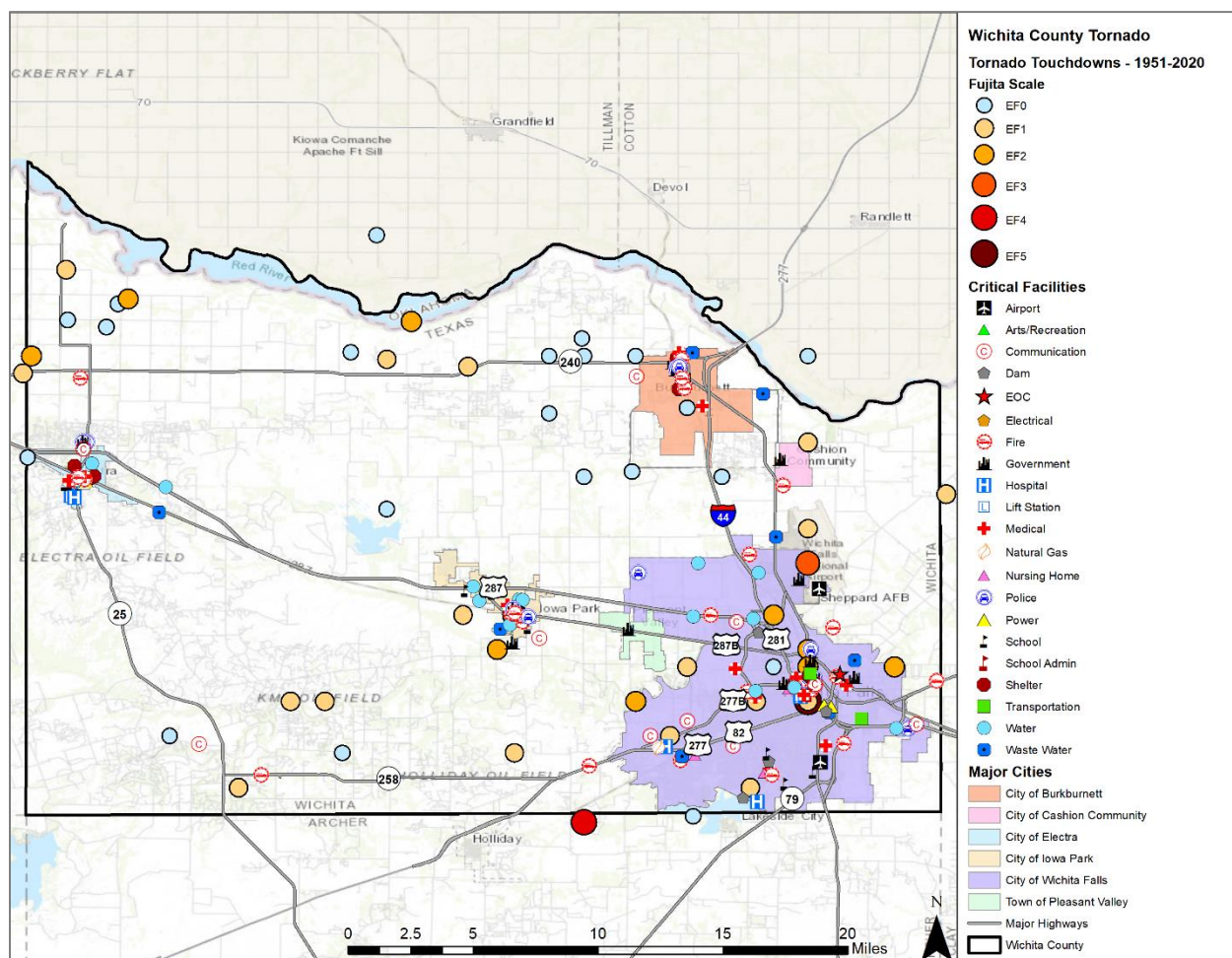


Figure 11-2 shows the locations of historic tornado events in the Wichita County planning area between January 1951 and June 2023.

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Figure 11-2. Historical Tornado Events in Wichita County



EXTENT

The destruction caused by tornadoes ranges from light to inconceivable, depending on the intensity, size, and duration of the storm. Typically, tornadoes cause the greatest damage to structures of light construction, such as residential homes (particularly mobile homes).

Tornado magnitudes prior to 2007 were determined using the traditional version of the Fujita Scale, which estimated tornado wind speeds based on the damage caused by an event. Since February 2007, the Enhanced Fujita Scale has been utilized to classify tornadoes, which included improvements to the original scale. The original Fujita scale had limitations, such as a lack of damage indicators, no account for construction quality and variability, and no definitive correlation between damage and wind speed. These limitations led to some tornadoes being rated in an inconsistent manner and, in some cases, an overestimate of tornado wind speeds. The Enhanced Fujita scale retains the same basic design and six strength categories as the previous scale. The newer scale reflects more refined assessments of tornado damage surveys, standardization, and damage consideration to a wider range of structures. Table 11-2 includes both scales for reference when analyzing historical tornadoes since tornado events prior to 2007 will follow the original Fujita Scale.

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Table 11-2. The Fujita and Enhanced Fujita Tornado Scale¹

Enhanced Fujita Scale				Fujita Scale			
Category	Wind Speed	Damage Level	Damage	Category	Wind Speed	Intensity	Damage
EF0	65-85 MPH	Gale	The environment sustained minor damage: tree branches are broken, some shallow-rooted trees are uprooted, and some chimneys are damaged.	F0	45-78 MPH	Gale	Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
EF1	86-110 MPH	Weak	The environment sustained moderate damage: mobile homes are tipped over, windows are broken, roof tiles may be blown off, and some tree trunks have snapped.	F1	79-117 MPH	Moderate	Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
EF2	111-135 MPH	Strong	The environment sustained considerable damage: mobile homes are destroyed, roofs are damaged, debris flies in the air, and large trees are snapped or uprooted.	F2	118-161 MPH	Significant	Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF3	136-165 MPH	Severe	The environment sustained severe damage: roofs and walls are ripped off buildings, small buildings are destroyed, and most trees are uprooted.	F3	162-209 MPH	Severe	Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
EF4	166-200 MPH	Devastating	The environment sustained devastating damage: well-built homes are destroyed, buildings are lifted off their foundations, cars are blown away, and large debris flies in the air.	F4	210-261 MPH	Devastating	Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown, and large missiles generated.
EF5	200+ MPH	Incredible	The environment sustained incredible damage: well-built homes are lifted from their foundations, reinforced concrete buildings are damaged, the bark is stripped from trees, and car-sized debris flies through the air.	F5	262-317 MPH	Incredible	Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yds); trees debarked; incredible phenomena will occur.

¹ <http://www.tornadoproject.com/fscale/fscale.htm>

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Both the Fujita Scale and Enhanced Fujita Scale should be referenced in reviewing previous occurrences since tornado events prior to 2007 will follow the original Fujita Scale. The greatest magnitude reported within the planning area is F5 on the Fujita Scale, an “Incredible Tornado.” Based on the planning area’s location in Wind Zone IV, all participating jurisdictions have the potential to experience anywhere from an EF0 to an EF5 depending on the wind speed. Previous tornado events in the Wichita County planning area, including participating jurisdictions, (converted from the Fujita Scale) have been between EF0 and EF5 (Figure 11-1). This is the strongest event the planning area can anticipate in the future.

HISTORICAL OCCURRENCES

Only reported tornadoes were factored into the Risk Assessment. It is likely that a high number of occurrences have gone unreported over the past 72.5 years. Historical tornado data for the Wichita County planning area is shown within a county-wide basis per the NCEI database.

Figure 11-2, above, identifies the locations of previous occurrences in the Wichita County planning area from January 1951 through June 2023. A total of 61 events have been recorded by the Storm Prediction Center (NOAA) and National Centers for Environmental Information (NCEI) database for the Wichita County planning area. The strongest event reported in the planning area was an F5 tornado (200+ mph) that occurred in Wichita County on April 3, 1964. More recently, the planning area experienced an EF1 tornado (86 – 110 mph) that occurred on May 22, 2020.

Table 11-4. Historical Tornado Events, 1951-2023²

JURISDICTION	DATE	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Wichita County	4/20/1951	F2	0	0	\$298,466	\$0
Wichita County	5/9/1951	F2	0	0	\$297,314	\$0
Wichita County	3/17/1952	F1	0	0	\$292,792	\$0
Wichita County	6/19/1953	F1	0	1	\$2,874	\$0
Wichita County	8/11/1953	F2	0	0	\$2,862,620	\$0
Wichita County	6/1/1954	F3	1	4	\$2,862,620	\$0
Wichita County	5/26/1955	F2	0	0	\$288,407	\$0
Wichita County	4/2/1958	F3	1	14	\$2,664,514	\$0
Wichita County	11/17/1958	F2	0	0	\$265,533	\$0
Wichita County	4/8/1961	F2	0	2	\$258,405	\$0
Wichita County	4/26/1962	F3	0	13	\$25,498,166	\$0
City of Wichita Falls	4/3/1964	F5	7	600	\$249,205,372	\$0
Wichita County	5/30/1967	F1	0	0	\$23,194	\$0
Wichita County	5/30/1967	F2	0	0	\$231,941	\$0

² Only recorded events with fatalities, injuries or damages are listed. Magnitude is listed when available. Damage values are in 2023 dollars.

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JURISDICTION	DATE	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Wichita County	3/3/1973	F0	0	0	\$1,778	\$0
Wichita County	4/20/1974	F1	0	0	\$1,605	\$0
Wichita County	4/16/1977	F1	0	0	\$128,341	\$0
Wichita County	9/12/1977	F0	0	0	\$12,541	\$0
City of Wichita Falls	4/10/1979	F4	46	1,740	\$1,090,714,731	\$0
Wichita County	4/10/1979	F1	0	0	\$109,071	\$0
Wichita County	5/13/1983	F1	0	0	\$94	\$0
City of Burkburnett	6/9/1995	F0	0	0	\$10,099	\$0
City of Burkburnett	6/16/1997	F1	0	0	\$38,430	\$0
City of Wichita Falls	4/10/2001	F1	0	0	\$261,179	\$0
Wichita County	4/7/2008	EF1	0	0	\$7,169	\$0
Wichita County	5/18/2017	EF2	0	0	\$125,859	\$0
Wichita County	5/22/2020	EF1	0	0	\$6,007	\$0
City of Burkburnett	5/22/2020	EF1	0	0	\$12,013	\$0
TOTAL	61	(MAX EXTENT)	55	2,374	\$1,376,481,135	\$0

Table 11-5. Historical Tornado Events, 1951-2023³

LOCATION	NUMBER OF EVENTS	MAGNITUDE	DEATH	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Wichita County	37	F3	2	34	\$36,239,311	\$0
City of Burkburnett	14	F1	0	0	\$60,542	\$0
City of Cashion Community	0	-	-	-	-	-
City of Electra	2	EF0	0	0	\$0	\$0
City of Iowa Park	3	EF0	0	0	\$0	\$0
City of Pleasant Valley	0	-	-	-	-	-
City of Wichita Falls	5	F5	53	2,340	\$1,340,181,282	\$0
Total	61	(MAX EXTENT)	55	2,374	\$1,376,481,135	

³ Only recorded events with fatalities, injuries or damages are listed. Magnitude is listed when available. Events are reported from January 1951 through June 2023. Damage values are in 2023 dollars.

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In summary, unincorporated Wichita County experienced the greatest number of tornado events within 37 reported events based on the NCEI database, followed by the City of Burkburnett with 14 reported tornado events. The most significant event in relation to damage and casualties occurred on April 10, 1979, in the City of Wichita Falls, and resulted in over \$1 billion in damages (2023 dollars), 46 fatalities and 1,740 injuries. More details on the event can be found below. Based on the list of historical tornado events for the Wichita County planning area (listed above), there have been 3 recorded events since the 2018 Plan.

SIGNIFICANT EVENTS

May 18, 2017 – Wichita County

A line of storms spanned across the region and continued eastward. A tornado developed northeast of Haynesville, located in Wichita County, and moved east-northeast along Flippin Road. A number of large metal electrical transmission towers were damaged and a few collapsed. Total damage as a result of this event was \$125,859 (2023 dollars).

April 10, 2001 – City of Wichita Falls

A tornado developed near the City of Wichita Falls with reported winds of 35 to 45 mph from the southeast with gusts near 60 mph developed across western North Texas and persisted through much of the night. This tornado developed on the south side of the City of Wichita Falls, a short distance from Lake Wichita. Most of the damage consisted of downed trees, fences, and signs. However, near the junction of US Highway 281 and US Highway 287, a commercial building sustained significant damage when the roof was pushed upward causing the walls to cave. It was reported that approximately ten utility poles were snapped as well. The maximum F-scale rating is F1, however most damage was rated F0. There were no reported injuries, with damage estimated to be \$261,179 (2023 dollars).

April 10, 1979 – City of Wichita Falls

There is no detailed narrative provided with the NCEI database for this event. However, it was recorded that 46 fatalities and 1,740 injuries resulted from the 1979 tornado within the City of Wichita Falls. Total damage was reported to be \$1,090,714,731 (2023 dollars). Texas Archives reported “an F4 tornado hit Wichita Falls, Texas. Measuring a mile and a half wide at its maximum size, the super tornado cut a destructive path through the city’s south side, destroying 5,000 homes and leaving almost 25,000 residents homeless. Forty-six people died as a result of the storm, and another 1,740 were injured.”⁴

The 2020 Wichita Falls HMAP included additional narrative for the event, including that the path of the destruction covered almost 20 percent of the geographic area within the City of Wichita Falls. The total property damage for the city was estimated to be \$16,916,066 (2023 dollars) with over 3,000 homes destroyed, 1,000 homes damaged, and over 1,000 apartment units / condominiums destroyed, with another 130 damaged. The damage estimates also accounted for approximately 140 mobile homes destroyed, two schools destroyed, and an additional 11 schools sustaining serious damage. An estimated 100 businesses were also damaged. It was estimated that for the City of Wichita Falls 20,000 residents were left displaced (10-20% of the total population).

⁴ Terrible Tuesday - the weidman collection. Main page. (n.d.).

https://texasarchive.org/2021_00053#:~:text=On%20Tuesday%2C%20April%2010%2C%201979%2C%20an%20F-4%20tornado,of%20the%20storm%2C%20and%20another%201%2C700%20were%20injured.

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PROBABILITY OF FUTURE EVENTS

Tornadoes can occur at any time of year and at any time of day, but they are typically more common in the spring months during the late afternoon and evening hours. A smaller, high frequency period can emerge in the fall during the brief transition between the warm and cold seasons. With 61 events in a 72.5-year reporting period, the Wichita County planning area, including all participating jurisdictions, can experience a tornado touchdown approximately once every year. This frequency supports a highly likely probability of future events.

VULNERABILITY AND IMPACT

Due to the randomness of tornado events, all existing and future buildings, facilities, and infrastructure in the Wichita County planning area, including participating jurisdictions, are considered to be exposed to this hazard and could potentially be impacted. The damage caused by a tornado is typically a result of high wind velocity and wind-blown debris.

The average tornado moves from southwest to northeast, but tornadoes have been known to move in any direction. Consequently, vulnerability of humans and property is difficult to evaluate since tornadoes form at different strengths, in random locations, and create relatively narrow paths of destruction. Although tornadoes strike at random, making all buildings vulnerable, three types of structures are more likely to suffer damage:

- Manufactured homes;
- Homes on crawlspaces (more susceptible to lift); and
- Buildings with large spans, such as shopping malls, gymnasiums, and factories.

Tornadoes can cause a significant threat to people as they could be struck by flying debris, falling trees or branches, utility lines, and poles. Blocked roads could prevent first responders from responding to calls. Tornadoes commonly cause power outages which could cause health and safety risks to residents and visitors, as well as to patients in hospitals.

The Wichita County planning area features mobile or manufactured home parks throughout the planning area. These parks are typically more vulnerable to tornado events than typical site-built structures. In addition, manufactured homes are located sporadically throughout the planning area which would also be more vulnerable. U.S. Census data indicates a total 2,383 (4.3 percent of total housing stock) manufactured homes located in the planning area. In addition, 66.1 percent (approximately 36,727 structures) of the housing structures in the Wichita County planning area were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damage during significant tornado events. For additional information on building inventory growth rates please refer to Section 3 of this plan.

Table 11-6. Structures at Greater Risk to Tornado Events

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Wichita County	2,383	36,727
City of Burkburnett	558	3,445

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JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
City of Cashion Community	26	79
City of Electra	102	1,097
City of Iowa Park	152	1,857
City of Pleasant Valley	16	78
City of Wichita Falls	1,180	28,742

While all citizens are at risk to the impacts of a tornado, forced relocation and disaster recovery drastically impacts low-income residents who lack the financial means to travel, afford a long-term stay away from home, and to rebuild or repair their homes. An estimated 16.6 percent of the planning area population live below the poverty level (Table 11-7), with the City of Wichita Falls having the highest percentage of residents living below poverty level. While warning times for these type of hazard events should be substantial enough for these individuals to seek shelter, individuals who work and recreate outside are also vulnerable to potential impacts of a tornado event.

Table 11-7. Populations at Greater Risk to Tornado Events⁵

JURISDICTION	POPULATION BELOW POVERTY LEVEL
Wichita County	21,484
City of Burkburnett	1,063
City of Cashion Community	9
City of Electra	439
City of Iowa Park	524
City of Pleasant Valley	25
City of Wichita Falls	18,974

The Wichita County Planning Team identified the following critical facilities as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by tornado events (Table 11-8). The critical infrastructure with the greatest vulnerability to tornadoes are power and communication facilities. Failures of these facilities can result in a loss of service and cascading impacts including placing individuals dependent on electricity to live independently becoming at great risk of medical emergencies. For a comprehensive list by participating jurisdiction see Appendix C.

⁵ U.S. Census Bureau, American Community Survey Five-Year Estimates, 2017-2021

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Table 11-8. Critical Facilities Vulnerable to Tornado Event

CRITICAL FACILITIES	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS), Hospitals	<ul style="list-style-type: none"> Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. Emergency vehicles can be damaged by falling trees or flying debris. Power outages could disrupt communications, delaying emergency response times. Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. Debris/downed trees can impede emergency response vehicle access to areas. Increased number of structure fires due to gas line ruptures and downed power lines, further straining the capacity and resources of emergency personnel. First responders are exposed to downed power lines, unstable and unusual debris, hazardous materials, and generally unsafe conditions. Extended power outages and evacuations may lead to possible looting, destruction of property, and theft, further burdening law enforcement resources.
Airport, Academic Institutions, Evacuation Centers & Shelters, Governmental Facilities	<ul style="list-style-type: none"> Structures can be damaged by falling trees damaged by a tornado. Power outages could disrupt critical care. Backup power sources could be damaged. Evacuations may be necessary due to extended power outages, fires, or other associated damage to facilities. Power outages and infrastructure damage may prevent larger airports from acting as temporary command centers for logistics, communications, and emergency operations. Temporary break in operations may significantly inhibit post event evacuations. Damaged or destroyed highway infrastructure may substantially increase the need for airport operations.
Utility Services and Infrastructure (electric, water, wastewater, communications)	<ul style="list-style-type: none"> Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. Emergency vehicles can be damaged by falling trees or flying debris. Power outages could disrupt communications, delaying emergency response times. Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. Debris/downed trees can impede emergency response vehicle access to areas. Increased number of structure fires due to gas line ruptures and downed power lines, further straining the capacity and resources of emergency personnel. First responders are exposed to downed power lines, unstable and unusual debris, hazardous materials, and generally unsafe conditions. Extended power outages and evacuations may lead to possible looting, destruction of property, and theft, further burdening law enforcement resources.

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The average annual loss estimates of property and crop due to tornado events is \$18,985,947 (in 2023 dollars), having an approximate total loss estimate of \$1,376,481,135 (2023 dollars) over the reporting period. Based on historic damages, and the best available data, the impact of a tornado event on the Wichita County planning area, including participating jurisdictions, would be considered “Minor”, with critical facilities and services shutdown for more than one week and more than 10 percent of properties destroyed or with major damage. However, due to the number of past injuries and fatalities, the impact of tornado events for the planning area is considered “Substantial,” with multiple injuries and fatalities possible depending on the severity of the event.

Table 11-10. Estimated Average Annualized Losses by Jurisdiction

JURISDICTION	TOTAL PROPERTY & CROP LOSS	AVERAGE ANNUAL LOSS ESTIMATES
Wichita County	\$36,239,311	\$499,853
City of Burkburnett	\$60,542	\$835
City of Cashion Community	-	-
City of Electra	\$0	\$0
City of Iowa Park	\$0	\$0
City of Pleasant Valley	-	-
City of Wichita Falls	\$1,340,181,282	\$18,458,259
TOTAL	\$1,376,481,135	\$18,985,947

ASSESSMENT OF IMPACTS

Tornadoes have the potential to pose a significant risk to the population and can create dangerous situations. Often providing and preserving public health and safety is difficult following tornado events. More destructive tornado conditions can be frequently associated with a variety of impacts, including:

- Individuals exposed to the storm can be struck by flying debris, falling limbs, or downed trees causing serious injury or death.
- Structures can be damaged or crushed by falling trees, which can result in physical harm to the occupants.
- Manufactured homes may suffer substantial damage as they would be more vulnerable than typical site-built structures, especially the City of Wichita Falls, who have the most manufactured structures within the planning area.
- Significant debris and downed trees can result in emergency response vehicles being unable to access areas of the community.
- Downed power lines may result in roadways being unsafe for use, which may prevent first responders from answering calls for assistance or rescue.
- Tornadoes often result in widespread power outages increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.

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- Extended power outages can result in an increase in structure fires and/or carbon monoxide poisoning as individuals attempt to cook or heat their home with alternate, unsafe cooking or heating devices, such as grills.
- Tornadoes can destroy or make residential structures uninhabitable, requiring shelter or relocation of residents in the aftermath of the event.
- First responders must enter the damage area shortly after the tornado passes to begin rescue operations and to organize cleanup and assessments efforts, therefore they are exposed to downed power lines, unstable and unusual debris, hazardous materials, and generally unsafe conditions, elevating the risk of injury to first responders and potentially diminishing emergency response capabilities.
- Emergency operations and services may be significantly impacted due to damaged facilities, loss of communications, and damaged emergency vehicles and equipment.
- County and city departments may be damaged or destroyed, delaying response and recovery efforts for the entire community.
- Private sector entities rely on, such as utility providers, financial institutions, and medical care providers may not be fully operational and may require assistance from neighboring communities until full services can be restored.
- Economic disruption negatively impacts the programs and services provided by the community due to short- and long-term loss in revenue, especially if damage is sustained to major employment sectors within the planning area. The most common employment sectors in the planning area include education services and health care (25%), retail (14%) and manufacturing (9%).
- Damage to infrastructure may slow economic recovery since repairs may be extensive and lengthy.
- Some businesses not directly damaged by the tornado may be negatively impacted while roads and utilities are being restored, further slowing economic recovery.
- When the community is affected by significant property damage it is anticipated that funding would be required for infrastructure repair and restoration, temporary services and facilities, overtime pay for responders, and normal day-to-day operating expenses.
- Displaced residents may not be able to immediately return to work, further slowing economic recovery.
- Large or intense tornadoes may result in a dramatic population fluctuation, as people are unable to return to their homes or jobs and must seek shelter and/or work outside of the affected area.
- Businesses that are uninsured or underinsured may have difficulty reopening, which results in a net loss of jobs for the community and a potential increase in the unemployment rate.
- Recreation activities may be unavailable, and tourism can be unappealing for years following a large tornado, devastating directly related local businesses especially within River Bend Nature Center.
- Historical sites and properties, a total of 13 buildings and sites within Wichita County listed on the National Register of Historic Places and are placed at a higher risk of impact.

The economic and financial impacts of a tornado event on the community will depend on the scale of the event, what is damaged, costs of repair or replacement, lost business days in impacted areas, and how quickly repairs to critical components of the economy can be implemented. The level of preparedness and pre-event planning done by government, businesses, and citizens will

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contribute to the overall economic and financial conditions in the aftermath of a tornado event. Warning sirens / alert systems have also been integrated into participating communities to promote early warning and communication for the community. See Appendix F for a comprehensive list of jurisdictions that have this system in place.

CLIMATE CHANGE CONSIDERATIONS

The impacts on the frequency and severity of tornado events due to climate change are unclear. According to the Texas A&M 2021 Climate Report Update, the most robust trend in tornado activity in Texas is a likelihood for a greater number of tornadoes in large outbreaks, although the factors contributing to this trend are not expected to continue. Tornadoes spawn from less than 10 percent of thunderstorms, usually supercell thunderstorms that are in a wind shear environment that promotes rotation.⁶ Based on climate models that are available, the environmental conditions needed for severe thunderstorm events are estimated to become more likely, resulting in an overall increase in the number of days capable of producing a severe thunderstorm event and potential tornadoes to develop from these storms.⁷

⁶ Treisman, Rachel. *The exact link between tornadoes and climate change is hard to draw. Here's why*. NPR. December 13, 2021. <https://www.npr.org/2021/12/13/1063676832/the-exact-link-between-tornadoes-and-climate-change-is-hard-to-draw-heres-why>

⁷ Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, Texas A&M University Office of the Texas State Climatologist, 2021 update.



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HAZARD DESCRIPTION

A wildfire event can rapidly spread out of control and occurs most often in the summer when the brush is dry, and flames can move unchecked through a highly vegetative area. Wildfires are prevalent in grasslands and shrublands, which constitute the vast majority of wildfire risks in the planning area. Grasslands and shrublands are important for the conservation of floral and faunal biodiversity. They also provide a wide range of additional ecosystem services, including carbon sequestration, flood control, soil erosion mitigation, and pasture for livestock. The comparatively low-to-moderate fuel loads that characterize grasslands and shrublands generate wildfires of relatively moderate intensity, resulting in moderate burn severity. Compared to forests, the availability of fuel in grasslands and shrublands is low, however, this fuel is very dry. Therefore, while fire intensity in this type of area is relatively low, fires can spread fast.

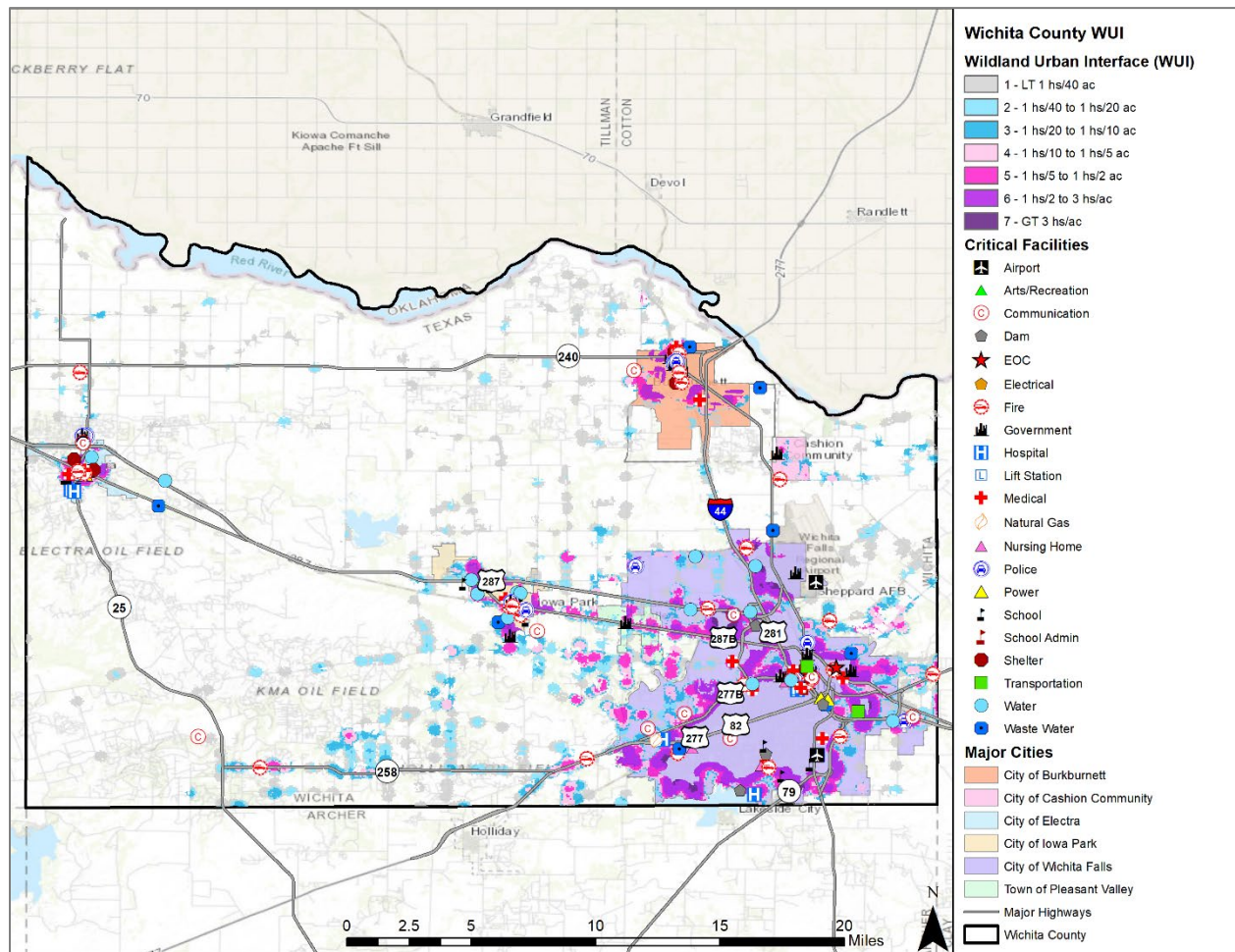
A wildfire event often begins unnoticed and spreads quickly, lighting brush, trees, and homes on fire. For example, a wildfire may be started by a campfire that was not doused properly, a tossed cigarette, burning debris, arson, or sparks caused by trailer chains and welding operations within the planning area. Texas has seen a significant increase in the number of wildfires in the past 30 years, which included wildland, interface, or intermix fires. Wildland fires are fueled almost exclusively by natural vegetation, while interface or intermix fires are urban / wildland fires in which vegetation and the built environment provide the fuel.

LOCATION

A wildfire event can be a potentially damaging consequence of drought conditions, lightning, or wind event, if the conditions allow. Wildfires can vary greatly in terms of size, location, intensity, and duration. While wildfires are not confined to any specific geographic location, they are most likely to occur in open grasslands. The threat to people and property from a wildfire event is greater in the fringe areas, where developed areas meet open grass lands, such as the Wildland Urban Interface (WUI). (Figures 12-1 through 12-7). It is estimated that 36.7 percent of the total population in the Wichita County planning area live within the WUI. However, the entire planning area is at some risk for wildfires.

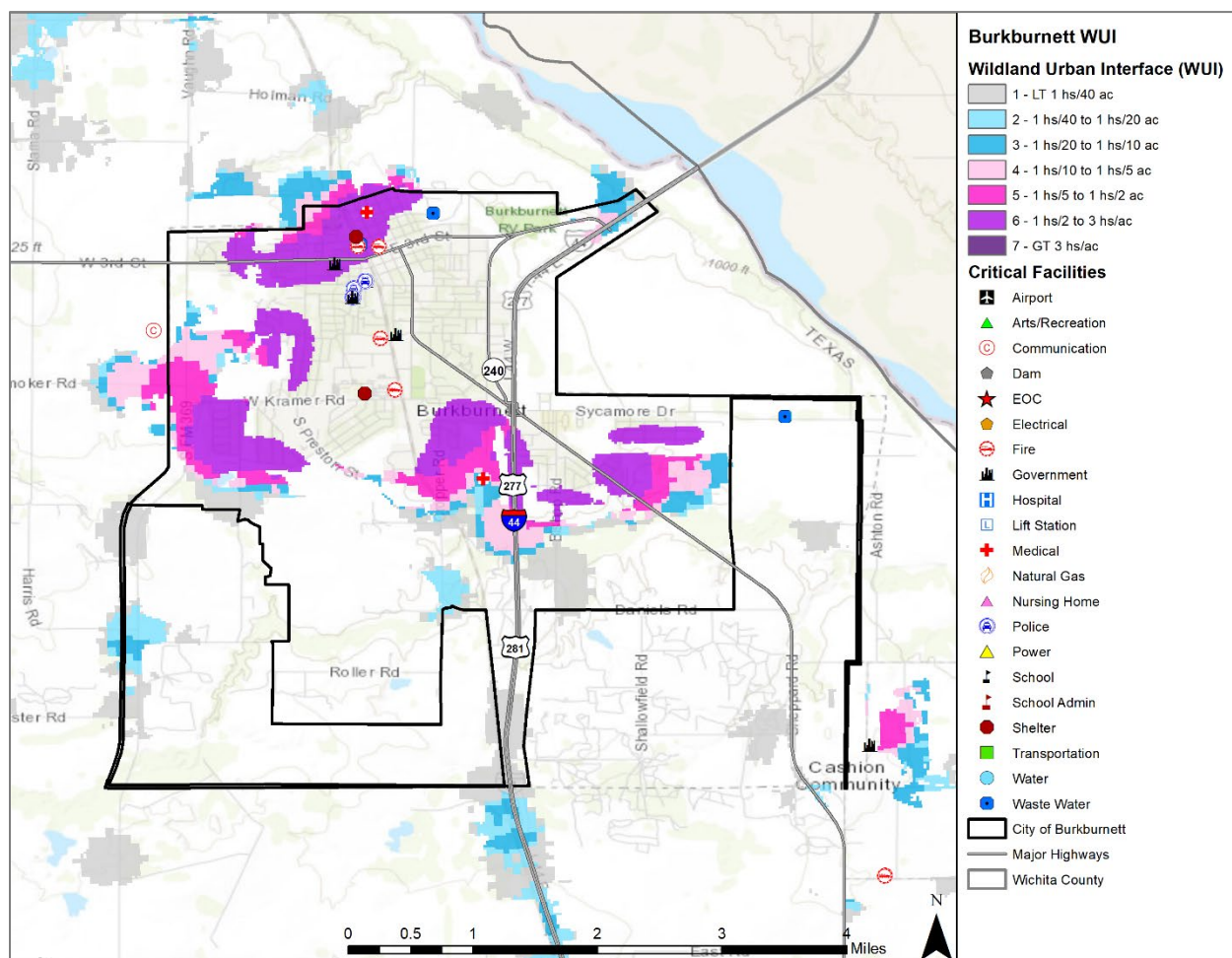
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Figure 12-1. Wildland Urban Interface Map – Wichita County



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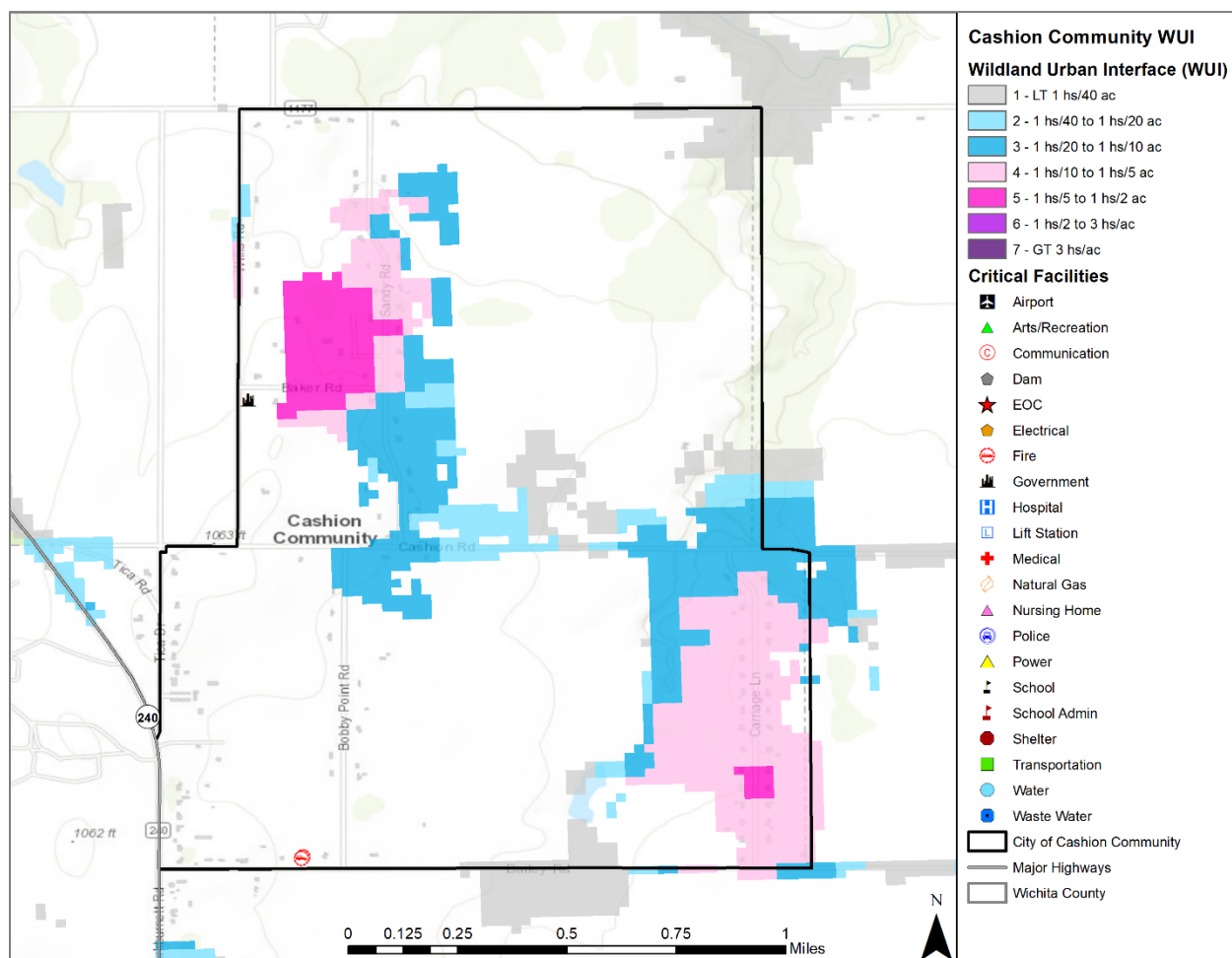
Figure 12-2. Wildland Urban Interface Map – City of Burkburnett



It is estimated that 34.7 percent of the total population in the City of Burkburnett live within the WUI. However, the entire community is at some risk for wildfires.

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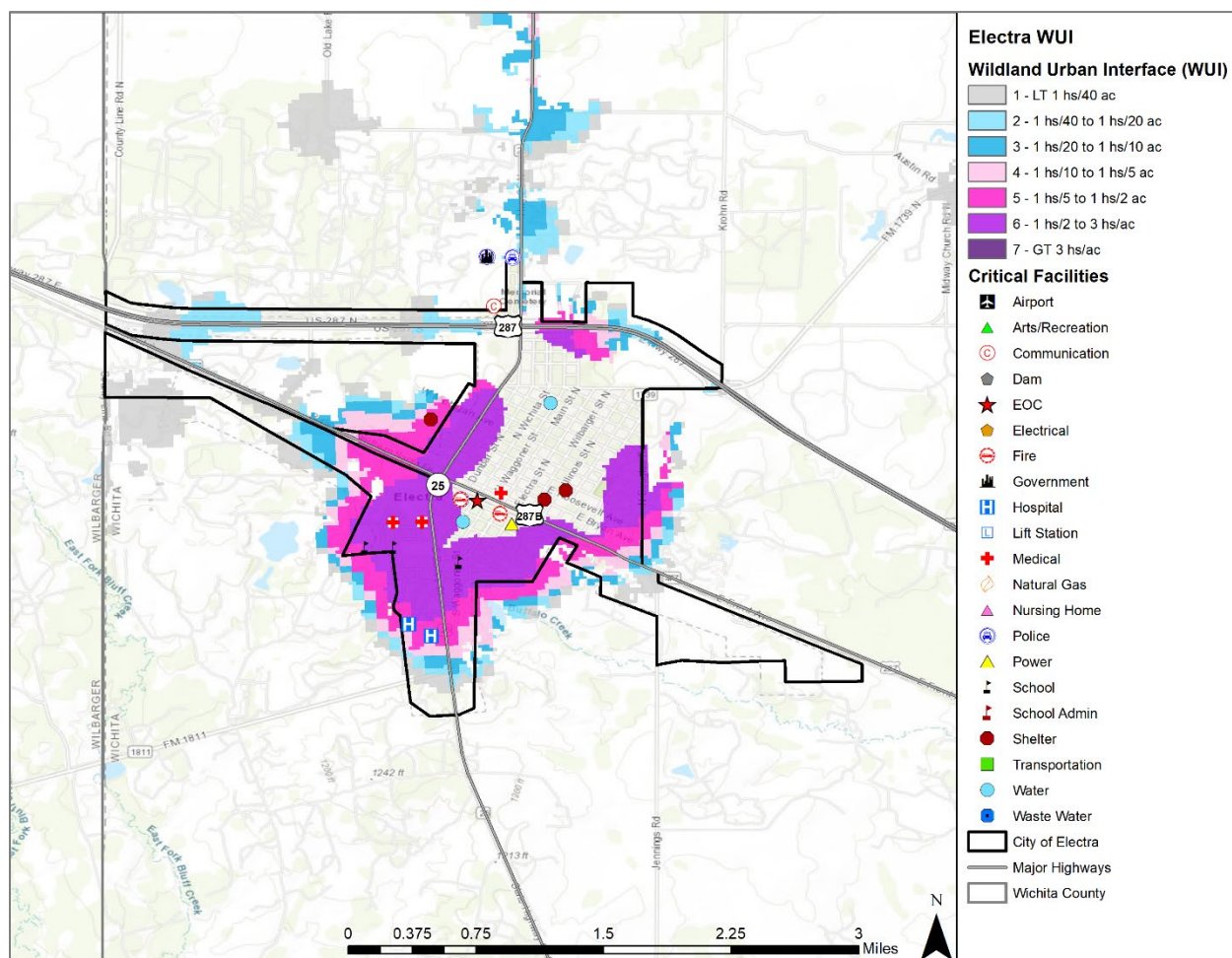
Figure 12-3. Wildland Urban Interface Map – City of Cashion Community



It is estimated that 57.9 percent of the total population in the City of Cashion Community live within the WUI. However, the entire community is at some risk for wildfires.

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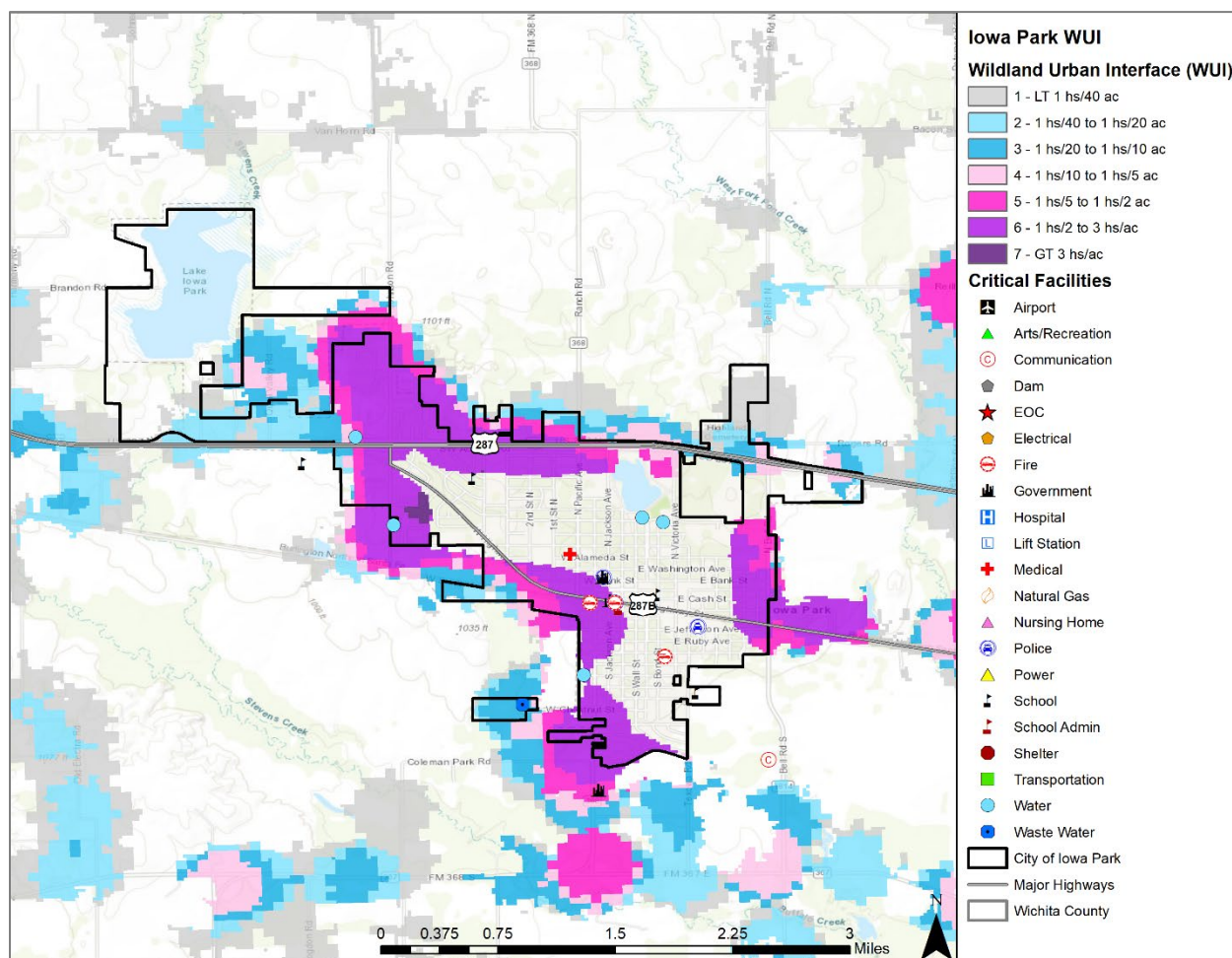
Figure 12-4. Wildland Urban Interface Map – City of Electra



It is estimated that 52.5 percent of the total population in the City of Electra live within the WUI. However, the entire community is at some risk for wildfires.

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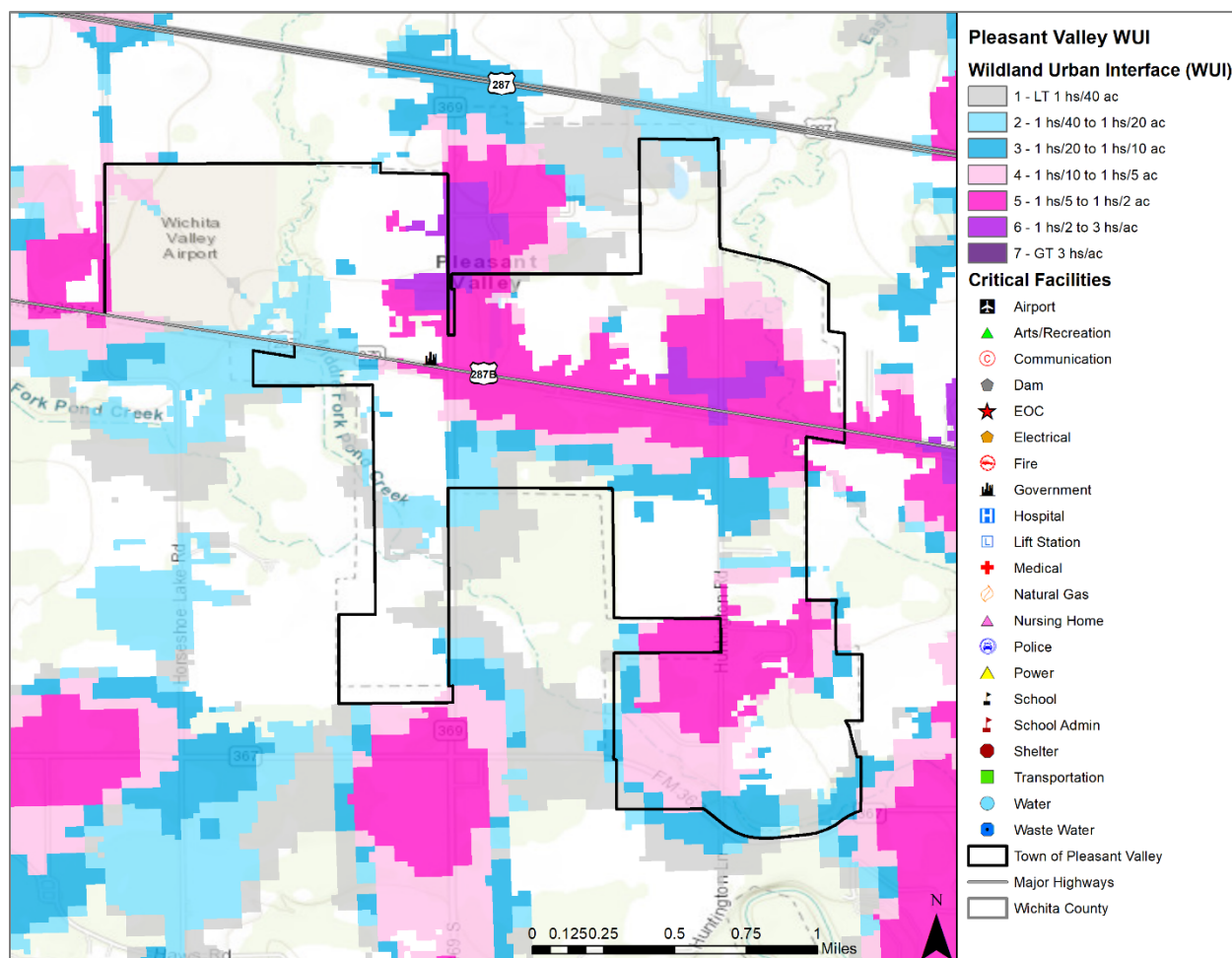
Figure 12-5. Wildland Urban Interface Map – City of Iowa Park



It is estimated that 43.3 percent of the total population in the City of Iowa Park live within the WUI. However, the entire community is at some risk for wildfires.

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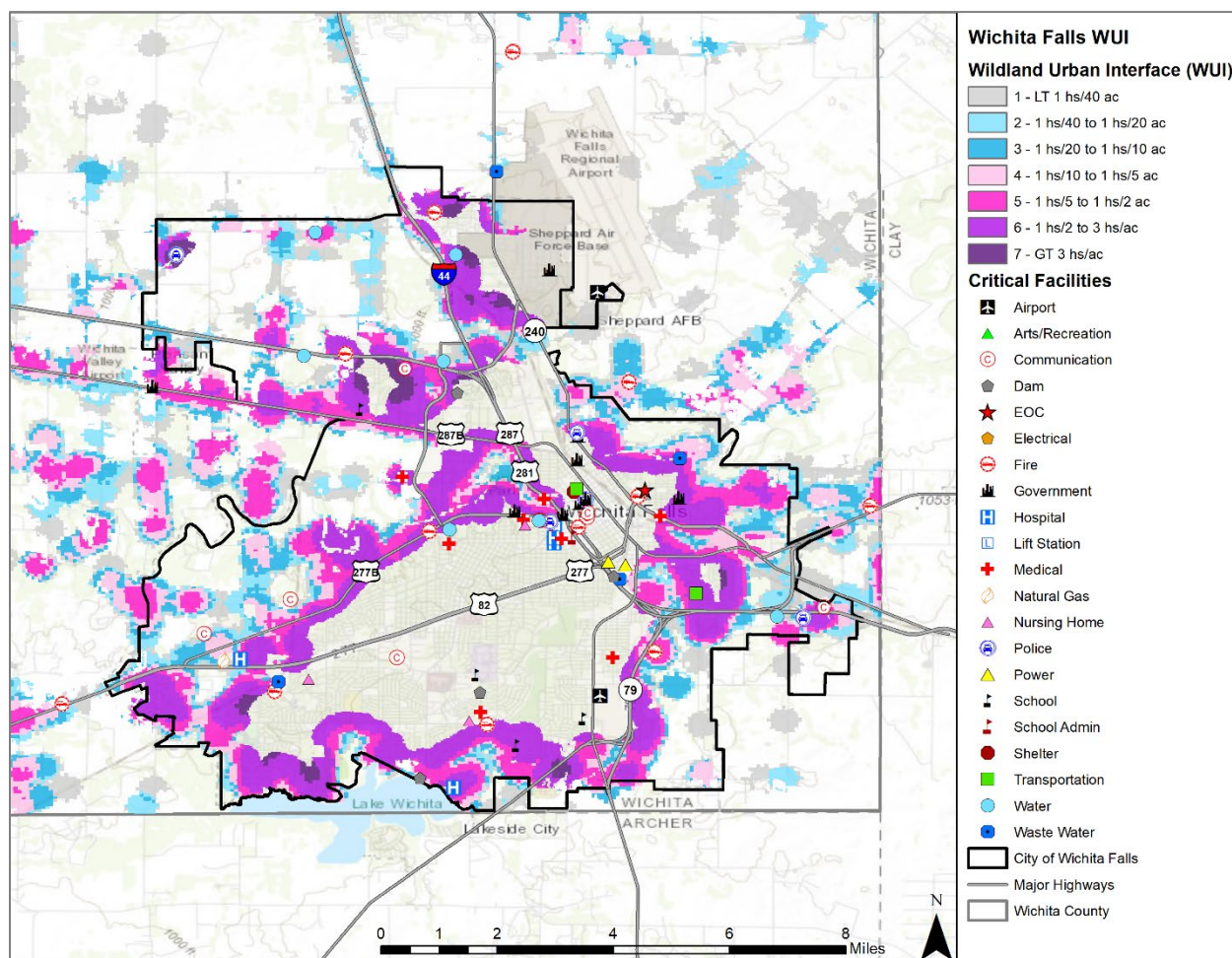
Figure 12-6. Wildland Urban Interface Map – City of Pleasant Valley



It is estimated that 88.4 percent of the total population in the City of Pleasant Valley live within the WUI. However, the entire community is at some risk for wildfires.

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Figure 12-7. Wildland Urban Interface Map – City of Wichita Falls



It is estimated that 32.8 percent of the total population in the City of Wichita Falls live within the WUI. However, the entire community is at some risk for wildfires.

EXTENT

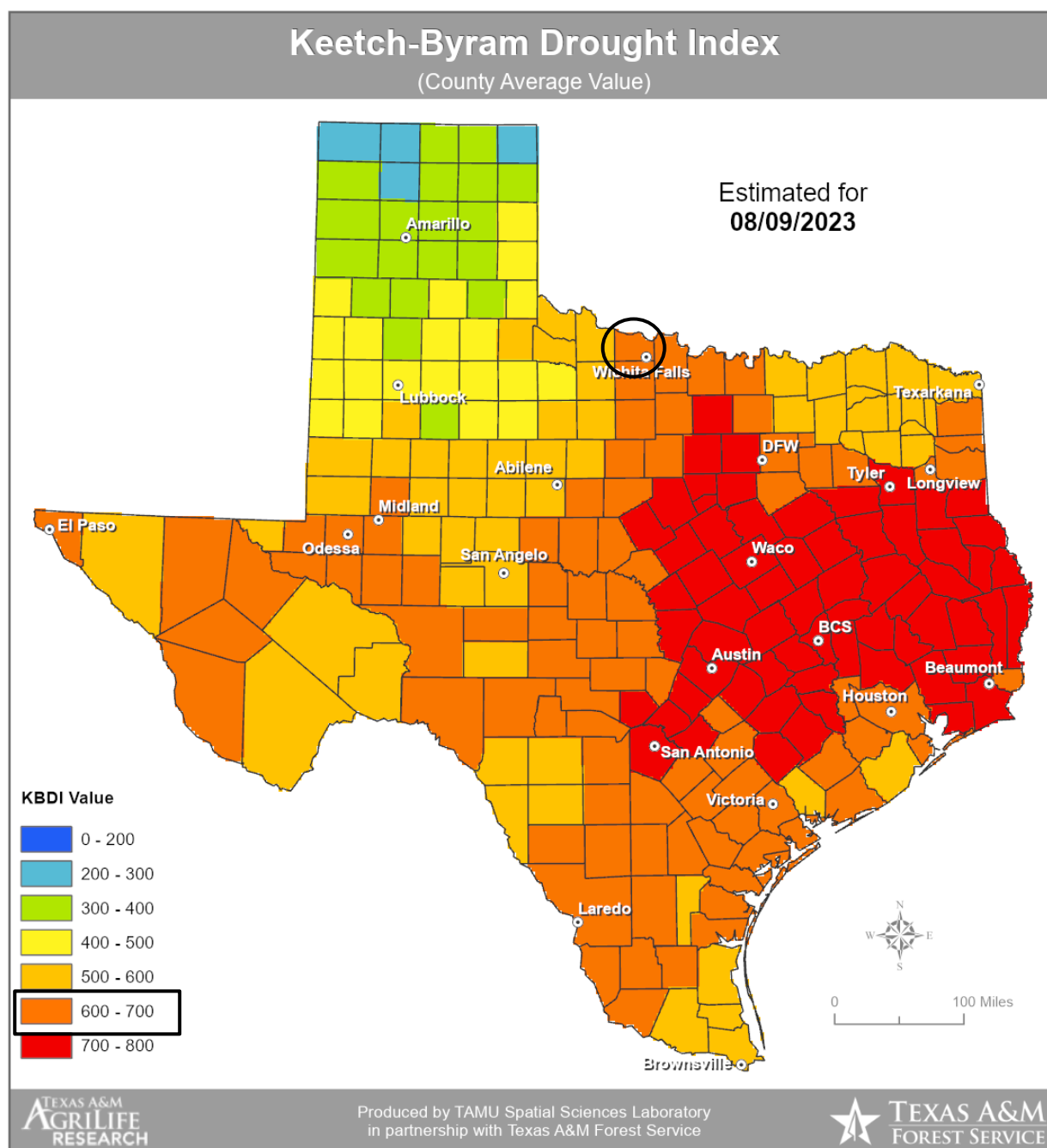


Risk for a wildfire event is measured in terms of magnitude and intensity using the Keetch Byram Drought Index (KBDI), a mathematical system for relating current and recent weather conditions to potential or expected fire behavior. The KBDI determines forest fire potential based on a daily water balance, derived by balancing a drought factor with precipitation and soil moisture (assumed to have a maximum storage capacity of eight inches), and is expressed in hundredths of an inch of soil moisture depletion.

Each color in Figure 12-8 represents the drought index at that location. The drought index ranges from 0 to 800. A drought index of 0 represents no moisture depletion, and a drought index of 800 represents absolutely dry conditions.

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Figure 12-8. Keetch-Byram Drought Index (KBDI) for the State of Texas, 2023¹



Fire behavior can be categorized at four distinct levels on the KBDI:

- **0 -200:** Soil and fuel moisture are high. Most fuels will not readily ignite or burn. However, with sufficient sunlight and wind, cured grasses and some light surface fuels will burn in spots and patches.

¹ Wichita County planning area is located within the black circle.

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- **200 -400:** Fires more readily burn and will carry across an area with no gaps. Heavier fuels will not readily ignite and burn. Expect smoldering and the resulting smoke to carry into and possibly through the night.
- **400 -600:** Fires intensity begins to significantly increase. Fires will readily burn in all directions exposing mineral soils in some locations. Larger fuels may burn or smolder for several days creating possible smoke and control problems.
- **600 -800:** Fires will burn to mineral soil. Stumps will burn to the end of underground roots and spotting will be a major problem. Fires will burn through the night and heavier fuels will actively burn and contribute to fire intensity.

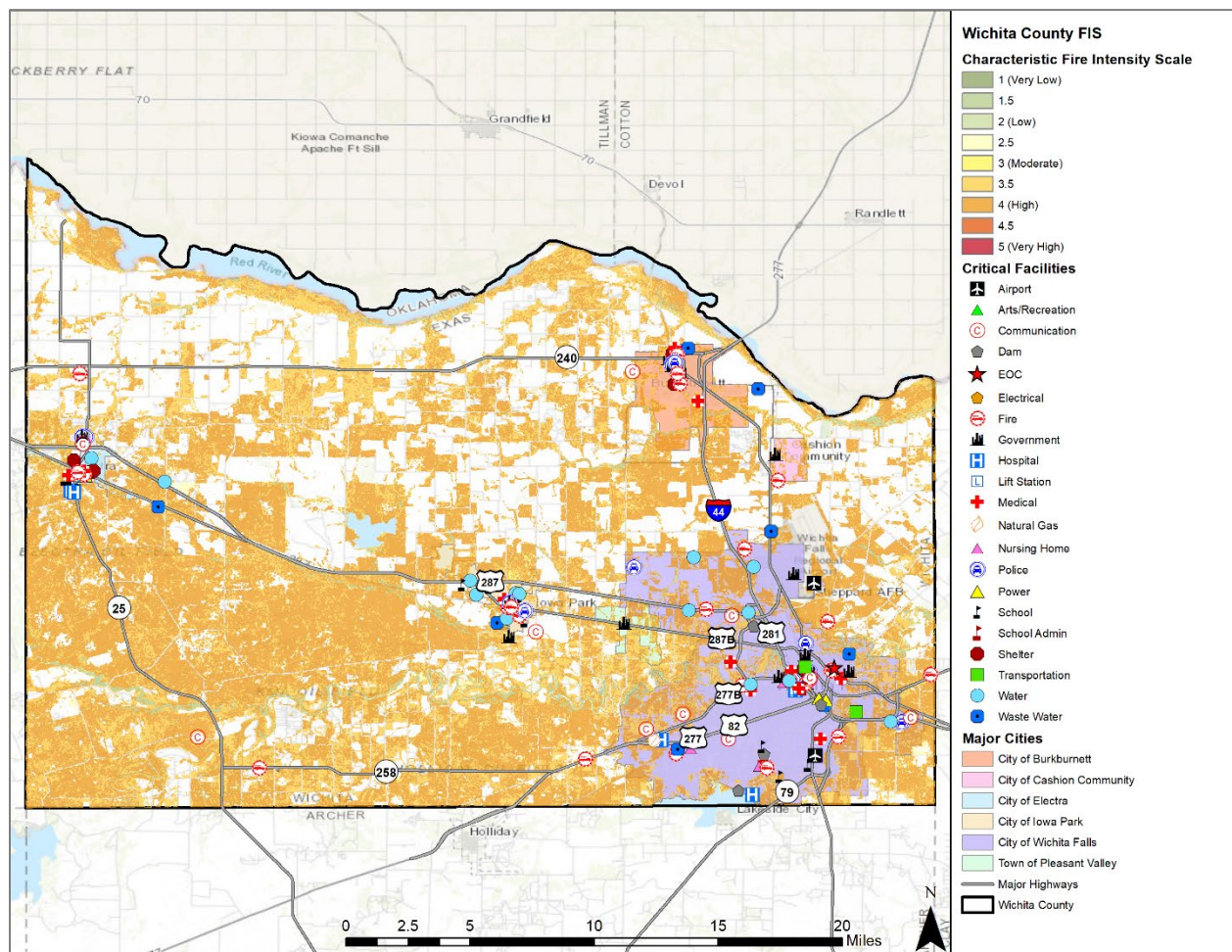
The KBDI is a good measure of the readiness of fuels for a wildfire event. It should be referenced as the area experiences changes in precipitation and soil moisture, while caution should be exercised in dryer, hotter conditions.

The range of intensity for the Wichita County planning area, including participating jurisdictions, in a wildfire event is within 124 to 790. The average extent to be mitigated for the planning area is a KBDI of 522. At this level fires intensity begins to significantly increase. Fire will readily burn in all directions exposing mineral soils in some locations. Based on historical occurrences and readily available fuel, the planning area can anticipate a KBDI maximum extent of 790. At this level fires will burn to mineral soil. Stumps will burn to the end of underground roots and spotting will be a major problem. Fires will burn through the night and heavier fuels will actively burn and contribute to fire intensity.

The Texas A&M Forest Service's Fire Intensity Scale identifies areas where significant fuel hazards and associated dangerous fire behavior potential exist based on weighted average of four percentile weather categories. The Wichita County planning area has a potential for limited to moderate wildfire intensities. Figure 12-9 through 12-15 identifies the wildfire intensity for the planning area, including all participating jurisdictions.

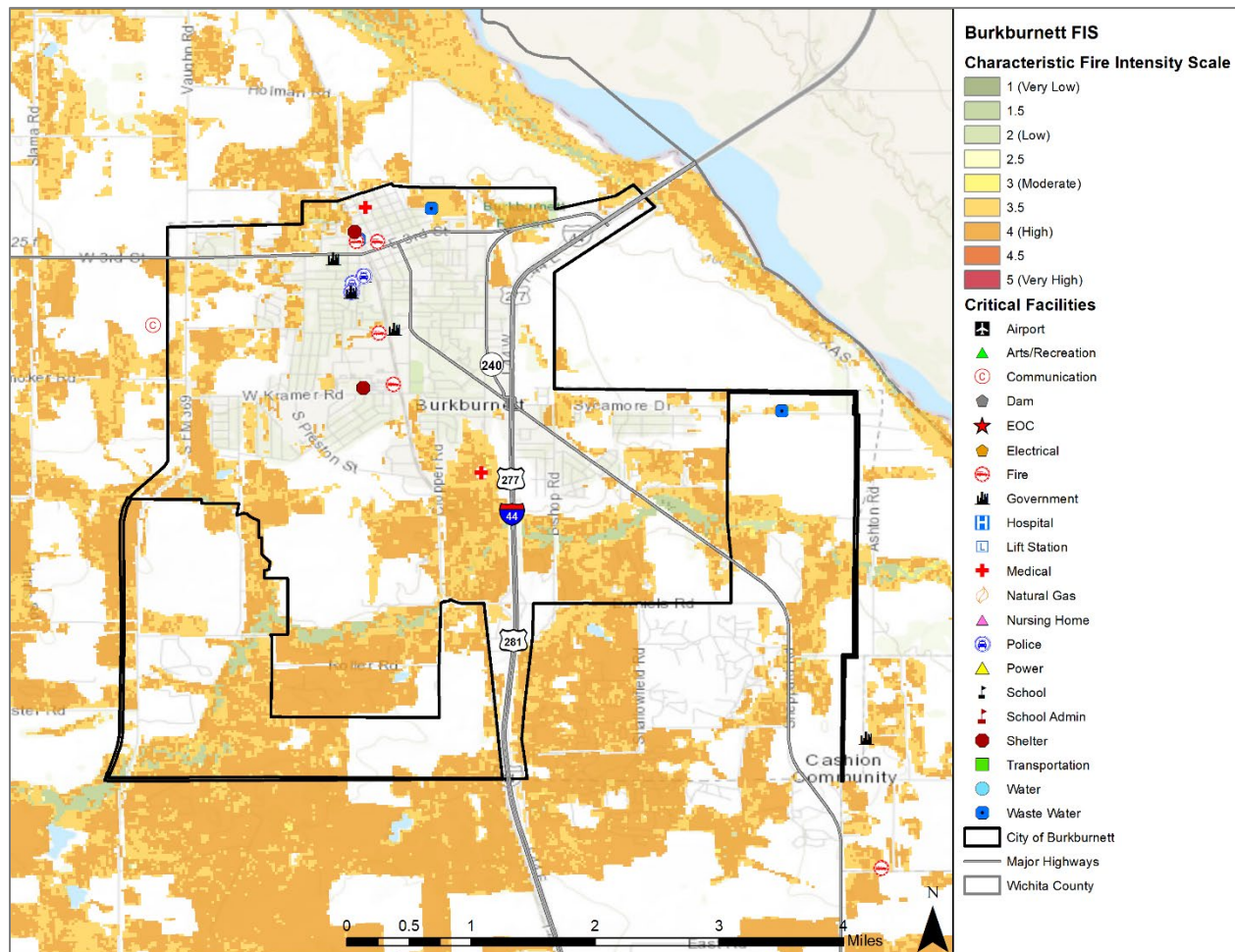
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Figure 12-9. Fire Intensity Scale Map – Wichita County



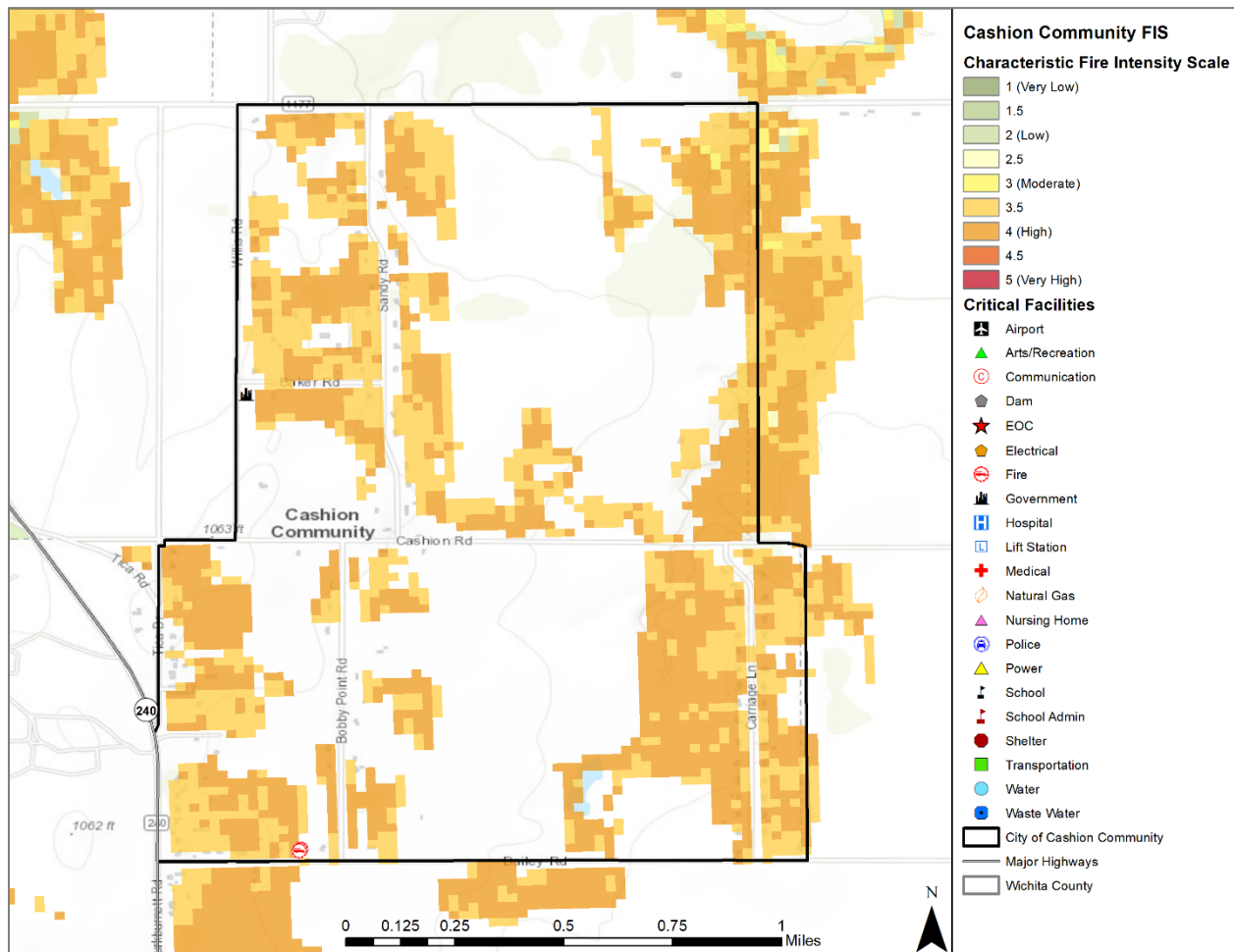
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Figure 12-10. Fire Intensity Scale Map – City of Burkburnett



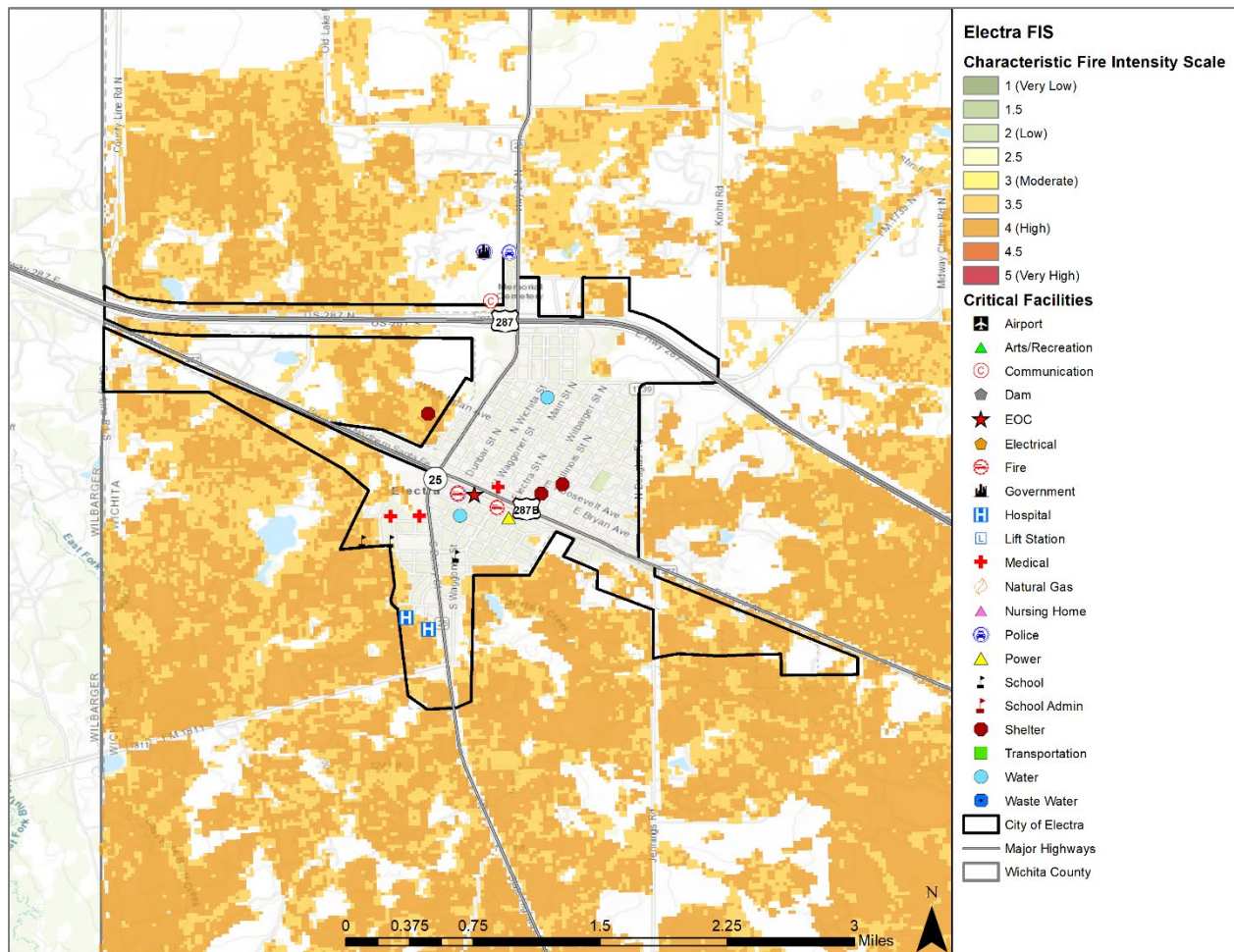
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Figure 12-11. Fire Intensity Scale Map – City of Cashion Community



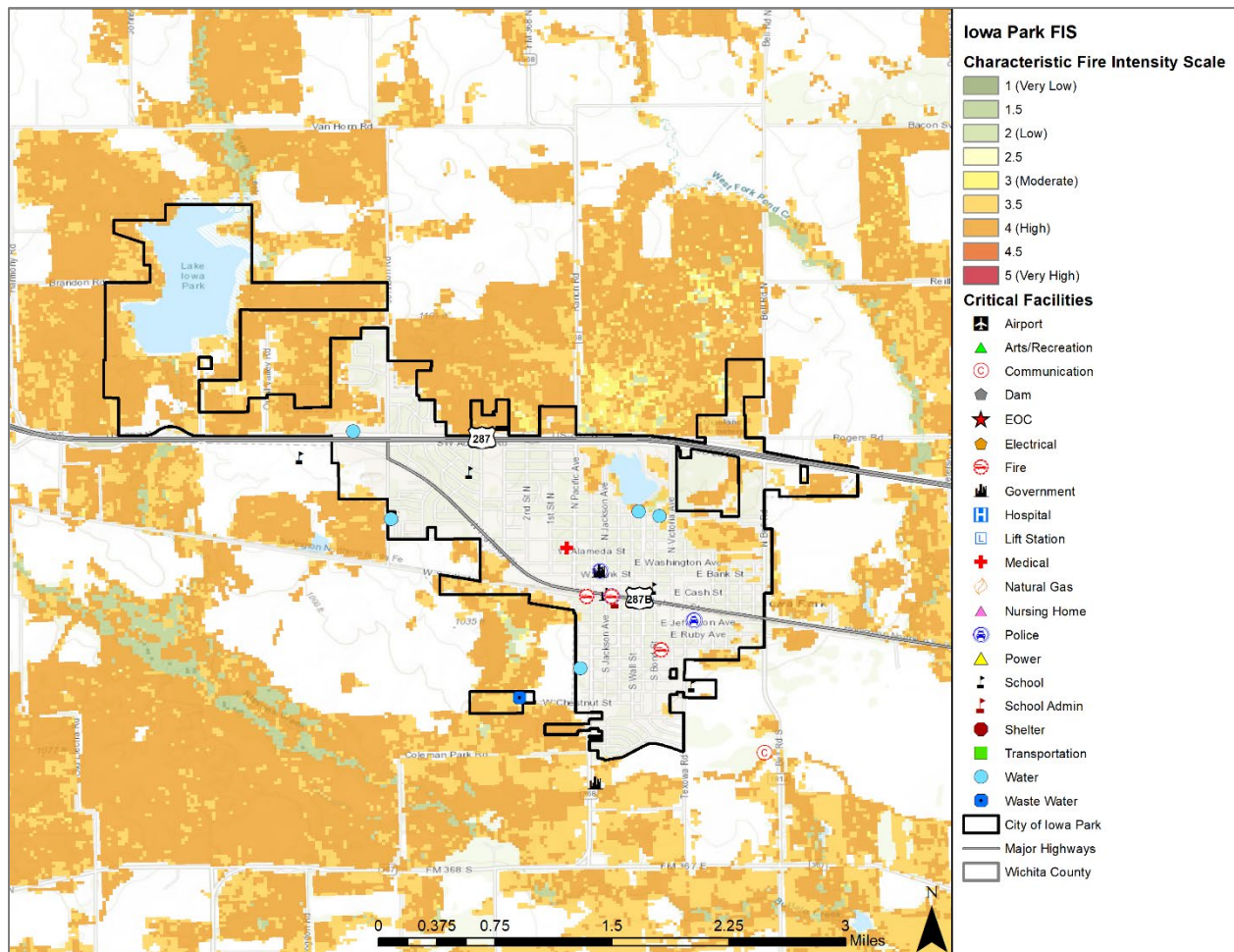
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Figure 12-12. Fire Intensity Scale Map – City of Electra



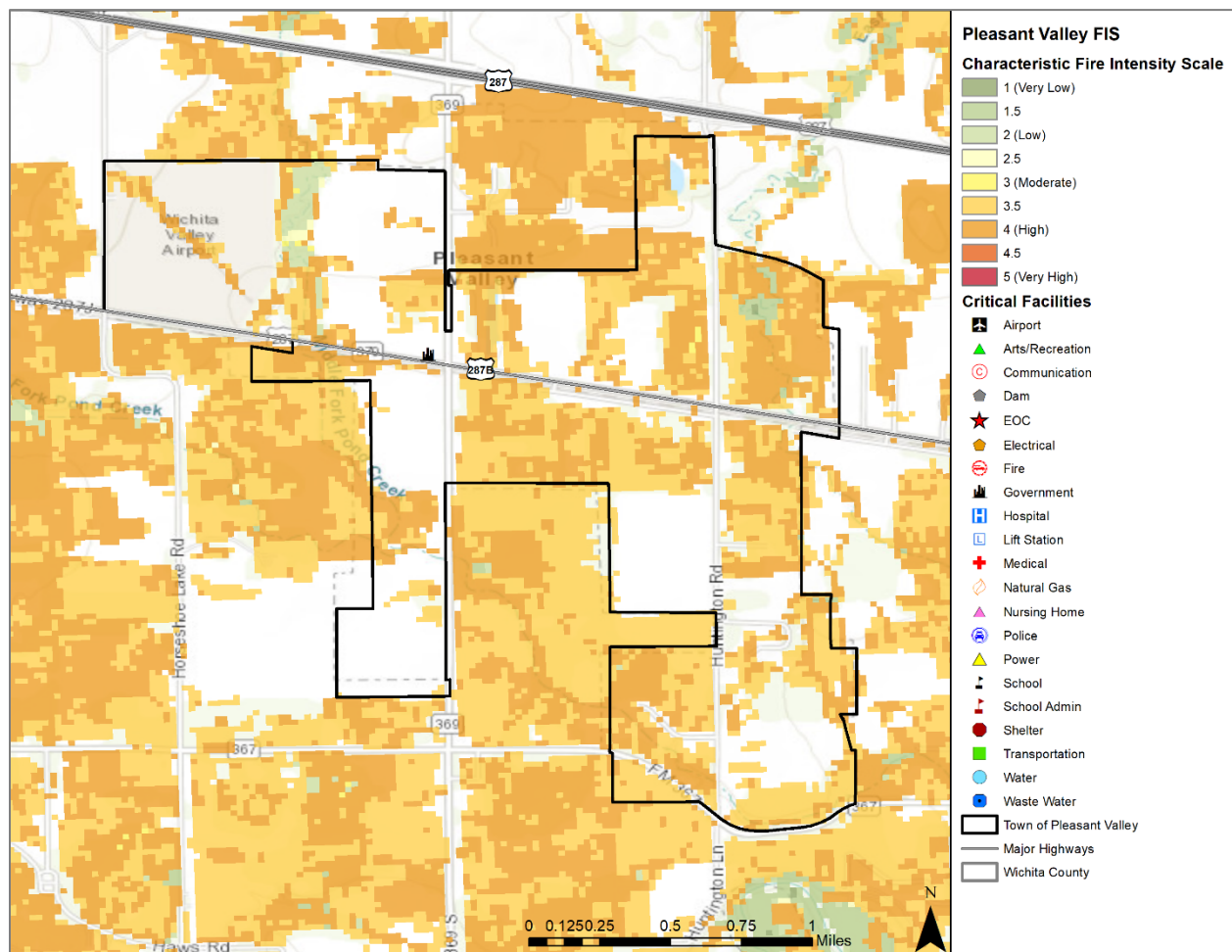
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Figure 12-13. Fire Intensity Scale Map – City of Iowa Park



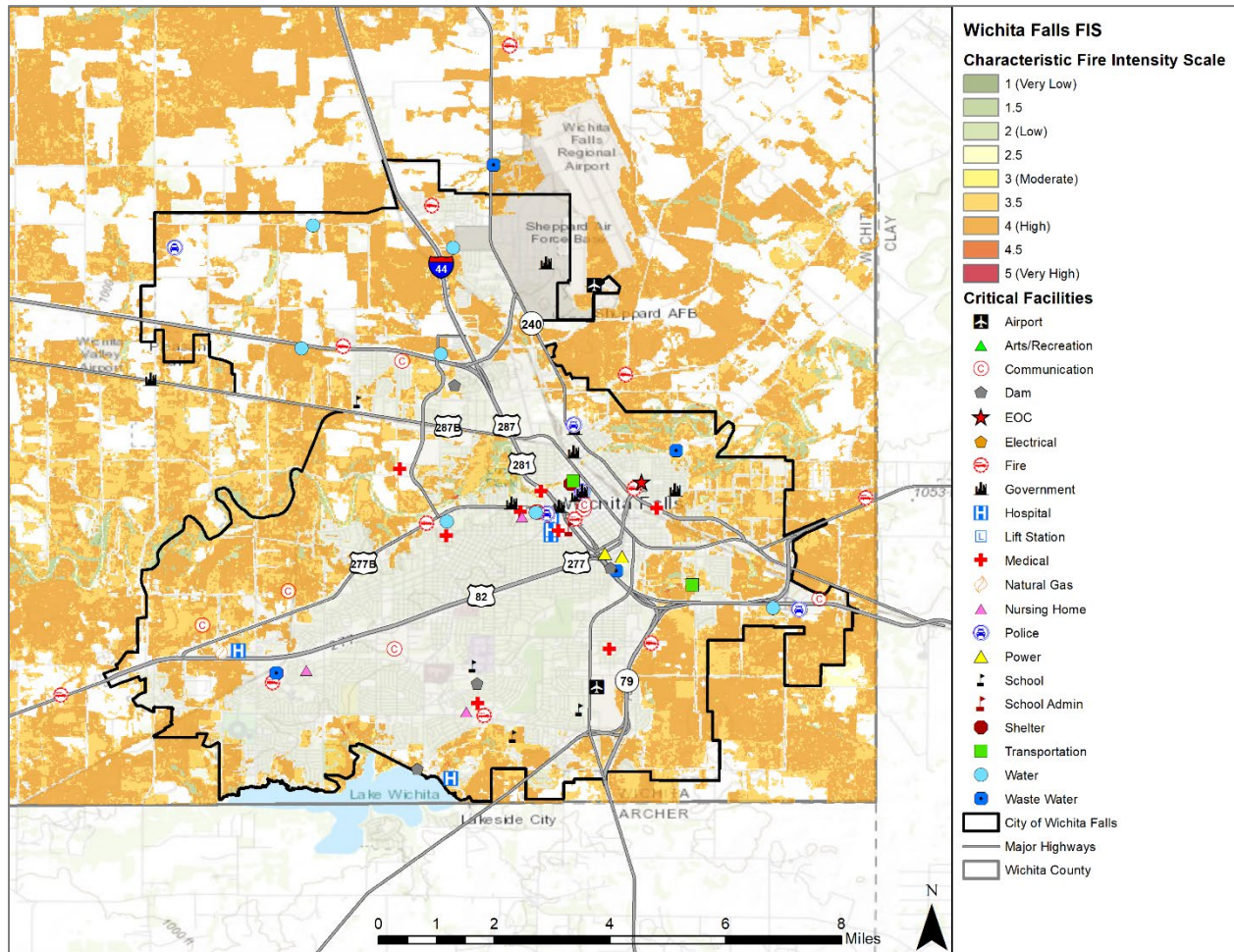
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Figure 12-14. Fire Intensity Scale Map – City of Pleasant Valley



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Figure 12-15. Fire Intensity Scale Map – City of Wichita Falls



HISTORICAL OCCURRENCES

The Texas A&M Forest Service reported 3,134 wildfire events between 2005 and 2021. The National Centers for Environmental Information (NCEI) included two wildfire events during this period, which are accounted for in the Texas A&M Forest Service reporting. The Texas A&M Forest Service (TAMFS) started collecting wildfire reported by volunteer fire departments in 2005. Due to a lack of recorded data for wildfire events prior to 2005 and after 2021, frequency calculations are based on a 17-year reporting period, using only data from recorded years. The map below shows approximate locations of wildfires, which can be grass or brushfires of any size (Figure 12-16). Table 12-1 and 12-2 identifies the number of wildfires and total acreage burned each year within the county boundaries.

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Figure 12-16. Location and Historic Wildfire Events for Wichita County

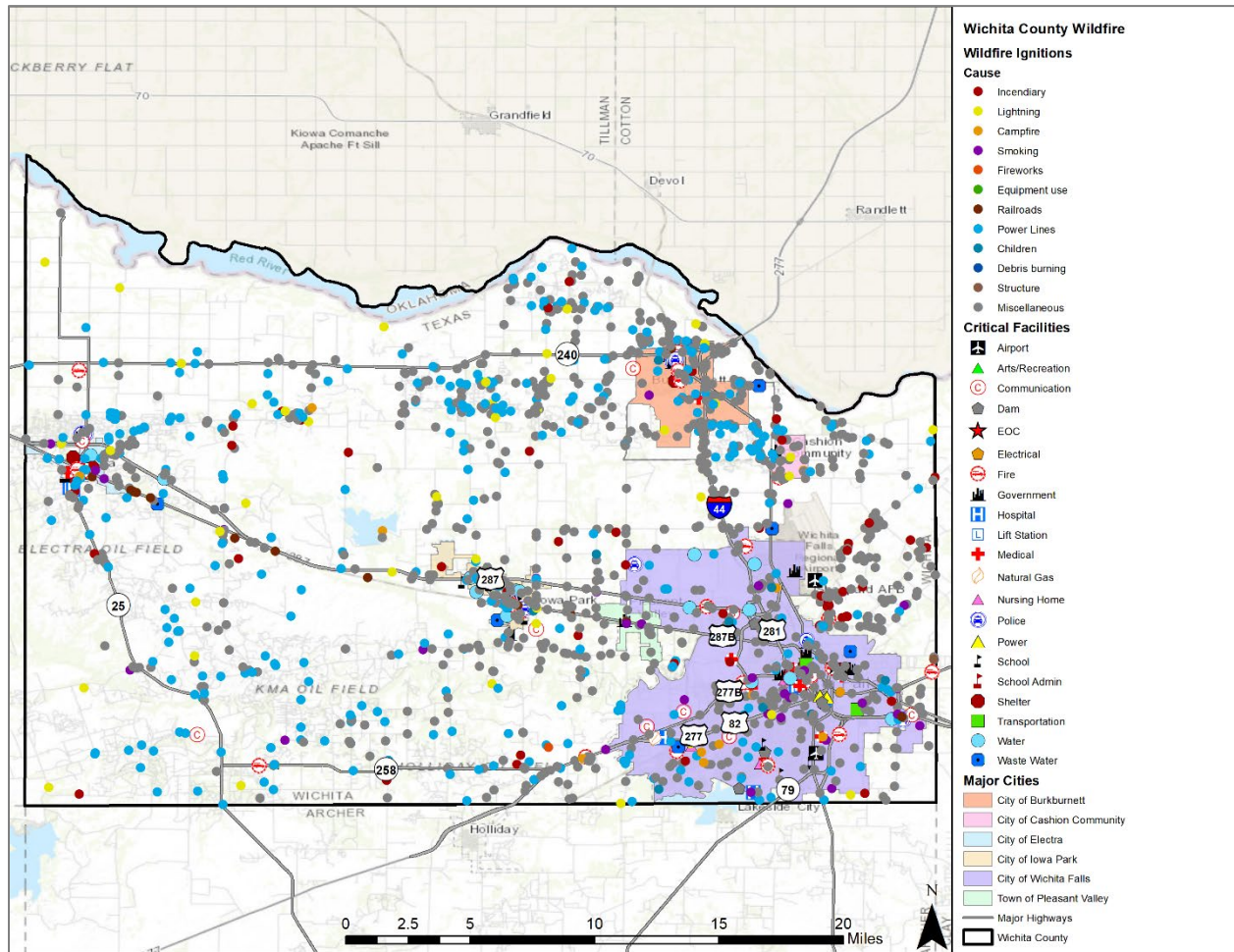


Table 12-1. Historical Wildfire Events Summary, 2005 - 2021

JURISDICTION	NUMBER OF EVENTS	ACRES BURNED
Wichita County	2,294	88,962
City of Burkburnett	123	500
City of Cashion	34	263
City of Electra	41	5,832
City of Iowa Park	90	676
City of Pleasant Valley	17	135
City of Wichita Falls	535	5,418

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Table 12-2. Historical Wildfire Events by Year

Year	Wichita County	City of Burkburnett	City of Cashion Community	City of Electra	City of Iowa Park	City of Pleasant Valley	City of Wichita Falls
2005	42	3	1	0	4	3	3
2006	198	13	1	9	9	0	3
2007	5	0	1	0	0	0	0
2008	172	15	4	0	3	0	3
2009	121	5	3	2	6	2	6
2010	71	2	0	4	0	0	8
2011	440	12	2	11	31	1	115
2012	370	11	4	11	13	5	195
2013	231	6	1	2	12	1	136
2014	70	2	0	0	7	2	34
2015	40	3	2	0	1	0	0
2016	57	5	3	0	1	0	8
2017	28	3	1	0	0	0	1
2018	120	7	1	0	3	2	11
2019	77	10	4	1	0	0	7
2020	125	9	2	0	0	1	5
2021	127	17	4	1	0	0	0
							Total: 3,134

Table 12-3. Acreage of Suppressed Wildfire by Year

Year	Wichita County	City of Burkburnett	City of Cashion Community	City of Electra	City of Iowa Park	City of Pleasant Valley	City of Wichita Falls
2005	4,958	1	0	0	8	83	3
2006	7,568	12	20	232	12	0	112
2007	85	0	10	0	0	0	0
2008	16,720	47	96	0	7	0	191

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Year	Wichita County	City of Burkburnett	City of Cashion Community	City of Electra	City of Iowa Park	City of Pleasant Valley	City of Wichita Falls
2009	8,943	8	54	4,700	3	1	1,513
2010	1,426	4	0	21	0	0	7
2011	29,162	18	45	835	65	1	2,279
2012	5,330	30	4	42	25	42	554
2013	999	102	1	0	14	0	226
2014	529	2	0	0	5	2	335
2015	1,972	1	1	0	500	0	0
2016	429	1	2	0	20	0	10
2017	143	3	1	0	0	0	0
2018	3,302	14	10	0	17	3	24
2019	1,106	27	7	1	0	0	6
2020	1,402	203	8	0	0	3	158
2021	4,888	27	4	1	0	0	0
							Total: 104,920

Based on the list of historical wildfire events for the Wichita County planning area (listed above), 567 events have occurred since the 2018 Plan.

SIGNIFICANT EVENTS

There have been 10 federally declared disasters related to wildfire between January 1996 and June 2023 (Table 12-4). Additional details on certain wildfire events are described below.

Table 12-4. Disaster Declarations for Wildfire, 1996-2023

YEAR	DECLARATION TITLE	DECLARATION TYPE	DISASTER NO.
1993	Extreme Fire Hazard	Drought	EM-3113
1996	Extreme Fire Hazard	Fire	EM-3117
1999	Extreme Fire Hazards	Fire	EM-3142
2006	Extreme Wildfire Threat	Fire	DR-1624
2008	Wildfires	Fire	EM-3284
2009	Electra West Fire	Fire	FM-2805

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YEAR	DECLARATION TITLE	DECLARATION TYPE	DISASTER NO.
2011	Wichita Fire Complex	Fire	FM-2891
2011	Sisk Road Fire	Fire	FM-2905
2011	Wildfires	Fire	DR-1999
2022	County Line Fire	Fire	FM-5420

December 10, 2021 – Wichita County / City of Electra

A strong storm system with a tight pressure gradient led to high winds across much of western Oklahoma and western North Texas. Several fires were reported during the afternoon of the 10th, with numerous structures burned including the Electra Complex fire, which burned roughly 2,300 acres and 3 structures.

April 15-20, 2011 – Wichita County – Wichita Complex Fire (FM-2891)

The Wichita Complex Fire started in mid-April amongst exceptionally dry vegetation, warm temperatures, low humidity, and high winds. The fire consumed more than 11,785 acres and destroyed 20 homes before being contained. Due to the severity of the event, volunteer fire departments across the area, in addition to Sheppard Air Force Base, Texas Panhandle and the State of Oklahoma assisted in response to the event. It was reported that it took over 8 hours to contain the fire. The event received a Fire Management Assistance Declaration (FM-2891), providing financial assistance for fire suppression efforts in the affected area.

July 6, 2000 – Wichita County / City of Wichita Falls

A wildfire developed just outside the city limits of Wichita Falls on the east side near Harding Street, and started when a resident in the area began to burn trash in his back yard. The dry conditions and strong winds allowed the fire to spread rapidly northward up a hill toward Mesa Street. Dozens of acres of pasture burned, along with 13 older unoccupied homes, outbuildings, sheds, and 2 vehicles. Several hours were required to gain control of the fire which received assistance from 14 volunteer fire departments. Two firefighters suffered heat stroke and were taken to a local hospital for treatment.

PROBABILITY OF FUTURE EVENTS

Wildfires can occur at any time of the year. As Wichita County communities move into wildland, the potential area of occurrence of wildfire increases. With 3,134 events in a 17-year period, an event within the Wichita County planning area is highly likely, meaning an event is probable within the next year. According to NOAA, research shows that changes in climate create warmer, drier conditions, leading to longer and more active fire seasons, indicating an increase in the frequency and severity of events in the planning area going forward. See additional information on climate change at the end of this section.

VULNERABILITY AND IMPACT

Periods of drought, dry conditions, high temperatures, and low humidity are factors that contribute to the occurrence of a wildfire event. Areas along railroads and people whose homes are in woodland settings have an increased risk of being affected by wildfire.

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The more heavily populated areas of the planning area, like the City of Wichita Falls, are not likely to experience large, sweeping fires. Unoccupied buildings and open spaces that have not been maintained have the greatest vulnerability to wildfire. The overall level of concern for wildfires is located mostly along the perimeter of the study area where wildland and urban areas interface. Figure 12-1 through 12-7 illustrates the areas that are the most vulnerable to wildfire throughout the Wichita County planning area, including all participating jurisdictions. Areas along undeveloped stretches of highway like Highway 287 between the Cities of Electra and Iowa Park, FM 240 west of the City of Burkburnett, or Interstate 44 between the Cities of Wichita Falls and Burkburnett have an increased vulnerability where empty lots and unoccupied areas are located.

The Wichita County Planning Team identified the following critical facilities as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by wildfire events. For a comprehensive list by participating jurisdiction see Appendix C.

Table 12-5. Critical Facilities Vulnerable to Wildfire Events

CRITICAL FACILITIES	POTENTIAL IMPACTS
<p>Emergency Response Departments (EOC, Fire, Police, EMS, Hospitals)</p> <p>(12 Fire Stations, 6 Police Stations, 15 Health Care Facilities located in WUI)</p>	<ul style="list-style-type: none"> Emergency services may be disrupted during a wildfire if facilities are impacted, roadways are inaccessible, or personnel are unable to report for duty. First responders are at greater risk of injury when in close proximity to the hazard while extinguishing flames, protecting property, or evacuating residents in the area. Critical city departments may not be able to function and provide necessary services depending on the location of the fire and the structures or personnel impacted. Roadways in or near the WUI could be damaged or closed due to smoke and limited visibility, slowing or preventing access for emergency response vehicles. Fire suppression costs can be substantial, exhausting the financial resources of the community. First responders can experience heart disease, respiratory problems, and other long-term related illnesses from prolonged exposure to smoke, chemicals, and heat. Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. Power outages could disrupt communications, delaying emergency response times. Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. Structures can be damaged or destroyed in the path of the wildfire. Power outages could disrupt critical care. Backup power sources could be damaged.
<p>Airport, Academic Institutions, Community Residential Facilities, Day Care Facilities,</p>	<ul style="list-style-type: none"> Facilities or infrastructure may be damaged, destroyed or otherwise inaccessible. Essential supplies like medicines, water, food, and equipment deliveries may be significantly delayed.

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CRITICAL FACILITIES	POTENTIAL IMPACTS
Evacuation Centers & Shelters, Governmental Facilities (5 Government Facilities, 6 School Facilities, 2 Shelter Facilities located in the WUI)	<ul style="list-style-type: none"> Additional emergency responders and critical aid workers may not be able to reach the area for days. Power outages and infrastructure damage may prevent government facilities from acting as temporary command centers for logistics, communications, and emergency operations.
Utility Services and Infrastructure (electric, water, wastewater, communications) (3 Communication Towers, 1 Dam, 1 Natural Gas Maintenance Facility, 1 Transportation Facility, 9 Water/Wastewater Facilities located in the WUI)	<ul style="list-style-type: none"> Wastewater and drinking water facilities and infrastructure may be damaged or destroyed resulting in service disruption or outage for multiple days or weeks. Disruptions and outages impact public welfare as safe drinking water is critical. A break in essential and effective wastewater collection and treatment is a health concern, potentially spreading disease. Exposure to untreated wastewater is harmful to people and the environment. Any service disruptions can negatively impact or delay emergency management operations. Power losses

Within the Wichita County planning area, a total of 3,134 fire events were reported from 2005 through 2021. All of these events were suspected wildfires. Historic loss and annualized estimates due to wildfires are presented in Table 12-6 below. The average frequency is approximately 184 events every year.

Table 12-6. Potential Annualized Acreage Losses²

JURISDICTION	TOTAL ACRES BURNED	AVERAGE ANNUAL ACRE LOSSES
Wichita County	88,962	5,233.1
City of Burkburnett	500	29.4
City of Cashion Community	263	15.5
City of Electra	5,832	343.1
City of Iowa Park	676	39.8

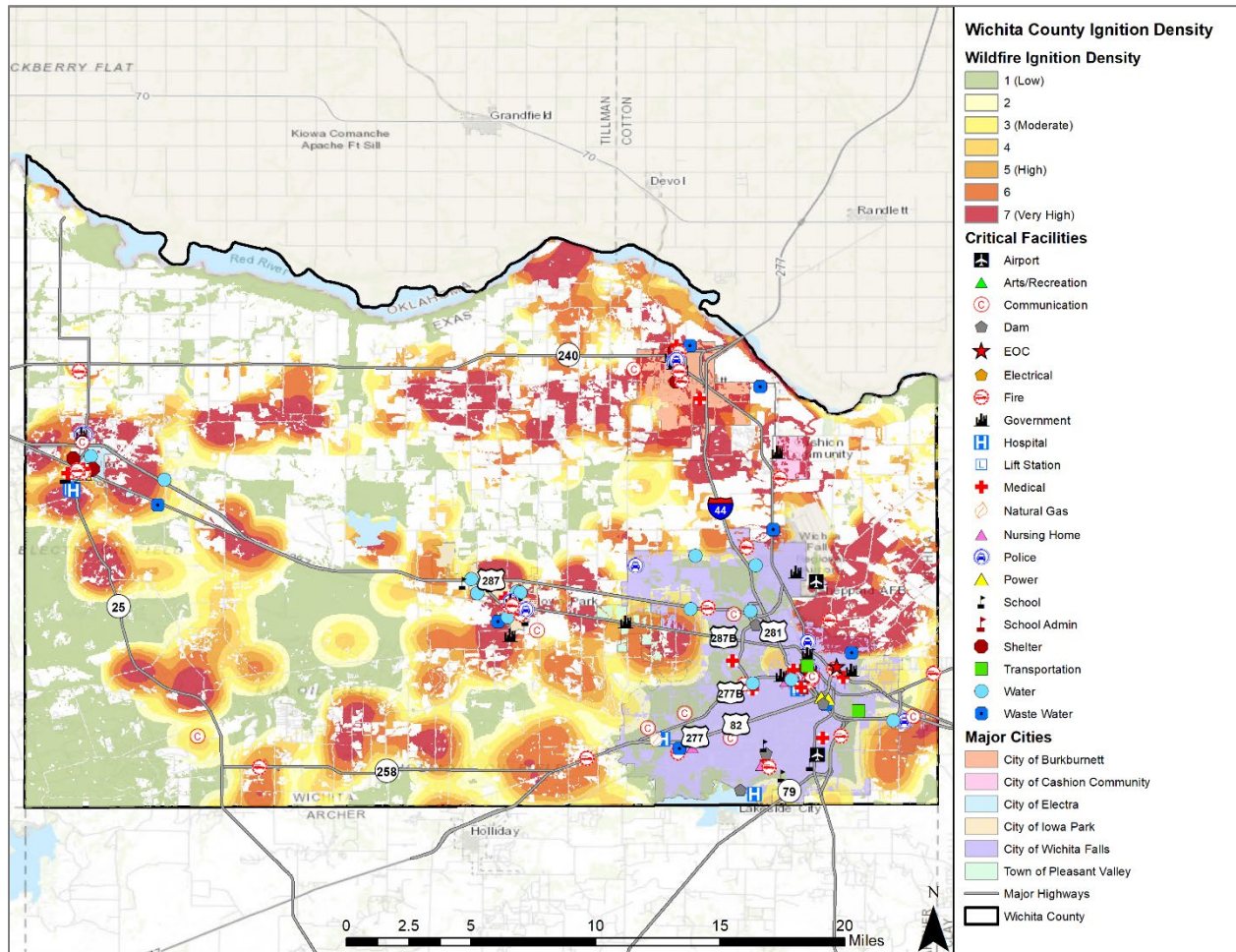
² Events divided by 17 years of data.

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JURISDICTION	TOTAL ACRES BURNED	AVERAGE ANNUAL ACRE LOSSES
City of Pleasant Valley	135	7.9
City of Wichita Falls	5,418	318.7
TOTAL	101,786	5,987.4

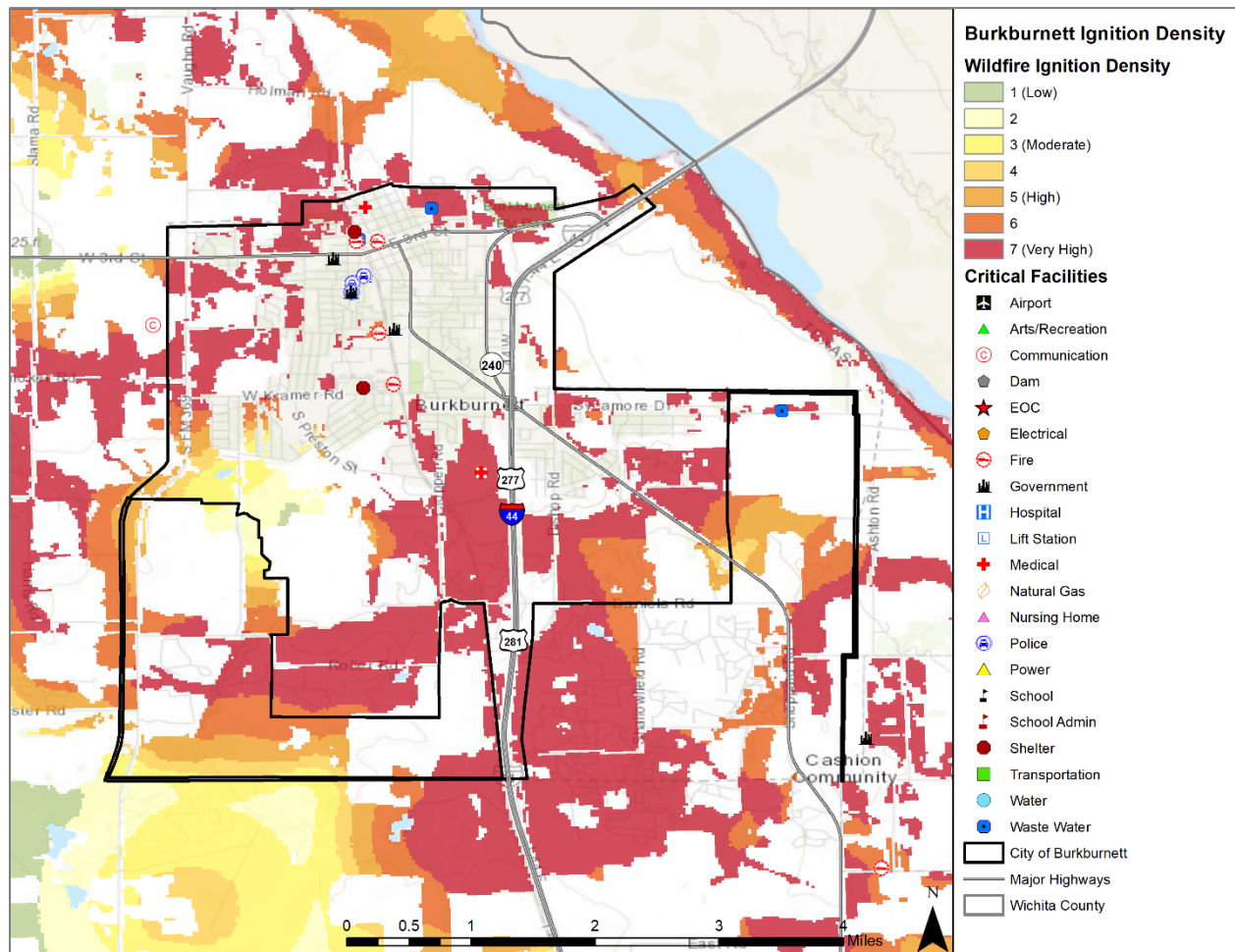
Figures 12-17 through 12-23 show the threat of wildfire to the Wichita County planning area.

Figure 12-17. Wildfire Ignition Density – Wichita County



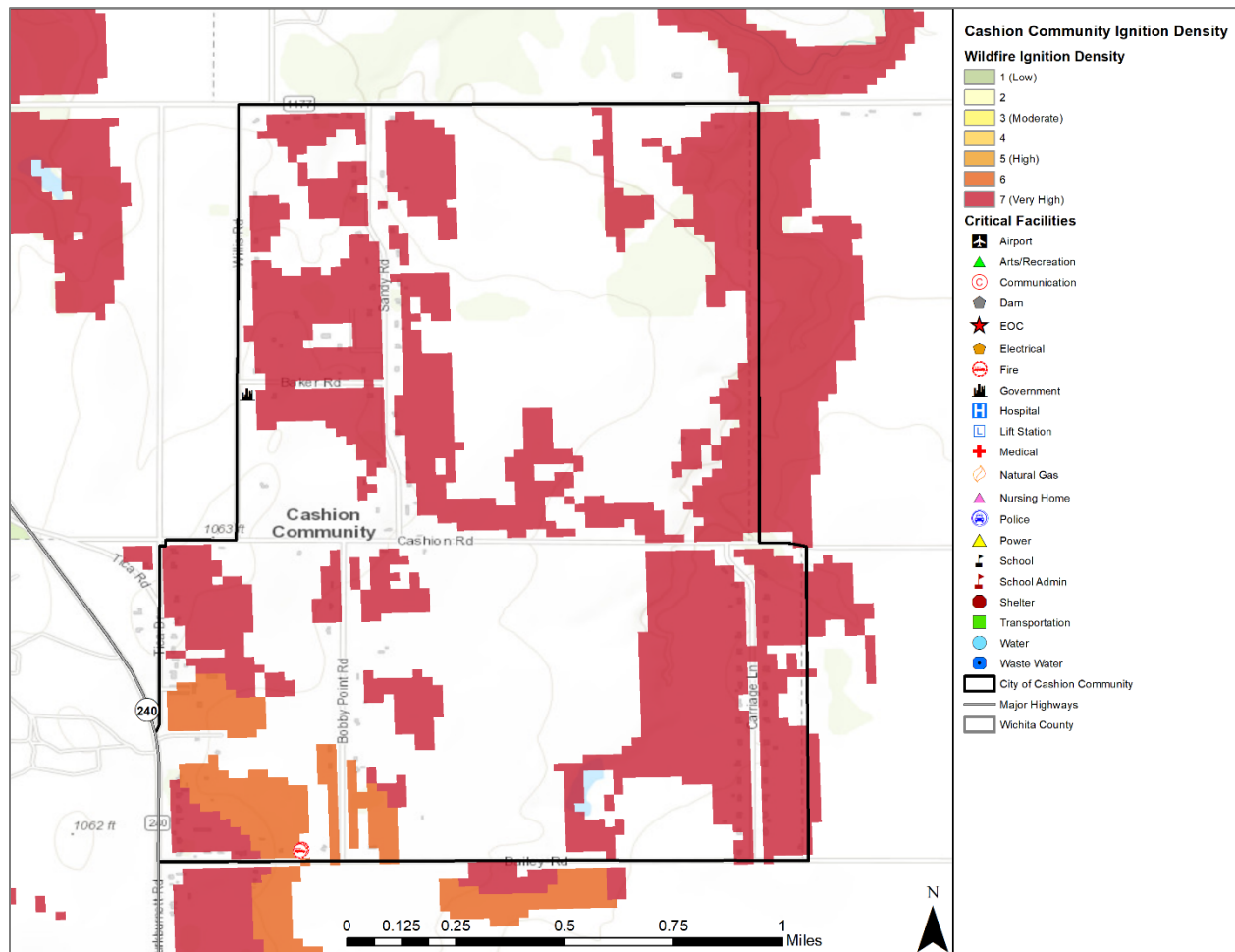
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Figure 12-18. Wildfire Ignition Density – City of Burkburnett



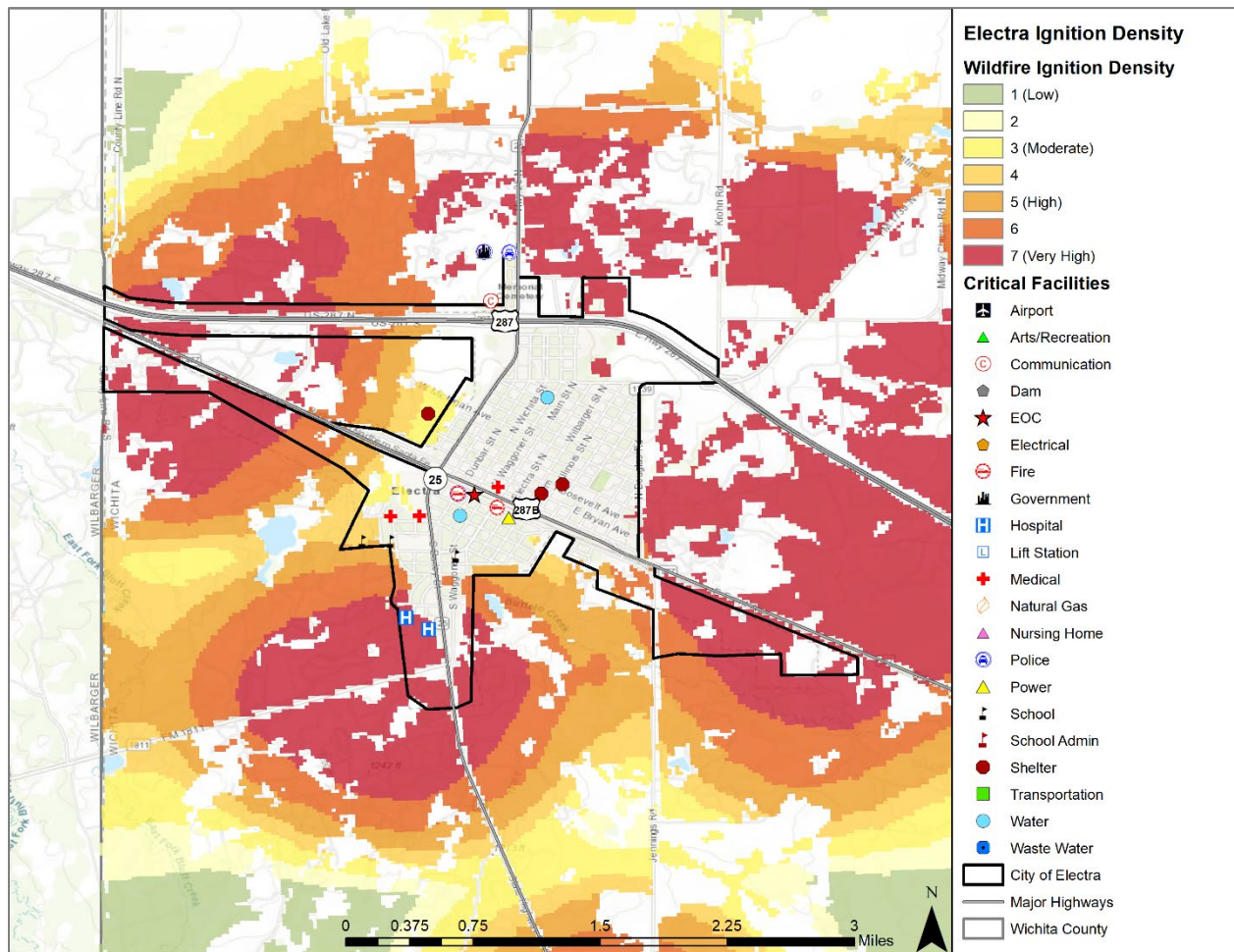
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Figure 12-19. Wildfire Ignition Density – City of Cashion Community



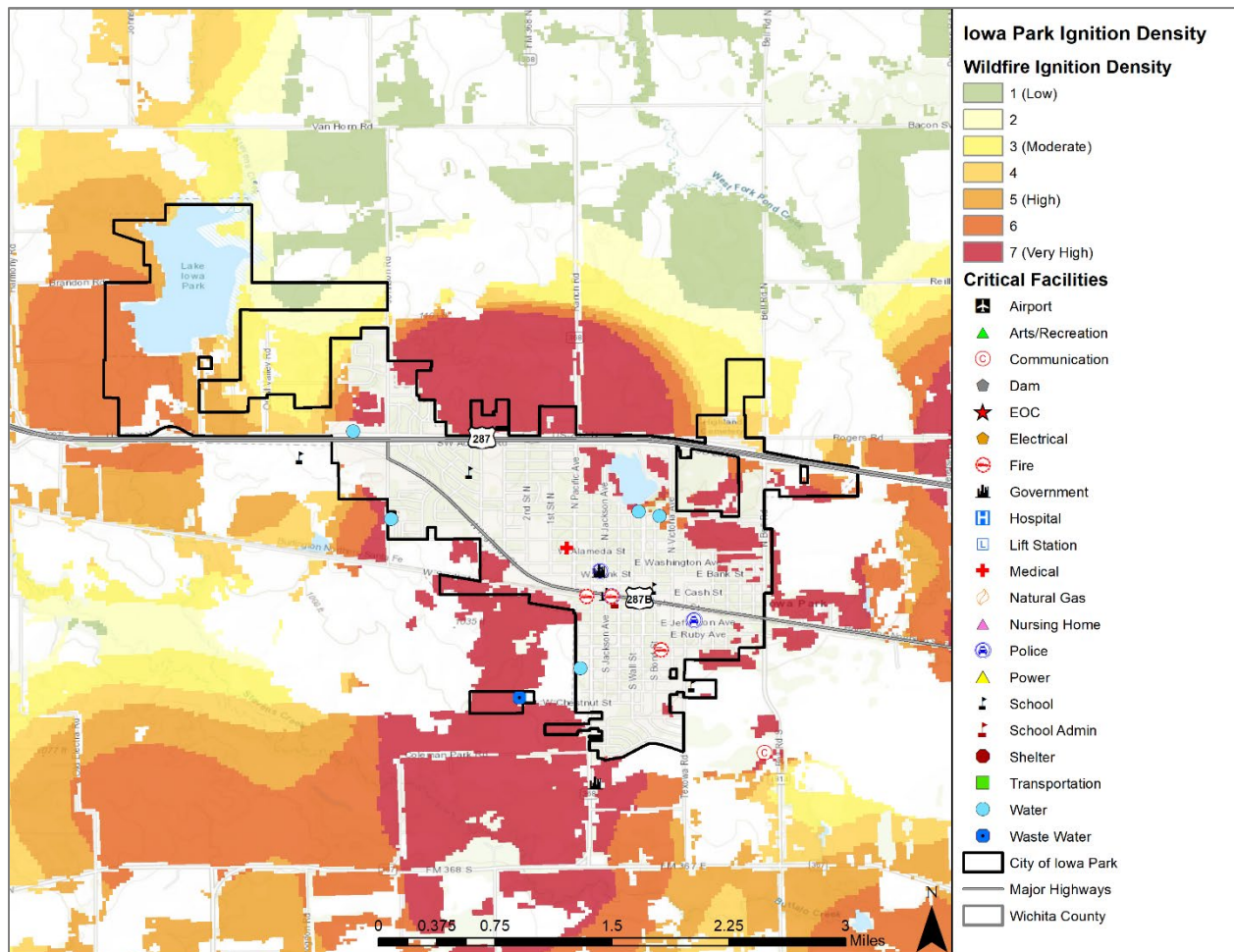
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Figure 12-20. Wildfire Ignition Density – City of Electra



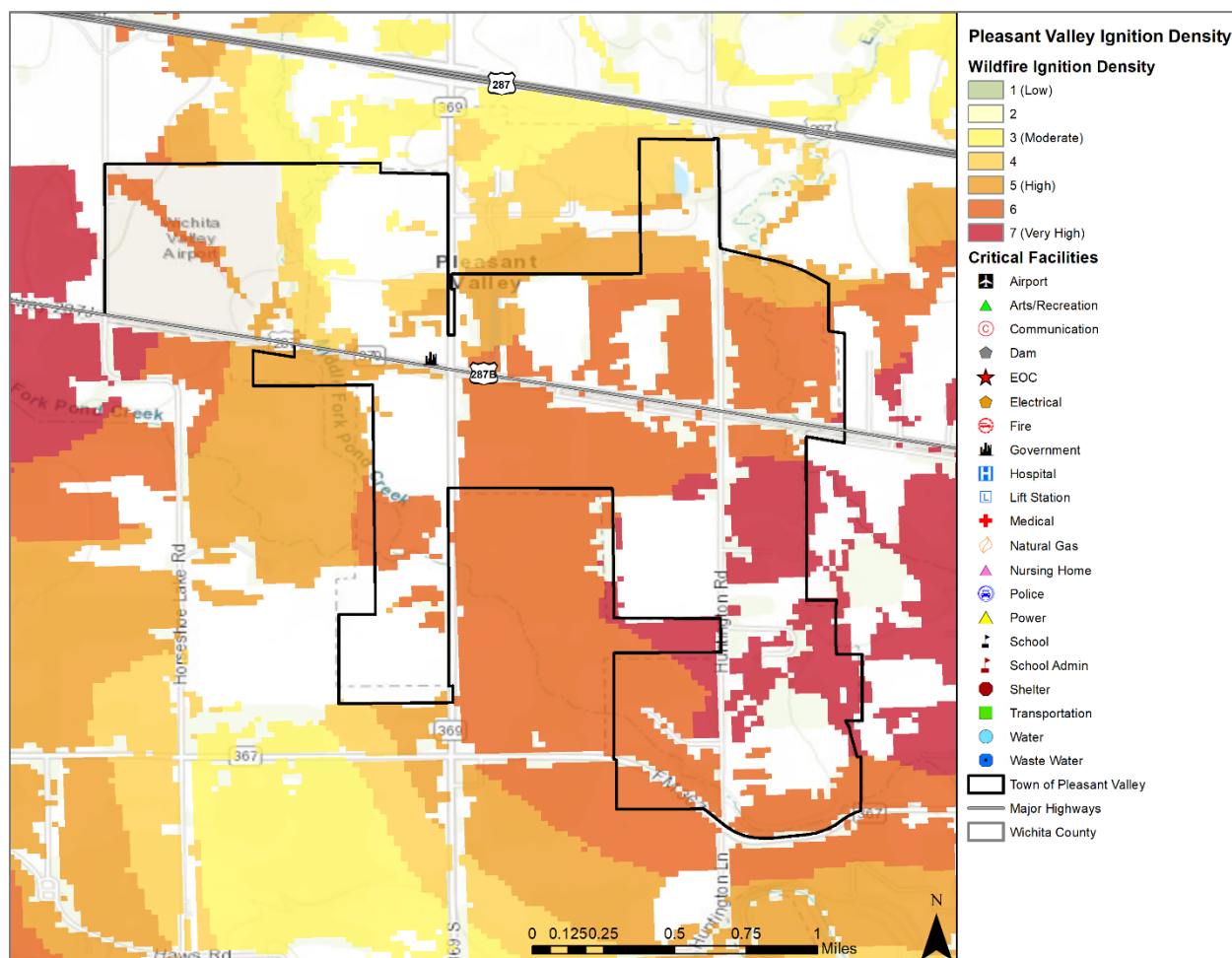
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Figure 12-21. Wildfire Ignition Density – City of Iowa Park



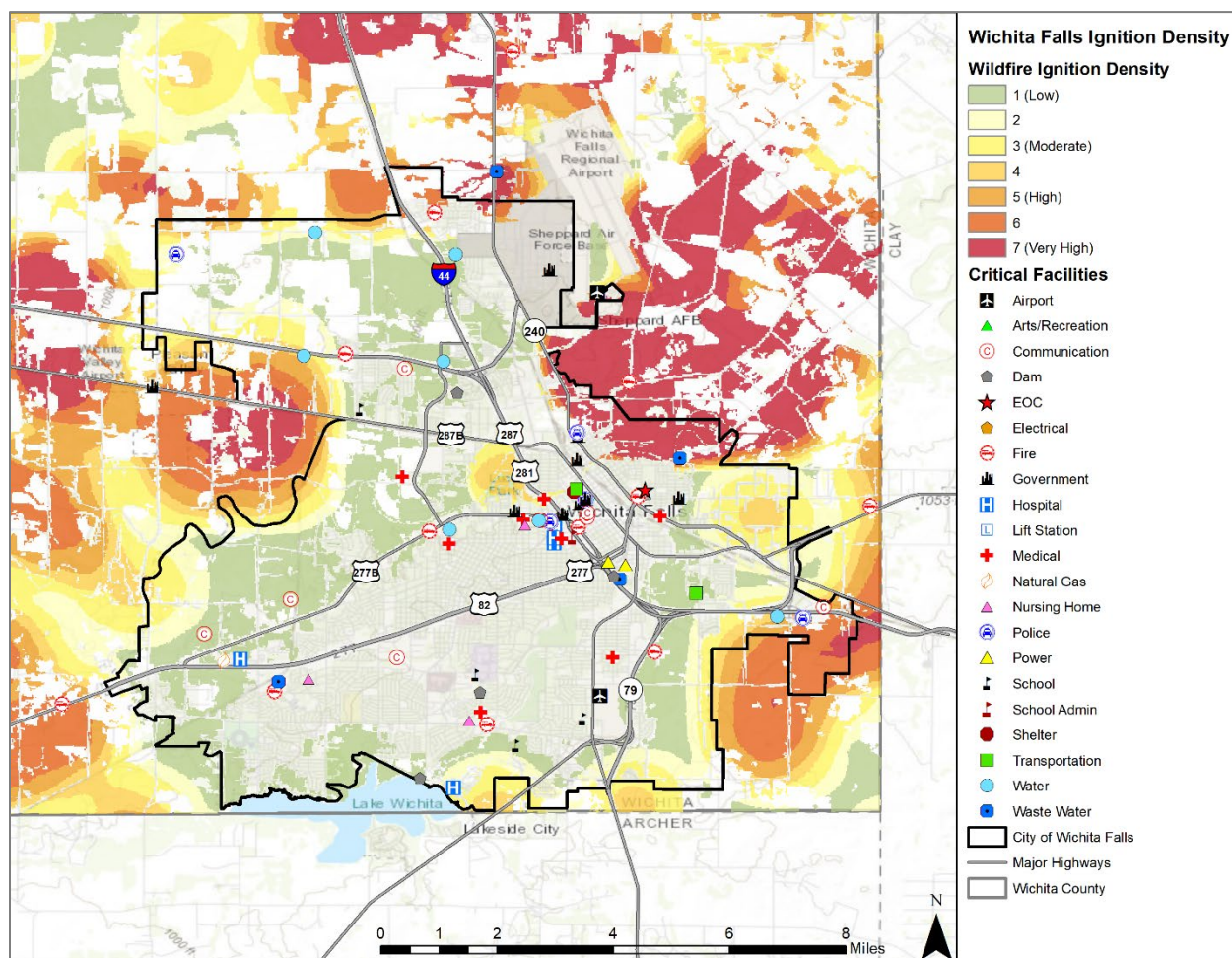
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Figure 12-22. Wildfire Ignition Density – City of Pleasant Valley



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Figure 12-23. Wildfire Ignition Density – City of Wichita Falls



Diminished air quality is an environmental impact that can result from a wildfire event and pose a potential health risk. The smoke plumes from wildfires can contain potentially inhalable carcinogenic matter. Fine particles of invisible soot and ash that are too small for the respiratory system to filter can cause immediate and possibly long-term health effects. The elderly or those individuals with compromised respiratory systems may be more vulnerable to the effects of diminished air quality after a wildfire event.

Climatic conditions such as severe freezes and drought can significantly increase the intensity of wildfires since these conditions kill vegetation, creating a prime fuel source for wildfires. The intensity and rate at which wildfires spread are directly related to wind speed, temperature, and relative humidity.

The severity of impact from major wildfire events can be substantial. Such events can cause multiple deaths, shut down facilities for 30 days or more, and cause more than 50 percent of affected properties to be destroyed or suffer major damage. Severity of impact is gauged by acreage burned, homes and structures lost, and the number of resulting injuries and fatalities.

For the Wichita County planning area, including all participating jurisdictions, the impact from a wildfire event can be considered "Limited," meaning injuries and/or illnesses are likely treatable with first aid, shutdown of facilities and services for 24-hours or less and less than 10 percent of

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property is destroyed or with major damage. Severity of impact is gauged by acreage burned, homes and structures lost, injuries and fatalities.

Table 12-7. Impact for Wichita County

JURISDICTION	IMPACT	DESCRIPTION
Wichita County	Limited	Wichita County has an estimated 46,874 people or 36.7% of the total population that live within the Wildland Urban Interface (WUI). Average housing density is most commonly 3 houses per 1 acre. County residents may suffer injuries treatable with first aid. Critical facilities could be shut down for less than 24-hours, and less than 10 percent of total property could be damaged.
City of Burkburnett	Limited	Within the City of Burkburnett, it is estimated 3,550 people or 34.7% of the total population that live within the Wildland Urban Interface (WUI). Average housing density is most commonly 3 houses per 1 acre. City residents may suffer injuries treatable with first aid. Critical facilities could be shut down for less than 24-hours, and less than 10 percent of total property could be damaged.
City of Cashion Community	Limited	Within the City of Cashion Community, it is estimated 136 people or 57.9% of the total population live within the Wildland Urban Interface (WUI). Average housing density is most commonly 1 house per 5 acres. City residents may suffer injuries treatable with first aid. Critical facilities could be shut down for less than 24-hours, and less than 10 percent of total property could be damaged.
City of Electra	Limited	Within the City of Electra, it is estimated 1,440 people or 52.5% of the total population live within the Wildland Urban Interface (WUI). Average housing density is most commonly 3 houses per 1 acre. City residents may suffer injuries treatable with first aid. Critical facilities could be shut down for 24-hours or less, and less than 10 percent of total property could be damaged.

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JURISDICTION	IMPACT	DESCRIPTION
City of Iowa Park	Limited	Within the City of Iowa Park, it is estimated 2,735 people or 43.3% of the total population live within the Wildland Urban Interface (WUI). Average housing density is most commonly 3 houses per 1 acre. City residents may suffer injuries treatable with first aid. Critical facilities could be shut down for 24-hours or less, and less than 10 percent of total property could be damaged.
City of Pleasant Valley	Limited	Within the City of Pleasant Valley, it is estimated 487 people or 88.4% of the total population live within the Wildland Urban Interface (WUI). Average housing density is most commonly 1 house per 5 acres. City residents may suffer injuries treatable with first aid. Critical facilities could be shut down for 24-hours, and less than 10 percent of total property could be damaged.
City of Wichita Falls	Limited	Within the City of Wichita Falls, it is estimated 33,243 people or 32.8% of the total population live within the Wildland Urban Interface (WUI). Average housing density is most commonly 3 houses per 1 acre. City residents may suffer injuries treatable with first aid. Critical facilities could be shut down for less than 24-hours, and less than 10 percent of total property could be damaged.

ASSESSMENT OF IMPACTS

A Wildfire event poses a potentially significant risk to public health and safety, particularly if the wildfire is initially unnoticed and spreads quickly. The impacts associated with a wildfire are not limited to the direct damages. Significant wildfire events can be frequently associated with a variety of impacts, including:

- The Wichita County planning area contains public parks and open space areas. Community assets including places like the River Bend Nature Center are vulnerable to the impacts of wildfire events. Recreation and tourism can be unappealing for years following a large wildfire, devastating directly related businesses.
- Recreation activities throughout the county and city's parks may be unavailable and tourism can be unappealing for years following a large wildfire event, devastating directly related local businesses and negatively impacting economic recovery.
- Persons in the area at the time of the fire are at risk for injury or death from burns and/or smoke inhalation.
- First responders are at greater risk of physical injury when in close proximity to the hazard while extinguishing flames, protecting property, or evacuating residents in the area.

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- First responders can experience heart disease, respiratory problems, and other long-term related illnesses from prolonged exposure to smoke, chemicals, and heat.
- Emergency services may be disrupted during a wildfire if facilities are impacted, roadways are inaccessible, or personnel are unable to report for duty.
- Critical county and city departments may not be able to function and provide necessary services depending on the location of the fire and the structures or personnel impacted.
- Non-critical businesses may be directly damaged, suffer loss of utility services, or be otherwise inaccessible, delaying normal operations and slowing the recovery process.
- Displaced residents may not be able to immediately return to work, further slowing economic recovery.
- Roadways in or near the WUI could be damaged or closed due to smoke and limited visibility.
- Older homes are generally exempt from modern building code requirements, which may require fire suppression equipment in the structure. 66.1 percent of homes in the planning area were built before 1980.
- Within Wichita County, 13 buildings and sites are on the National Register of Historic Places, many of which pre-date modern building codes.
- Vegetation in parks may be destroyed in a wildfire, impacting air quality and public health.
- Some high-density neighborhoods feature small lots with structures close together, increasing the potential for fire to spread rapidly.
- Air pollution from smoke may exacerbate respiratory problems of vulnerable residents.
- Charred ground after a wildfire cannot easily absorb rainwater, increasing the risk of flooding and potential mudflows.
- Wildlife may be displaced or destroyed.
- Historical or cultural resources may be damaged or destroyed.
- Tourism can be significantly disrupted, further delaying economic recovery for the area.
- Economic disruption negatively impacts the programs and services provided by the community due to short- and long-term loss in revenue.
- Fire suppression costs can be substantial, exhausting the financial resources of the community.
- Residential structures lost in a wildfire may not be rebuilt for years, reducing the tax base for the community.
- Direct impacts to municipal water supply may occur through contamination of ash and debris during the fire, destruction of aboveground delivery lines, and soil erosion or debris deposits into waterways after the fire.

The economic and financial impacts of a wildfire event on local government will depend on the scale of the event, what is damaged, costs of repair or replacement, lost business days in impacted areas, and how quickly repairs to critical components of the economy can be implemented. The level of preparedness and pre-event planning done by government, businesses, and citizens will contribute to the overall economic and financial conditions in the aftermath of a wildfire event.

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CLIMATE CHANGE CONSIDERATIONS

Wildfires require the alignment of a number of factors, including temperature, humidity, and the lack of moisture in fuels, such as trees, shrubs, grasses, and forest debris. All these factors have strong direct or indirect ties to climate variability and climate change. Research shows that changes in climate create warmer, drier conditions, leading to longer and more active fire seasons. Increases in temperatures and the thirst of the atmosphere due to human--caused climate change have increased aridity of forest fuels during the fire season.³

Vapor pressure deficit, an indicator of the ability of moisture to evaporate, is projected to increase as temperatures rise and carbon dioxide fertilization reduces transpiration, leading to both lower humidity and increased surface dryness. Overall, increased dryness should extend the wildfire season in places where the fire season is presently constrained by low levels of aridity, such as eastern Texas.⁴

Extreme heat and extended periods of drought contribute to wildfire risk in the planning area. Extreme temperatures and periods of drought destroy vegetation in the area, contributing to available fuels that spread wildfires. Additional climate change impacts from drought and extreme heat are discussed in Sections 5 and 6 of this plan. The projected increases in favorable wildfire conditions, including drought and extreme heat, indicate an increase in favorable wildfire conditions. Additional information and studies are needed to determine the degree and rate of any increased wildfire risk.

³ NOAA Wildfire Climate Connection, August 2022: wildfire-climate-connection.

⁴ Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, Texas A&M University Office of the Texas State Climatologist, 2021 update.



SECTION 13 WINTER STORM

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HAZARD DESCRIPTION



A severe winter storm event is identified as a storm with snow, ice, or freezing rain. This type of storm can cause significant problems for area residents. Winter storms are associated with freezing or frozen precipitation such as freezing rain, sleet, snow, and the combined effects of winter precipitation and strong winds. Wind chill is a function of temperature and wind. Low wind chill is a product of high winds and freezing temperatures.

Winter storms that threaten the Wichita County planning area, including participating jurisdictions, usually begin as powerful cold fronts that push south from central Canada. Although the entire planning area is at risk to ice hazards, extremely cold temperatures, and snow, the effects and frequencies of winter storm events are generally mild and short-lived.

As indicated in Figure 13-1, the Wichita County planning area, including all participating jurisdictions, is located in USDA Hardiness Zones 7 and 7b, with annual minimum temperatures between 0 degrees Fahrenheit (°F) and 10°F. During times of ice and snow accumulation, response times will increase until public works road crews are able to make major roads passable. Table 13-1 describes the types of winter weather possible to occur in the Wichita County planning area, including all participating jurisdictions.

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Figure 13-1. Annual Minimum Temperature¹

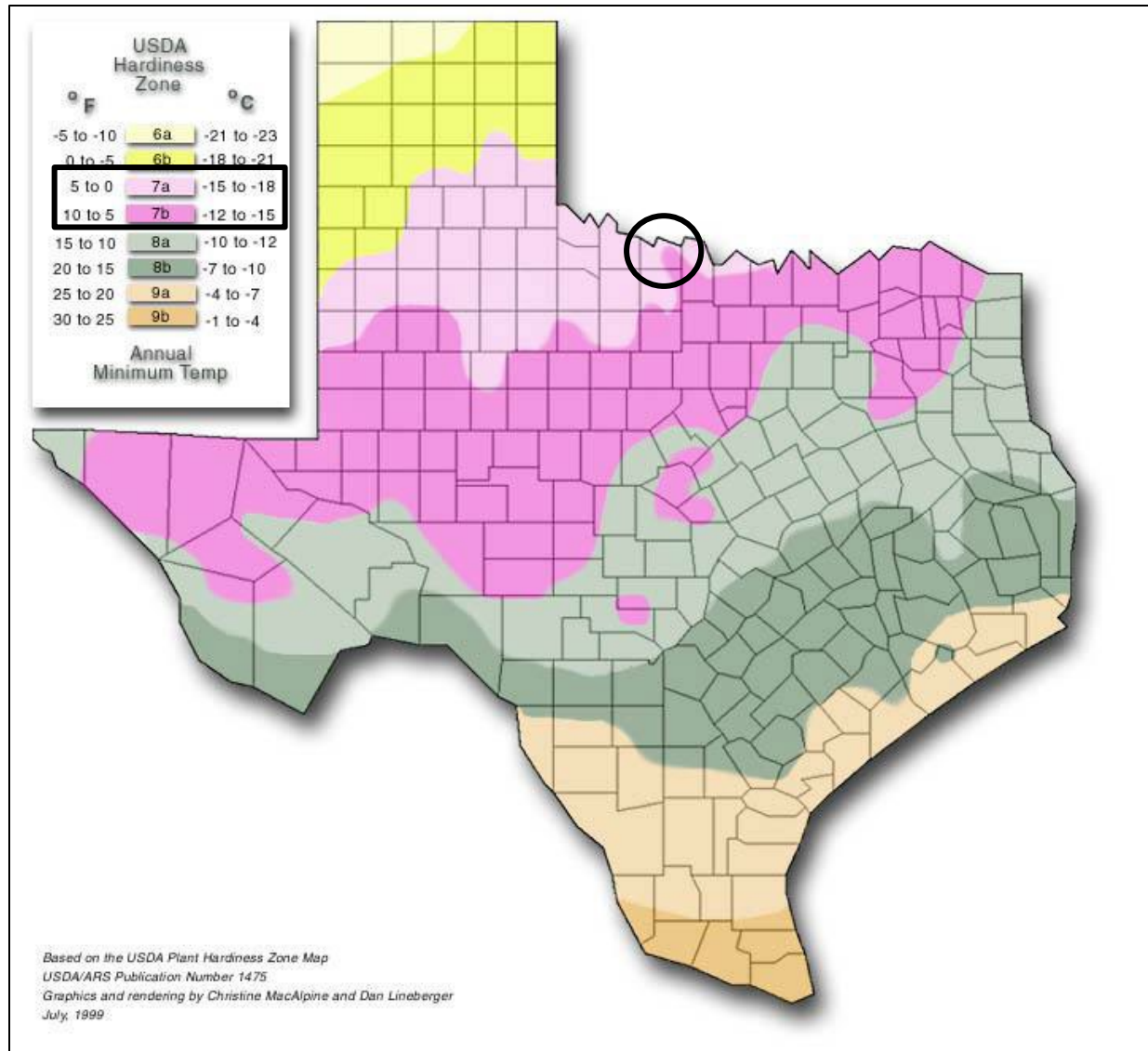


Table 13-1. Types of Winter Weather

TYPE OF WINTER WEATHER	DESCRIPTION
Freezing Rain or Freezing Drizzle	Rain or drizzle is likely to freeze upon impact, resulting in a coating of ice glaze on roads and all other exposed objects.
Sleet	Small particles of ice usually mixed with rain. If enough sleet accumulates on the ground, it makes travel hazardous.
Blizzard	Sustained wind speeds of at least 35 mph are accompanied by considerable falling or blowing snow. This alert is the most perilous winter storm with visibility dangerously restricted.

¹ USDA

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TYPE OF WINTER WEATHER	DESCRIPTION
Frost/Freeze	Below freezing temperatures are expected and may cause significant damage to plants, crops, and fruit trees.
Wind Chill	A strong wind combined with a temperature slightly below freezing can have the same chilling effect as a temperature nearly 50 degrees lower in a calm atmosphere. The combined cooling power of the wind and temperature on exposed flesh is called the wind-chill factor.

LOCATION

Winter storm events are not confined to specific geographic boundaries. Therefore, all existing and future buildings, facilities, and populations in the Wichita County planning area, including all participating jurisdictions, are considered to be exposed to a winter storm hazard and could potentially be impacted.

EXTENT

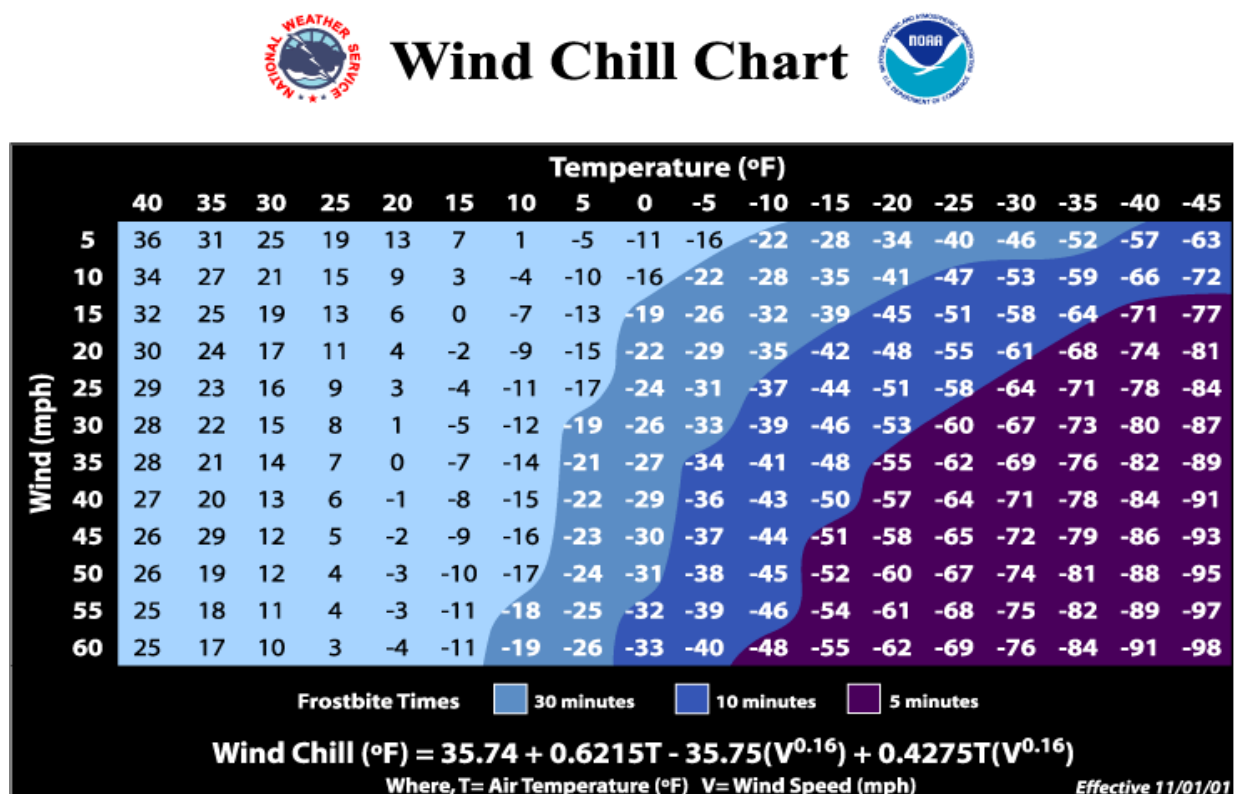
The extent or magnitude of a severe winter storm is measured in intensity based on the temperature and level of accumulations as shown in Table 13-2. Table 13-2 should be read in conjunction with the wind-chill factor described in Figure 13-2 to determine the intensity of a winter storm. The chart is not applicable when temperatures are over 50°F or winds are calm. This is an index developed by the National Weather Service.

Table 13-2. Magnitude of Severe Winter Storms

INTENSITY	TEMPERATURE RANGE (Fahrenheit)	EXTENT DESCRIPTION
Mild	40° – 50°	Winds less than 10 mph and freezing rain or light snow falling for short durations with little or no accumulations
Moderate	30° – 40°	Winds 10 – 15 mph and sleet and/or snow up to 4 inches
Significant	25° – 30°	Intense snow showers accompanied with strong gusty winds between 15 and 20 mph with significant accumulation
Extreme	20° – 25°	Wind driven snow that reduces visibility, heavy winds (between 20 to 30 mph), and sleet or ice up to 5 millimeters in diameter
Severe	Below 20°	Winds of 35 mph or more and snow and sleet greater than 4 inches

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Figure 13-2. Wind Chill Chart



Wind chill temperature is a measure of how cold the wind makes real air temperature feel to the human body. Since wind can dramatically accelerate heat loss from the body, a blustery 30°F day would feel just as cold as a calm day with 0°F temperatures. The Wichita County planning area has 37 previous occurrences recorded from January 1996 through June 2023. The planning area has been subject to blizzards, ice storms, sleet, and winter storms.

The average number of cold days is similar for the entire planning area. Therefore, the intensity or extent of a winter storm event to be mitigated for the area ranges from mild to moderate according to the definitions at Table 13-2. The Wichita County planning area can expect anywhere between 0.1 to 4.0 inches of ice and snow during a winter storm event, and temperatures between 0°F and 10°F with winds ranging from 0 to over 35 mph.

The National Weather Service Norman Weather Forecast Office issues a winter storm watch, advisory, or warning in advance of an event in order to give people enough time to prepare for an event. Wichita County could be under any of these warning types in advance of a winter storm event. Table 13-3 describes when each warning type would be issued.

Table 13-3. Winter Storm Watch, Advisory, Warning Descriptions

TYPE OF WINTER WEATHER	DESCRIPTION
Winter Weather Advisory	This alert may be issued for a variety of severe conditions. Weather advisories may be announced for snow, blowing or drifting snow, freezing drizzle, freezing rain, or a combination of weather events.

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TYPE OF WINTER WEATHER	DESCRIPTION
Winter Storm Watch	Severe winter weather conditions may affect your area (freezing rain, sleet, or heavy snow may occur separately or in combination).
Winter Storm Warning	Severe winter weather conditions are imminent.
Freezing Rain or Freezing Drizzle	Rain or drizzle is likely to freeze upon impact, resulting in a coating of ice glaze on roads and all other exposed objects.
Sleet	Small particles of ice usually mixed with rain. If enough sleet accumulates on the ground, it makes travel hazardous.
Blizzard	Sustained wind speeds of at least 35 mph are accompanied by considerable falling or blowing snow. This alert is the most perilous winter storm with visibility dangerously restricted.
Frost/Freeze	Below freezing temperatures are expected and may cause significant damage to plants, crops, and fruit trees.
Wind Chill	A strong wind combined with a temperature slightly below freezing can have the same chilling effect as a temperature nearly 50 degrees lower in a calm atmosphere. The combined cooling power of the wind and temperature on exposed flesh is called the wind-chill factor.

HISTORICAL OCCURRENCES

According to historical records and the best available data there have been 37 recorded winter storm events in Wichita County planning area. Historical winter storm information, as provided by the NCEI, identifies winter storm activity across a multi-county forecast area for each event. The appropriate percentage of the total property and crop damage reported for the entire forecast area has been allocated to each county impacted by the event, when appropriate. Historical winter storm data for the planning area is provided on a county-wide basis per the NCEI database. Table 13-4 shows historical incidents with reported damages for the planning area.

Table 13-4. Historical Winter Storm Events, 1996-2023²

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Wichita County	12/26/2000	0	0	\$44,255	\$0
Wichita County	1/12/2007	0	0	\$7,609	\$0
Wichita County	12/9/2007	0	0	\$7,332	\$0
Wichita County	1/3/2008	0	0	\$29,184	\$0
TOTALS		0	0	\$88,380	

² Values are in 2023 dollars. Database was search for events between January 1996 and June 2023. No events were reported for the Wichita County planning area in the database after February 23, 2022.

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Table 13-5. Historical Winter Storm Events Summary, 1996-2023

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY DAMAGES	CROP DAMAGES
Wichita County	37	0	0	\$88,380	\$0

Based on the list of historical winter storm events for the Wichita County planning area, 7 of the events have occurred since the 2018 Plan.

SIGNIFICANT EVENTS

February 13, 2021 – February 16, 2021 - Winter Storm Uri – Wichita County (DR-4586)

Winter Storm Uri was one of the most impactful winter events in the state's history. The winter storm event lasted a week and brought snow, sleet, and freezing rain statewide. Extreme and record breaking cold peaked across Oklahoma and Texas during the 14th-16th, with wind chills of -20 to as low as -30 degrees reported in much of the area. Air temperatures in the -10°F to -20 degrees range were also common on the 16th. Below zero wind-chills were recorded for an extended period, with the coldest readings recorded on the morning of the 15th, when wind chills of -15 to -25 degrees were measured.

Fatalities across the state were attributed to hypothermia, vehicle accidents, carbon monoxide poisoning, and chronic medical conditions complicated by a lack of electricity over several days. Statewide, more than 69 percent of households lost power at some point during the event, with average disruptions lasting 42 hours, 21 of which were consecutive. Water service was also disrupted for many of the communities in the planning area with 49 percent of households losing running water with an average disruption of 52 hours. The City of Wichita Falls Water Distribution was one of the few exceptions with no disruptions as a result of the event. The distribution facility was able to continue water flowing throughout the event, even during line breaks and chemical lines freezing. The disruption of service experienced was a result of individual homes freezing and not related to the loss of the water system.

The Wichita County planning area saw a record cold airmass entrenched over the area as yet another trough approached from the west. Snowfall covered most of Oklahoma, but the heaviest snow fell across southern Oklahoma and western North Texas where 6 to as much as 8 inches was reported. Reports from across Wichita County generally ranged from approximately 5 to 7 inches, with a maximum of 6.8 inches reported north of Sheppard Air Force Base.

December 24, 2009 – Wichita County / City of Wichita Falls

A major snow event impacted the City of Wichita Falls. Predictions for the snow fall were from 1 to 4 inches, however the event yielded reports in some areas of the city that had sustained up to 12 inches. Approximately one hundred cars were stranded for hours, some for 12+ hours. At the time, the city had no equipment or snowplows except for a few resources provided by TXDOT. Reports indicated that hotels were full, and shelters were open to residents. Rescue efforts continued for days after the snow event ended.

January 3, 2008 – Wichita County

Light precipitation developed over parts of northern Texas moving over surface temperatures in the upper 20s and lower 30s causing it to freeze. Ice accumulated on roadways causing numerous accidents as a result near the City of Wichita Falls. Monetary damages were estimated to be \$29,184 (2023 dollars).

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December 16, 2000 – Wichita County

A major winter storm developed across North Texas with significant accumulations of ice and snow with total ice and snow accumulations between two and four inches reported. Although damage to personal and public property and infrastructure was greater across portions of south central and southeast Oklahoma, approximately 25,000 residents lost power and schools were closed for one to two days. Hundreds of insurance claims were also received by local insurance companies for damage to property. Total damages reported for the planning area as a result of this event were approximately \$44,255 (2023 dollars).

PROBABILITY OF FUTURE EVENTS

With 37 events reported over a 27.5-year reporting period, the Wichita County planning area can anticipate approximately one to two winter storm events each year. The probability of a future winter storm event affecting the Wichita County planning area, including participating jurisdictions, is considered “Highly Likely”, with a winter storm likely to occur within the next year. The end of this section addresses climate change and its impacts on future winter storms in the planning area.

VULNERABILITY AND IMPACT

During periods of extreme cold and freezing temperatures, water pipes can freeze and crack, and ice can build up on power lines, causing them to break under the weight or causing tree limbs to fall on the lines. These events can disrupt electric service for long periods.

An economic impact may occur due to increased consumption of heating fuel, which can lead to energy shortages and higher prices. House fires and resulting deaths tend to occur more frequently from increased and improper use of alternate heating sources. Fires during winter storms also present a greater danger because water supplies may freeze and impede firefighting efforts.

The Wichita County Planning Team identified the following critical facilities (Table 13-6) as assets that are considered the most important to the planning area and are susceptible to a range of impacts caused by winter storm events. For a comprehensive list by participating jurisdiction see Appendix C.

Table 13-6. Critical Facilities Vulnerable to Winter Storm Events

CRITICAL FACILITIES	POTENTIAL IMPACTS
Emergency Response Departments (EOC, Fire, Police, EMS), Hospitals	<ul style="list-style-type: none">• Emergency operations, services and response times may be significantly impacted due to power outages, and/or loss of communications.• Exposure to extreme cold can cause illnesses in first responders if exposed for a period of time.• Roads may become impassable due to snow and/or ice impacting response times by emergency services.• Extended power outages due to increased usage may lead to possible looting, destruction of property, and theft, further burdening law enforcement resources.

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CRITICAL FACILITIES	POTENTIAL IMPACTS
Airport, Academic Institutions, Evacuation Centers & Shelters, Governmental Facilities	<ul style="list-style-type: none"> Power outages due to increased usage could disrupt critical care. Backup power sources could be damaged. Increased number of patients due to exposure to cold temperatures could lead to a strain on staff. Water pipes can freeze and burst leading to flooding within facilities. Facilities, infrastructure, or critical equipment including communications may be damaged, destroyed or otherwise inoperable. Essential supplies like medicines, water, food, and equipment deliveries may be delayed. Economic disruption due to power outages negatively impact airport services as well as area businesses reliant on airport operations. Exposure risks to outdoor workers.
Utility Services and Infrastructure (electric, water, wastewater, communications)	<ul style="list-style-type: none"> Emergency operations, services and response times may be significantly impacted due to power outages, and/or loss of communications. Roads may become impassable due to snow and/or ice impacting response times by emergency services. Power outages due to increased usage could disrupt critical care. Backup power sources could be damaged. Water pipes can freeze and burst leading to flooding within facilities.

People and animals are subject to health risks from extended exposure to cold air. Elderly people are at greater risk of death from hypothermia during these events, especially in the neighborhoods with older housing stock. According to the U.S. Center for Disease Control, every year hypothermia kills about 600 Americans, half of whom are 65 years of age or older. Another segment of the population at risk are those whose jobs consist of strenuous labor outdoors. In addition, populations living below the poverty level may not be able to afford to run heat on a regular basis or extend period of time.

The population over the age of 65 and under 5 in the Wichita County planning area is estimated at 20.9 percent of the total population, or an estimated total of 27,060³ potentially vulnerable residents in the planning area based on age. An estimated 16.6 percent of the planning area population live below the poverty level.

Older homes tend to be more vulnerable to the impacts of winter storm events. Over half of all housing units (66.1 percent) in the planning area were built before 1980 (Table 13-8).

Table 13-7. Populations at Greater Risk of Winter Storm Events

JURISDICTION	POPULATION 65 AND OLDER	POPULATION UNDER 5	POPULATION BELOW POVERTY LEVEL
Wichita County	18,932	8,128	21,484
City of Burburnett	2,190	716	1,063

³ US Census Bureau, American Community Survey Five-Year Estimates 2017-2021

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JURISDICTION	POPULATION 65 AND OLDER	POPULATION UNDER 5	POPULATION BELOW POVERTY LEVEL
City of Cashion Community	52	14	9
City of Electra	469	126	497
City of Iowa Park	1,184	779	524
City of Pleasant Valley	67	20	25
City of Wichita Falls	13,675	6,217	18,974

Table 13-8. Structures at Greater Risk of Winter Storm Events

JURISDICTION	SFR STRUCTURES BUILT BEFORE 1980
Wichita County	36,727
City of Burkburnett	3,445
City of Cashion Community	79
City of Electra	1,097
City of Iowa Park	1,857
City of Pleasant Valley	78
City of Wichita Falls	28,742

Historic loss for the Wichita County planning area, as reported to the NCEI database, is considered negligible (Table 13-9). The potential severity of impact for the planning area, including participating jurisdictions, is “Limited,” meaning injuries are treatable with first aid, shutdown of facilities and services for 24 hours or less, and less than 10 percent of property destroyed or with major damage.

Table 13-9. Winter Storm Event Damage Totals, 1996-2023

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Wichita County	\$88,380	\$3,214

ASSESSMENT OF IMPACTS

The greatest risk from a winter storm hazard is to public health and safety. The impact of climate change could produce longer, more intense winter storm events, exacerbating the current winter storm impacts. Worsening winter storm conditions can be frequently associated with a variety of impacts, including:

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- Vulnerable populations, particularly the elderly (14.6 percent of total population) and children under 5 (6.3 percent of total population), can face serious or life-threatening health problems from exposure to extreme cold including hypothermia and frostbite.
- Loss of electric power or other heat source can result in increased potential for fire injuries or hazardous gas inhalation because residents burn candles for light or use fires or generators to stay warm.
- Response personnel, including utility workers, public works personnel, debris removal staff, tow truck operators, and other first responders, are subject to injury or illness resulting from exposure to extreme cold temperatures.
- Response personnel would be required to travel in potentially hazardous conditions, elevating the life safety risk due to accidents and potential contact with downed power lines.
- Operations or service delivery may experience impacts from electricity blackouts due to winter storms.
- Power outages are possible throughout the planning area due to downed trees and power lines and/or rolling blackouts.
- Critical facilities without emergency backup power may not be operational during power outages.
- Emergency response and service operations may be impacted by limitations on access and mobility if roadways are closed, unsafe, or obstructed.
- Hazardous road conditions will likely lead to increases in automobile accidents, further straining emergency response capabilities.
- Depending on the severity and scale of damage caused by ice and snow events, damage to power transmission and distribution infrastructure can require days or weeks to repair.
- A winter storm event could lead to tree, shrub, and plant damage or death.
- Severe cold and ice could significantly damage vegetation in county parks.
- Older structures built to less stringent building codes may suffer greater damage as they are typically more vulnerable to impacts of winter storm events. 66.1 percent of homes in the county were built before 1980. Within Wichita County, 13 buildings and sites are on the National Register of Historic Places, many of which pre-date modern building codes.
- Schools may be forced to shut early due to treacherous driving conditions.
- Exposed water pipes may be damaged by severe or late season winter storms at both residential and commercial structures, causing significant damages.

The economic and financial impacts of winter weather on the community will depend on the scale of the event, what is damaged, and how quickly repairs to critical components of the economy can be implemented. The level of preparedness and pre-event planning done by businesses and citizens will also contribute to the overall economic and financial conditions in the aftermath of a winter storm event.

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CLIMATE CHANGE CONSIDERATIONS

Climate change is expected to reduce the number of extreme cold events statewide but increase in the variability of events.⁴ Extreme cold events will continue to be possible but overall winters are becoming milder, and the frequency of extreme winter weather events are decreasing due to the warming of the Arctic and less extreme cold air coming from that region.⁵ A trend that is expected to continue with winter extremes estimated to be milder by 2036 compared to extremes in the historic record.⁶

⁴ Fourth National Climate Assessment. Chapter 23 Southern Great Plains. U.S. Global Change Program. 2018.

⁵ Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, Texas A&M University Office of the Texas State Climatologist, 2021 update.

⁶ Assessment of Historic and Future Trends of Extreme Weather in Texas, 1900-2036, Texas A&M University Office of the Texas State Climatologist, 2021 update.



SECTION 14 DAM FAILURE

SECTION 14: DAM FAILURE

Portions of the Wichita County Hazard Mitigation Plan are considered confidential and not for release to the public. The information in this section is covered under Privacy Act of 1974 (5 U.S.C. Section 552a).



SECTION 15 EARTHQUAKE

SECTION 15: EARTHQUAKE

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HAZARD DESCRIPTION

An earthquake is the sudden movement of the Earth's surface cause by the release of stress accumulated within or along the edge of the Earth's tectonic plates, volcanic eruption, or by a manmade explosion. The majority of earthquakes occur along faults; however, earthquakes can occur within plate interiors. Over geologic time, plates move and plate boundaries change, pushing weakened boundary regions to the interior part of the plates. These areas of weakness within the continents can cause earthquakes in response to stresses that originate at the edges of the plate or in the deeper crust.

Earthquakes' locations are described by their focal depth and geographic position of the epicenter. The focal depth of an earthquake is the depth from the Earth's surface to the region where an earthquake's energy originates (the focus or hypocenter). The epicenter is the point on the Earth's surface directly above the hypocenter. Earthquakes usually occur without warning, with their effects impacting great distances away from the epicenter.

According to the U.S. Geological Society (USGS) Earthquake Hazards Program, an earthquake hazard is anything associated with an earthquake that may influence an individual's normal activities. Table 15-1 describes definition of examples.

Table 15-1. Definitions of Earthquake Hazards¹

HAZARD	DESCRIPTION
Surface Faulting	Displacement that reaches the earth's surface during slip along a fault. Commonly occurs with shallow earthquakes, those with an epicenter less than 20 kilometers.
Ground Motion (shaking)	The movement of the earth's surface from earthquakes or explosions. Ground motion or shaking is produced by waves that are generated by sudden slip on a fault or sudden pressure at the explosive source and travel through the earth and along its surface.
Landslide	A movement of surface material down a slope.

¹ Source: USGS, 2012

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HAZARD	DESCRIPTION
Liquefaction	A process by which water-saturated sediment temporarily loses strength and acts as a fluid, like when you wiggle your toes in the wet sand near the water at the beach. This effect can be caused by earthquake shaking.
Tectonic Deformation	A change in the original shape of a material due to stress and strain.
Tsunami	A sea wave of local or distant origin that results from large-scale seafloor displacements associated with large earthquakes, major submarine slides, or exploding volcanic islands.
Seiche	The sloshing of a closed body of water from earthquake shaking

LOCATION

Earthquake hazard areas are mapped by the US Geological Survey from lowest hazard to highest hazard areas. Figure 15-1 shows major earthquake hazard areas. An Earthquake Hazard Map, also known as a Percent Peak Ground Accelerations (%PGA) Map. The map shows the %PGA values with an 8 percent chance of being exceeded over 50 years. %PGA is an earthquake measurement that displays three things: the geographic area affected (all colored areas on the map), the probability of an earthquake of each given level of severity (2 percent chance in 50 years), and the strength of ground movement (severity) shown as percent of the acceleration force of gravity (%g) (the PGA is indicated by color). The Wichita County planning area including all participating jurisdictions, as identified in Figure 15-1, is located in a low hazard area of 0-8%g peak ground acceleration.

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Figure 15-1. U.S. Map of Peak Ground Acceleration

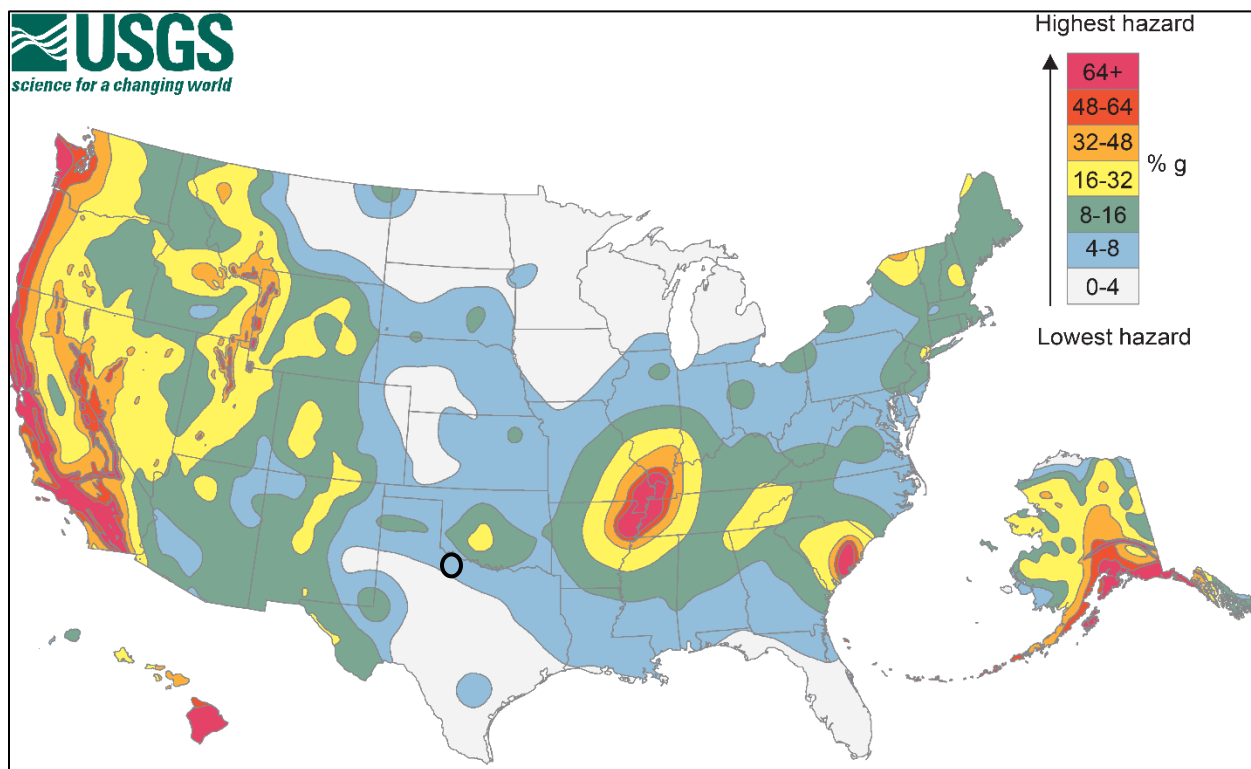
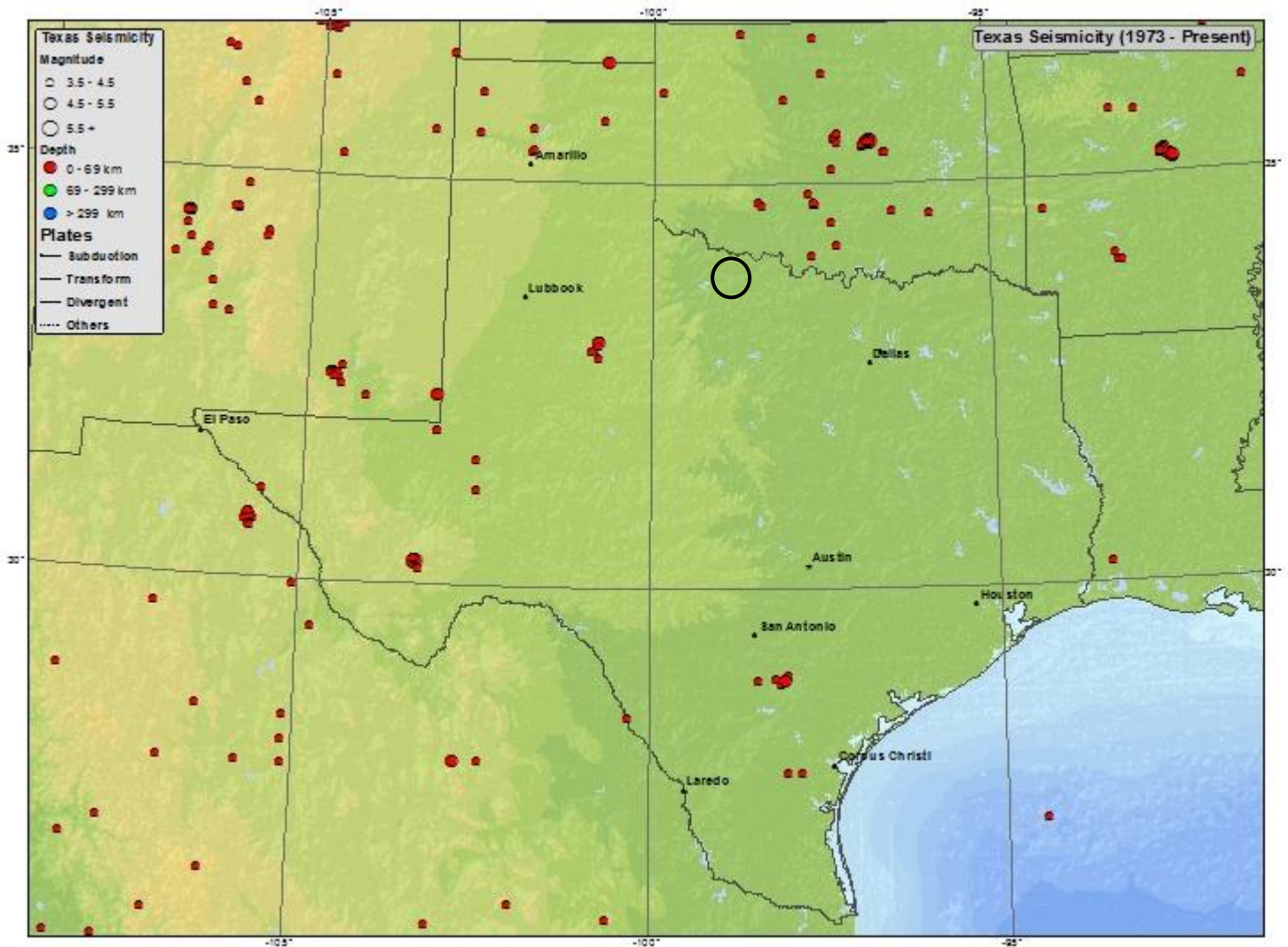


Figure 15-2 maps historic earthquake epicenters across Texas between 1973 and 2012.

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Figure 15-2. Historic Earthquake Epicenters in Texas, 1973-2012



EXTENT

The magnitude, or intensity of an earthquake, is a recorded value of the amplitude of seismic waves. The Richter scale is the most commonly used scale that measures the magnitude of earthquakes. It has no upper limit and is not used to describe damage (Table 15-2).

Table 15-2. Richter Scale

RICHTER MAGNITUDES	EARTHQUAKE EFFECTS
2.5 or LESS	Usually not felt, but can be recorded by seismograph
2.5-5.4	Often felt, but only causes minor damage
5.5-6.0	Slight damage to buildings and other structures

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RICHTER MAGNITUDES	EARTHQUAKE EFFECTS
6.1 TO 6.9	May cause a lot of damage in very populated areas
7.0 TO 7.9	Major earthquake; serious damage
8 OR GREATER	Great earthquake; can totally destroy communities near the epicenter

The intensity of an earthquake is expressed by the Modified Mercalli Scale, based on the effects of ground shaking on people, buildings, and natural features, and is location dependent. The Modified Mercalli Scale gives the intensity of the earthquake in values ranging from I to XII. Table 15-3 summarizes earthquake intensity as described by the Modified Mercalli Scale and provides a comparison between the Richter and Modified Mercalli Intensity Scales.

Table 15-3. Modified Mercalli Intensity (MMI) Scale

SCALE	INTENSITY	DESCRIPTION OF EFFECTS	CORRESPONDING RICHTER MAGNITUDE
I	INSTRUMENTAL	Not Felt except by a very few under especially favorable conditions	
II	FEEBLE	Felt only by a few persons at rest, especially on upper floors of buildings	< 4.2
III	SLIGHT	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration Estimated	
IV	MODERATE	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors, disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.	
V	SLIGHTLY STRONG	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.	< 4.8
VI	STRONG	Felt by all, many frightened. Some heavy furniture moved; a few	< 5.4

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SCALE	INTENSITY	DESCRIPTION OF EFFECTS	CORRESPONDING RICHTER MAGNITUDE
		instances of fallen plaster. Damage slight.	
VII	VERY STRONG	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken	< 6.1
VIII	DESTRUCTIVE	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned	
IX	RUINOUS	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.	< 6.9
X	DISASTROUS	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.	< 7.3
XI	VERY DISASTROUS	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.	< 8.1
XII	CATASTROPHIC	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.	> 8.1

Table 15-4 lists the Modified Mercalli Intensity (MMI) with the corresponding Acceleration (%g) (PGA), as well as the perceived shaking and potential damage expected.

Table 15-4. Modified Mercalli Intensity (MMI) and PGA Equivalents

MMI	ACCELERATION (%g) (PGA)	PERCEIVED SHAKING	POTENTIAL DAMAGE
I	<.17	Not Felt	None

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MMI	ACCELERATION (%g) (PGA)	PERCEIVED SHAKING	POTENTIAL DAMAGE
II	.17-1.4	Weak	None
III	.17-1.4	Weak	None
IV	1.4-3.9	Light	None
V	3.9-9.2	Moderate	Very Light
VI	9.2-18	Strong	Light
VII	18-34	Very Strong	Moderate

Taking into consideration the possible extent of an earthquake for the area, by reviewing Tables 15-2 through 15-4 in conjunction with previous occurrences as depicted in Figure 15-2, Wichita County planning area, including all participating jurisdictions, experience on average less than 2.5 Richter Scale or Level IV or instrumental impact based on the Modified Mercalli intensity scale. This is the greatest extent the entire planning area can anticipate in the future.

HISTORICAL OCCURRENCES

According to USGS, and the National Geophysical Data Center (NGDC), there are no “significant” earthquakes on record for the state of Texas and the entire Wichita County planning area from 2150 B.C. to present. A significant earthquake, as defined by NGDC, is one that has caused at least moderate damage (approximately \$1 million or more), has resulted in ten or more deaths, has registered as a magnitude 7.5 or greater, has registered as Modified Mercalli Intensity (MMI) Scale X or greater, or generated a tsunami. None of these criteria have been met by any seismic activity known to have impacted the Wichita County planning area, including all participating jurisdictions.

PROBABILITY OF FUTURE EVENTS

Earthquake Hazard Maps show the distribution of earthquake shaking levels that have a certain probability of occurring over a given period. The USGS database shows that there is a 0.34% chance of a major earthquake within 50km of Wichita County, TX within the next 50 years. Based on historical records, the probability of an earthquake affecting the Wichita County planning area, including all participating jurisdictions is unlikely, meaning that an event is possible in the next ten years.

VULNERABILITY AND IMPACT

Little warning is usually associated with earthquakes and can impact areas a great distance away from the epicenter. The amount of damage depends on the density of population and buildings, and infrastructure construction in the affected area. Some places may be more vulnerable than others based on soil type, building age, and building codes in the Wichita County planning area, including and all participating jurisdictions.

The Wichita County Planning Team identified the following critical facilities as assets that are considered the most important to the planning area and are susceptible to a range of impacts

SECTION 15: EARTHQUAKE

caused by earthquake events (Table 15-5). The critical infrastructure with the greatest vulnerability to earthquakes are power and communication facilities. Failure of these facilities can result in a loss of service and cascading impacts. For a comprehensive list by participating jurisdiction see Appendix C.

Table 15-5. Critical Facilities Vulnerable to Earthquake Event

CRITICAL FACILITIES	POTENTIAL IMPACTS
Emergency Response Services (EOC, Fire, Police, EMS), Hospitals	<ul style="list-style-type: none"> Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. Emergency vehicles can be impacted or damaged. Power outages could disrupt communications, delaying emergency response times. Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities. Damaged roads and highway infrastructure can impede emergency response vehicle access to areas. Increased number of structure fires due to gas line ruptures and downed power lines, further straining the capacity and resources of emergency personnel. First responders are exposed to unstable and unusual debris, hazardous materials, and generally unsafe conditions. Extended power outages and evacuations may lead to possible looting, destruction of property, and theft, further burdening law enforcement resources.
Airport, Academic Institutions, Evacuation Centers & Shelters, Governmental Facilities	<ul style="list-style-type: none"> Structures can be damaged by debris from damaged infrastructure, or other damaged structures, and falling trees damaged by an earthquake. Power outages could disrupt critical care. Backup power sources could be damaged. Evacuations may be necessary due to extended power outages, fires, or other associated damage to facilities. Power outages and infrastructure damage may prevent larger airports from acting as temporary command centers for logistics, communications, and emergency operations. Temporary break in operations may significantly inhibit post event evacuations. Damaged or destroyed highway infrastructure may substantially increase the need for airport operations.
Utility Services and Infrastructure (electric, water, wastewater, communications)	<ul style="list-style-type: none"> Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications. Emergency vehicles can be impacted or damaged. Power outages could disrupt communications, delaying emergency response times.

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CRITICAL FACILITIES	POTENTIAL IMPACTS
	<ul style="list-style-type: none">• Critical staff may be injured or otherwise unable to report for duty, limiting response capabilities.• Damaged roads and highway infrastructure can impede emergency response vehicle access to areas.• Increased number of structure fires due to gas line ruptures and downed power lines, further straining the capacity and resources of emergency personnel.• First responders are exposed to unstable and unusual debris, hazardous materials, and generally unsafe conditions.• Extended power outages and evacuations may lead to possible looting, destruction of property, and theft, further burdening law enforcement resources.

With no historical events recorded, annualized loss-estimates for earthquakes are not available; neither is a breakdown of potential dollar losses of critical facilities and infrastructure. The potential severity of impact from an earthquake for the entire Wichita County planning area, including all participating jurisdictions is classified as “Limited”, meaning that less than 10 percent of infrastructure would be damaged with critical facilities being shut down for less than 24 hours.

CLIMATE CHANGE CONSIDERATIONS

According to the USGS, statistically there is approximately an equal distribution of earthquakes in all cold weather, hot weather, rainy weather, etc. Very large low-pressure changes associated with major storm systems, like typhoons and hurricanes, are known to trigger episodes of fault slip or slow earthquakes in the Earth’s crust and may also play a role in triggering some damaging earthquakes. However, the numbers are small and are not statistically significant.²

Damaging earthquakes are rare in Texas. However, it is important to be selective about mitigation efforts, focusing attention on structures or areas where potential hazard is greatest. The Wichita County planning area has a very low risk for future damaging earthquakes. Climate change is not considered to have a significant impact on frequency or severity of potential earthquakes in the planning area at this time.

² (n.d.). *Natural Hazards*. United States Geological Survey. <https://www.usgs.gov/faqs/there-earthquake-weather>



SECTION 16 MITIGATION STRATEGY

SECTION 16: MITIGATION STRATEGY

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Goal 4.....	2
Goal 5.....	2
Goal 6.....	2

MITIGATION GOALS

Based on the results of the risk and capability assessments, the Planning Team developed and prioritized the mitigation strategy. This involved utilizing the results of both assessments and reviewing the goals and objectives that were included in the previous 2018 Plan. At the Mitigation Workshop in June 2023, Planning Team members reviewed the mitigation strategy from the previous 2018 Plan. The consensus among all members present was that the strategy developed for the 2018 Plan did not require changes, as it identified overall improvements to be sought in the Plan Update. However, the order and priority of the goals and objectives were reorganized.

GOAL 1

Protect public health and safety.

OBJECTIVE 1.1

Advise the public about health and safety precautions to guard against injury and loss of life from hazards.

OBJECTIVE 1.2

Maximize utilization of the latest technology to provide adequate warning, communication, and mitigation of hazard events.

OBJECTIVE 1.3

Reduce the danger to, and enhance protection of, high risk areas during hazard events.

OBJECTIVE 1.4

Protect critical facilities and services.

GOAL 2

Build and support local capacity and commitment to continuously become less vulnerable to hazards.

OBJECTIVE 2.1

Build and support local partnerships to continuously become less vulnerable to hazards.

OBJECTIVE 2.2

Build a cadre of committed volunteers to safeguard the community before, during, and after a disaster.

OBJECTIVE 2.3

Build hazard mitigation concerns into county and city planning and budgeting processes.

SECTION 16: MITIGATION STRATEGY

GOAL 3

Increase public understanding, support, and demand for hazard mitigation.

OBJECTIVE 3.1

Heighten public awareness regarding the full range of natural and man-made hazards the public may face.

OBJECTIVE 3.2

Educate the public on actions they can take to prevent or reduce the loss of life or property from all hazards and increase individual efforts to respond to potential hazards.

OBJECTIVE 3.3

Publicize and encourage the adoption of appropriate hazard mitigation measures.

GOAL 4

Protect new and existing properties.

OBJECTIVE 4.1

Reduce repetitive losses to the National Flood Insurance Program (NFIP).

OBJECTIVE 4.2

Use the most cost-effective approach to protect existing buildings and public infrastructure from hazards.

OBJECTIVE 4.3

Enact and enforce regulatory measures to ensure that future development will not put people in harm's way or increase threats to existing properties.

GOAL 5

Maximize the resources for investment in hazard mitigation.

OBJECTIVE 5.1

Maximize the use of outside sources of funding.

OBJECTIVE 5.2

Maximize participation of property owners in protecting their properties.

OBJECTIVE 5.3

Maximize insurance coverage to provide financial protection against hazard events.

OBJECTIVE 5.4

Prioritize mitigation projects, based on cost-effectiveness and sites facing the greatest threat to life, health, and property.

GOAL 6

Promote growth in a sustainable manner.

OBJECTIVE 6.1

Incorporate hazard mitigation activities into long-range planning and development activities.



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OBJECTIVE 6.2

Promote beneficial uses of hazardous areas while expanding open space and recreational opportunities.

OBJECTIVE 6.3

Utilize regulatory approaches to prevent the creation of future hazards to life and property.



SECTION 17 PREVIOUS ACTIONS

SECTION 17: PREVIOUS ACTIONS

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SUMMARY

Planning Team members were given copies of the previous mitigation actions submitted in the 2018 Wichita County Plan and the 2020 City of Wichita Falls Plan at the mitigation workshop. Wichita County and all participating jurisdictions reviewed the previous actions and provided an analysis as to whether the action had been completed, should be deferred as an ongoing activity, or be deleted from the Plan Update. The actions from the 2018 and 2020 Plans are included in this section as they were written previously, with the exception of the “2024 Analysis” section.

SECTION 17: PREVIOUS ACTIONS

WICHITA COUNTY & CITIES OF BURKBURNETT, CASHION COMMUNITY, ELECTRA, IOWA PARK AND PLEASANT VALLEY

Wichita County & Participating Jurisdictions – Action #1	
Proposed Action:	Hydrologic and Hydraulic (H&H) Analyses of Earthen Dams
BACKGROUND INFORMATION	
Jurisdiction/Location:	Wichita County, City of Iowa Park, City of Burkburnett, City of Cashion, City of Electra, City of Pleasant Valley
Project Description:	Contract with professional engineering firm to perform H&H Analyses of earthen dams at North Fork Buffalo Creek Reservoir and Lake Gordon. Based on available funding and results of such analyses, future mitigation action can be planned. Due to a data deficiency in the dam inundation areas, the extent that is unknown, and a lack of impact and vulnerability statements for dams, an analysis of the dams was deemed an action for dam failure because of the deficiency that exists.
Benefit:	Prevent loss of life and injury and improve information to the public
Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam, Flood
Estimated Cost:	\$25,000
Potential Funding Sources:	City of Iowa Park Public Works Improvement Fund
Lead Agency/Department Responsible:	City of Iowa Park Public Works Improvement Fund
Implementation Schedule:	24 months depending on available funding.

2024 ANALYSIS:	
Wichita County	Delete Action. Wichita County is not responsible for any dams.
City of Burkburnett	Delete Action. No dams located within City limits.
City of Cashion Community	Delete Action. No dams located within City limits.
City of Electra	Defer to Plan Update.
City of Iowa Park	Completed and Defer to Plan Update. The North Fork Buffalo Creek Reservoir Dam, the Lake Iowa Park Dam, and the Gordon Lake Dam were analyzed, and EOPs developed. Ongoing analysis and maintenance are in order.
City of Pleasant Valley	Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

Wichita County & Participating Jurisdictions – Action #2	
Proposed Action:	Launch a Turn Around Don't Drown Campaign
BACKGROUND INFORMATION	
Jurisdiction/Location:	Wichita County, City of Iowa Park, City of Burkburnett, City of Cashion, City of Electra, City of Pleasant Valley
Project Description:	<p>The National Weather Service (NWS) has introduced a national flood safety initiative "Turn Around Don't Drown" (TADD). The TADD initiative is a solution to minimize the loss of lives each year when motorists drive into flood waters. The simple solution is to stay out of flooded roadways. The NWS program is geared to inform the public of these dangers. Communities have the opportunity to participate in a number of ways:</p> <ul style="list-style-type: none"> • Post TADD information and icons on community web pages • Place TADD bumper stickers on all community vehicles • Construct TADD barricades that can be placed at selected low water crossings during flooding conditions • Initiate public education efforts
Benefit:	Prevent loss of life and injury and improve information to the public
Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam, Flood
Estimated Cost:	Staff Time, Warning signs \$150.00 each installation, Barricades, \$250.00 each
Potential Funding Sources:	Staff Time
Lead Agency/Department Responsible:	Wichita County Office of Emergency Management
Implementation Schedule:	180 months

2024 ANALYSIS:	
Wichita County	Completed. Flyers and information published and made available at Community Events.
City of Burkburnett	Completed. Information is available through County Emergency Management
City of Cashion Community	Defer to Plan Update.
City of Electra	Defer to Plan Update.
City of Iowa Park	Completed and Defer to Plan Update. Pre-positioned barricades and permanent signage were installed on three streets. Ongoing analysis and maintenance are in order.
City of Pleasant Valley	Defer to Plan Update.

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Wichita County & Participating Jurisdictions – Action #3	
Proposed Action:	Planning, Design and Construction of Water Resources Projects, Encourage Water Conservation and Conduct Public Education
BACKGROUND INFORMATION	
Jurisdiction/Location:	Wichita County, City of Iowa Park, City of Burkburnett, City of Cashion, City of Electra, City of Pleasant Valley
Project Description:	Support planning, design, and construction of water resources projects and increase public awareness to implement water conservation initiatives, describe the evaporation problem, increase water supply, and improve water storage and distribution systems. Support the Red River Authority planning efforts to obtain federal and state funding to develop water resources for the Wichita County area. Plan Section 2.4 describes proposed water projects to meet the area needs on the 50-year planning horizon.
Benefit:	The 2015/2016 Texas Almanac estimates Wichita County property values at \$4.8B; annual wages at \$362M; and annual retail sales at \$1.2B (B:C = 34 if total loss)
Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)	Education and Awareness
MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Estimated Cost:	\$155 million
Potential Funding Sources:	Environmental Protection Agency, Texas Water Development Board, Red River Authority, Texas State Soil Water Conservation Board
Lead Agency/Department Responsible:	Wichita County OEM
Implementation Schedule:	120 months
2024 ANALYSIS:	
Wichita County	Defer to Plan Update. Public education is ongoing; however, funds have not been made available to implement water resource projects.
City of Burkburnett	Defer to Plan Update. Public education is ongoing; however, funds have not been made available to implement water resource projects.
City of Cashion Community	Defer to Plan Update.
City of Electra	Defer to Plan Update.
City of Iowa Park	Defer to Plan Update. The Drought Contingency Plan was updated, and Stage One Drought Watch Restriction Notice mailed to 3,000 utility customers and public noticed posted on city website and social media. Ongoing analysis and public notices are in order.
City of Pleasant Valley	Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

Wichita County & Participating Jurisdictions – Action #4	
Proposed Action:	Chlorine Control Project in the Red River Basin
BACKGROUND INFORMATION	
Jurisdiction/Location:	Wichita County, City of Iowa Park, City of Burkburnett, City of Cashion, City of Electra, City of Pleasant Valley
Project Description:	Chloride Concentrations in Lake Kemp and Lake Diversion range from 696 mg/l to 1,985 mg/l with concentration greater than 1,312 mg/l a total of 50 % of the time. Maximum chloride concentrations for drinking water are 250 mg/l, chloride levels usually average 20-60 mg/l. The proposed project is described in Plan Section 2.4. Treat water from Lake Kemp/Diversion Reservoirs by improving water quality in Pease and Wichita Rivers before they reach the Red River.
Benefit:	The 2015/2016 Texas Almanac estimates Wichita County property values at \$4.8B; annual wages at \$362M; and annual retail sales at \$1.2B (B:C = 21 with D1 + D2)
Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Estimated Cost:	\$77.5 million, Estimated Annual Cost \$6,587,000
Potential Funding Sources:	COE Tulsa District, Red River Authority, Texas State Soil and Water Conservation Board
Lead Agency/Department Responsible:	Wichita Falls/Wichita County Public Health District
Implementation Schedule:	108 months

2024 ANALYSIS:	
Wichita County	Defer to Plan Update. Funding not available.
City of Burkburnett	Defer to Plan Update. Funding not available
City of Cashion Community	Defer to Plan Update.
City of Electra	Defer to Plan Update.
City of Iowa Park	Delete Action. City no longer wishes to implement.
City of Pleasant Valley	Defer to Plan Update.

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Wichita County & Participating Jurisdictions – Action #5	
Proposed Action:	Brush Control in Red River Basin
BACKGROUND INFORMATION	
Jurisdiction/Location:	Wichita County, City of Iowa Park, City of Burkburnett, City of Cashion, City of Electra, City of Pleasant Valley
Project Description:	Brush control using airborne spray techniques have been successful in many areas of Texas.
Benefit:	The 2015/2016 Texas Almanac estimates Wichita County property values at \$4.8B; annual wages at \$362M; and annual retail sales at \$1.2B (WCTMWD estimates B:C = 2+ for brush control)
Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Estimated Cost:	\$200 per acre, 2,000 acres \$400,000 for Phase 1
Potential Funding Sources:	FEMA (Disaster Response), Red River Authority, Texas Commission on Environmental Quality, Texas Water Development Board, Texas State Soil Water Conservation Board, City of Wichita Falls
Lead Agency/Department Responsible:	Wichita County OEM
Implementation Schedule:	108 months

2024 ANALYSIS:	
Wichita County	Defer to Plan Update. Funding not available
City of Burkburnett	Defer to Plan Update. Funding not available
City of Cashion Community	Defer to Plan Update.
City of Electra	Defer to Plan Update.
City of Iowa Park	Delete Action. City no longer wishes to implement.
City of Pleasant Valley	Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

Wichita County & Participating Jurisdictions – Action #6	
Proposed Action:	Construct Needed Water System Improvements in the Red River “B” Region for Wichita County
BACKGROUND INFORMATION	
Jurisdiction/Location:	Wichita County, City of Iowa Park, City of Burkburnett, City of Cashion, City of Electra, City of Pleasant Valley
Project Description:	The Chloride Control project is included in the State Water Plan as one of the feasible strategies for meeting the water supply needed in Region B. The primary strategy for reducing the flow of highly saline waters to the Red River is to impound these flows behind low flow dams and pump the saline water to off channel brine reservoirs where the water evaporates or is disposed of by deep well injection. During high flow periods, when the chloride concentration is lower, waters flow over the low flow dams and proceed downstream.
Benefit:	The 2015/2016 Texas Almanac estimates Wichita County property values at \$4.8B; annual wages at \$362M; and annual retail sales at \$1.2B (B:C = 17.1 for D1 + D2 +D4)
Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Estimated Cost:	\$63 million
Potential Funding Sources:	Texas Water Development Board, Texas State Legislature Budget (Line Item), City of Electra, City of Wichita Falls
Lead Agency/Department Responsible:	Wichita County Water Improvement District No. 2, City of Electra, City of Wichita Falls
Implementation Schedule:	120 months

2024 ANALYSIS:	
Wichita County	Defer to Plan Update. Funding not available
City of Burkburnett	Defer to Plan Update. Funding not available
City of Cashion Community	Defer to Plan Update.
City of Electra	Defer to Plan Update.
City of Iowa Park	Delete Action. City no longer wishes to implement.
City of Pleasant Valley	Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

Wichita County & Participating Jurisdictions – Action #7	
Proposed Action:	Tornado “Safe Rooms” Public Education
BACKGROUND INFORMATION	
Jurisdiction/Location:	Wichita County, City of Iowa Park, City of Burkburnett, City of Cashion, City of Electra, City of Pleasant Valley.
Project Description:	Public education by sponsoring “Safe Room” workshops for communities, interested homeowners, design professionals and contractors. Invite recognized experts such as Texas Tech University Wind Science and Engineering Research Center, FEMA, TDEM, and others to provide technical and funding information throughout Wichita County.
Benefit:	Prevent loss of life and injury
Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado
Estimated Cost:	Staff Time within existing budgets
Potential Funding Sources:	FEMA (Disaster Response)
Lead Agency/Department Responsible:	Wichita County Office of Emergency Management
Implementation Schedule:	Project triggered by Funding availability.

2024 ANALYSIS:	
Wichita County	Completed. Flyers and information published and made available at Community Events.
City of Burkburnett	Completed. Utilize Wichita County safe room education program
City of Cashion Community	Defer to Plan Update.
City of Electra	Defer to Plan Update.
City of Iowa Park	Completed. Public website and social media platforms are available for public notifications.
City of Pleasant Valley	Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

Wichita County & Participating Jurisdictions – Action #8	
Proposed Action:	Tornado “Safe Room” Construction
BACKGROUND INFORMATION	
Jurisdiction/Location:	Wichita County, City of Iowa Park, City of Burkburnett, City of Cashion, City of Electra, City of Pleasant Valley
Project Description:	Participate in the FEMA Individual “Safe Room” program by accepting applications from the citizens of Wichita County to have licensed NTSA or ATSA approved Safe Rooms installed in private residences. In the event of a disaster, installation of the safe rooms by private citizens will provide protection and increase the life-saving capabilities of the citizens of Wichita County.
Benefit:	Prevent loss of life and injury
Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)	Structure Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado
Estimated Cost:	Individual Homeowners \$3,000
Potential Funding Sources:	HMGP
Lead Agency/Department Responsible:	Wichita County Judge/Office of Emergency Management
Implementation Schedule:	Project Triggered by Funding availability

2024 ANALYSIS:	
Wichita County	Defer to Plan Update. Grants submitted – Awaiting funding.
City of Burkburnett	Defer to Plan Update. Grants submitted through Wichita County waiting on approval or denial of funding.
City of Cashion Community	Defer to Plan Update.
City of Electra	Defer to Plan Update.
City of Iowa Park	Completed. Several tornado safe rooms installed in City and ETJ under program managed by Wichita County. Public website and social media platforms are available for public notifications.
City of Pleasant Valley	Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

Wichita County & Participating Jurisdictions – Action #9	
Proposed Action:	Building Code Improvements
BACKGROUND INFORMATION	
Jurisdiction/Location:	Wichita County, City of Iowa Park, City of Burkburnett, City of Cashion, City of Electra, City of Pleasant Valley
Project Description:	Phase 1 - Each community will evaluate building code requirements and adopt improvements that will result in more wind and tornado resistant structures. The NORTEX Regional Planning Commission may be the ideal agency to identify possible building code improvements, sponsor code workshops and assist communities with code enforcement. Phase 2 – Communities that have adopted building codes should conduct annual code reviews and update codes as changes occur. At a minimum, national building codes should be followed with regionally standard code requirements such as including clips on framing members to strengthen structures and reduce damage from high winds. The rural areas of Wichita County do not have any building code requirements.
Benefit:	Disaster resistant construction. Reduced damages from future events such as tornado, hail and high winds.
Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado
Estimated Cost:	Staff time within existing Budgets
Potential Funding Sources:	FEMA
Lead Agency/Department Responsible:	NORTEX Regional Planning Commission
Implementation Schedule:	Evaluation in 2017 (Phase 1), Code updates phased 24 months (Phase 2)

2024 ANALYSIS:	
Wichita County	Defer to Plan Update. Wichita County does not have any adopted building or zoning requirements.
City of Burkburnett	Defer to Plan Update.
City of Cashion Community	Defer to Plan Update.
City of Electra	Defer to Plan Update.
City of Iowa Park	Completed. Adopted 2015 International Building Codes. Codes are enforced accordingly.
City of Pleasant Valley	Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

Wichita County & Participating Jurisdictions – Action #10	
Proposed Action:	Encourage the City of Cashion to participate in the NFIP.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Wichita County, City of Iowa Park, City of Burkburnett, City of Cashion, City of Electra, City of Pleasant Valley
Project Description:	FEMA has published Flood Insurance Rate Maps designating Special Flood Hazard Areas (SFHA) throughout the Wichita County study area. Currently only the City of Cashion does not participate in the NFIP and flood insurance is not available in the community. The Wichita County Mitigation Planning Committee encourages the City of Cashion to join the NFIP and adopt a flood damage prevention ordinance.
Benefit:	Availability of flood insurance, HMGP and disaster assistance
Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Estimated Cost:	Staff time within existing budgets
Potential Funding Sources:	Current Operating Budget
Lead Agency/Department Responsible:	City of Cashion OEM
Implementation Schedule:	60 months

2024 ANALYSIS:	
Wichita County	Completed.
City of Burkburnett	Completed.
City of Cashion Community	Completed. Wichita County manages the floodplain development under an agreement. There is very little floodplain in the Cashion area. Cashion is a type 4 community, and all actions are accomplished by the County.
City of Electra	Defer to Plan Update.
City of Iowa Park	Delete Action. City no longer wishes to implement
City of Pleasant Valley	Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

Wichita County & Participating Jurisdictions – Action #11	
Proposed Action:	Reduce Flood Losses and Increase Flood Insurance Coverage in Wichita County
BACKGROUND INFORMATION	
Jurisdiction/Location:	Wichita County, City of Iowa Park, City of Burkburnett, City of Cashion, City of Electra, City of Pleasant Valley
Project Description:	Sponsor NFIP Region 6 Flood Insurance Workshops for local community floodplain managers, insurance agents, developers, homeowners, and the general public to inform attendees that flood insurance is available for all structures located in communities that participate in the NFIP and flood insurance policies protect against losses both for structures and contents.
Benefit:	Availability of flood insurance, HMGP and disaster assistance
Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Estimated Cost:	Staff Time within existing budgets
Potential Funding Sources:	Wichita County
Lead Agency/Department Responsible:	NORTEX Regional Planning Commission
Implementation Schedule:	60 months

2024 ANALYSIS:	
Wichita County	Completed. Accomplished through buyback program.
City of Burkburnett	Delete Action. Not applicable to city limits
City of Cashion Community	Defer to Plan Update.
City of Electra	Defer to Plan Update.
City of Iowa Park	Defer to Plan Update. Floodplain Administrator is Certified Floodplain Manager who receives annual continuing education. Additional training is in order.
City of Pleasant Valley	Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

Wichita County & Participating Jurisdictions – Action #12	
Proposed Action:	Improve Flood Warning in Wichita County
BACKGROUND INFORMATION	
Jurisdiction/Location:	Wichita County, City of Iowa Park, City of Burkburnett, City of Cashion, City of Electra, City of Pleasant Valley
Project Description:	Identify sites where stream and electronic rain gages are needed in the Wichita County study area and coordinate installation requests with the USGS, and RRA. This action item includes coordination with the Wichita County OEM to expand the rainfall network rain gauges where needed. In a significant rain event, the installation of electronic streams and rain gauges will provide active monitoring of the water rise from pre-established locations, such as the EOC. The expansion of streams and electronic rain gauges will provide Wichita County Emergency Management quicker advance notice of potential problems and provides a more timely notice to the public.
Benefit:	Prevent loss of life and injury. Minimize property damage.
Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Estimated Cost:	\$20,000 estimated cost to install automated rain gage network; \$20,000 estimated installation cost to install each stream gage; \$1,000 per month estimated maintenance cost (USGS Gage)
Potential Funding Sources:	NOAA/NWS, USGS, RRA
Lead Agency/Department Responsible:	Wichita County Office of Emergency Management
Implementation Schedule:	36 months using a priority system as funds become available

2024 ANALYSIS:	
Wichita County	Defer to Plan Update. Areas within Wichita County have been identified, but funding to install has not been found
City of Burkburnett	Defer to Plan Update. Funding not available
City of Cashion Community	Defer to Plan Update.
City of Electra	Defer to Plan Update.
City of Iowa Park	Defer to Plan Update.
City of Pleasant Valley	Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

Wichita County & Participating Jurisdictions – Action #13	
Proposed Action:	Identify and conduct dam failure analysis on high hazard dams that affect Wichita County.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Wichita County, City of Iowa Park, City of Burkburnett, City of Cashion, City of Electra, City of Pleasant Valley
Project Description:	In order to obtain accurate data and confirm the conclusion that the spillways will contain the water from a dam breach, Wichita County and the Cities of Burkburnett, Electra, Iowa Park, will request a dam analysis during this planning period. A request will be made for a review of the National Inventory of Dams and technical data and studies from the Texas Water Development Board, U. S. Army Corps of Engineers, NRCS and other sources and coordinate with federal and state agencies to identify high hazard dams that impact areas in Wichita County. Identify and contact dam owners (public and private) and request dam break analysis reports if available. Conduct dam failure analysis on identified high hazard dams. Coordinate with Federal and state agencies and dam owners to initiate projects to make necessary dam repairs or breach high hazard dams, whichever is applicable.
Benefit:	Future development constructed safely. Estimated benefit is 10:1 therefore the \$1,200,000 total study cost would result in \$12M in benefits. (B:C = 10+/-)
Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)	Local Plans and Regulations, Structure and Infrastructure
MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Estimated Cost:	\$20,000 estimated county-wide study cost; \$20,000 to \$60,000 estimated cost per dam for failure analysis; \$240,000 estimated cost to conduct dam failure analysis for six (6) High Hazard Dams
Potential Funding Sources:	TWDB, NRCS, FEMA (future Wichita County Flood Insurance Study)
Lead Agency/Department Responsible:	Wichita Falls
Implementation Schedule:	Existing dam failure analyses and field information to be gathered in 2017, and a report/plan developed in 36 Months. Plan implementation timeline should be determined as a part of the planning process.

SECTION 17: PREVIOUS ACTIONS

2024 ANALYSIS:	
Wichita County	Delete Action. Wichita County is not responsible for any dams in the rural area.
City of Burkburnett	Delete Action. No dams within city limits
City of Cashion Community	Defer to Plan Update.
City of Electra	Defer to Plan Update.
City of Iowa Park	Completed. The North Fork Buffalo Creek Reservoir Dam, the Lake Iowa Park Dam, and the Gordon Lake Dam were analyzed, and Emergency Operations Plans were prepared for each dam. In addition, an Operations & Maintenance Manual was developed
City of Pleasant Valley	Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

Wichita County & Participating Jurisdictions – Action #14	
Proposed Action:	Provide Training for Local Floodplain Managers, CFMs, and CEMs. Initiate a coordination efforted to identify workshops and training activities between NORTEX and FEMA Region VI, NFIP Regional Office, TDEM, TCEQ, TWDB, TFMA, EMAT and ASFPM.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Wichita County, City of Iowa Park, City of Burkburnett, City of Cashion, City of Electra, City of Pleasant Valley
Project Description:	Host floodplain management training such as FEMA's FPM Training Course, "Managing Floodplain Development through the NFIP", hosting NFIP Workshops and TDEM workshops for emergency managers and CEM's. Proposed Workshops and training activities: HAZMAP Plan Adoption and Plan Maintenance (TDEM), Managing Floodplain Development through the NFIP (FEMA), Flood Mitigation Assistance Plans (TWDB), Flood Protection Planning Grants (TWDB), Floodplain Manager Workshops (TCEQ), NFIP Workshops for community officials, lenders, agents, developers, Substantial Damage Estimator (FEMA), TFMA Conferences, HAZUS Workshop (FEMA), and Building Code Workshops, Tornado Safe Room Design and Construction Workshops (Texas Tech/FEMA), Emergency Manager Workshops and Exercises
Benefit:	Future development constructed safely.
Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Estimated Cost:	Staff time within existing budgets
Potential Funding Sources:	TWDB – FMA, TDEM – HMGP, FEMA Region VI
Lead Agency/Department Responsible:	NORTEX Regional Planning Commission, Wichita County
Implementation Schedule:	Annually from 72 months

2024 ANALYSIS:	
Wichita County	Defer to Plan Update. Some training has been completed, but delays were encountered during the COVID pandemic.

SECTION 17: PREVIOUS ACTIONS

City of Burkburnett	Defer to Plan Update. Delays due to COVID pandemic.
City of Cashion Community	Defer to Plan Update.
City of Electra	Defer to Plan Update.
City of Iowa Park	Completed and Defer to Plan Update. Floodplain Administrator is Certified Floodplain Manager who receives annual continuing education. Additional Certified Floodplain Managers and continuing education training are in order.
City of Pleasant Valley	Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

Wichita County Participating Jurisdictions – Action #15		
	Proposed Action:	Acquisition and Relocation or Elevation of Structures
BACKGROUND INFORMATION		
	Jurisdiction/Location:	Wichita County, City of Iowa Park, City of Burkburnett, City of Cashion, City of Electra, City of Pleasant Valley
	Project Description:	Assist local community efforts to identify potential structures and initiate acquisition and relocation or elevation projects to reduce the risk of future flood losses. Create a database of Repetitive Loss Properties, properties that have had flood insurance claims, and properties located in areas of high flood risk. Assist communities with HMGP, FMA, Federal Flood Protection Projects, TWDB Flood Protection Planning Grants, and community funded buyout and elevation projects. Sponsor Buyout Conferences, and workshops to inform and assist local communities and the general public on methods to reduce flood losses.
	Benefit:	Removal of approximately 137 repetitive loss properties. Assuming 4 more losses in the life of the structures equals a savings of \$33M (B:C =2+)
	Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)	Education and Awareness Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Estimated Cost:	\$16.5, \$13,700,000 acquisition and relocation, \$2,740,000, \$2,740,000 demolition (ICC Funds)
Potential Funding Sources:	HMGP, ICC
Lead Agency/Department Responsible:	Wichita County OEM/Floodplain Manager
Implementation Schedule:	Buyout plan to be developed in 48 Months and carried out as funding becomes available or a disaster occurs.

2024 ANALYSIS:	
Wichita County	Completed.
City of Burkburnett	Defer to Plan Update.
City of Cashion Community	Defer to Plan Update.
City of Electra	Defer to Plan Update.
City of Iowa Park	Completed.
City of Pleasant Valley	Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

Wichita County & Participating Jurisdictions – Action #16	
Proposed Action:	Increase Emergency Management Staff in the Cities of Burkburnett, Cashion, Iowa Park, Electra and Pleasant Valley and the Wichita County OEM
BACKGROUND INFORMATION	
Jurisdiction/Location:	Wichita County, City of Iowa Park, City of Burkburnett, City of Cashion, City of Electra, City of Pleasant Valley
Project Description:	Wichita County and communities in the County have additional emergency operations responsibilities as a result of the Department of Homeland Security, the Federal Emergency Management Agency and the Texas Division of Emergency Management following the Disaster of 9–11 (2001) and the Disaster Mitigation Act of 2000. Additional staff is needed in the Wichita Office of Emergency Management and Other Wichita County Communities to meet these needs.
Benefit:	Prevent loss of life and injury. Minimize property damage.
Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Emergency Preparedness
Estimated Cost:	\$55,000 initial equipment costs, \$100,000 per employee per year (estimated cost for salary, support, equipment, and benefits.
Potential Funding Sources:	Department of Homeland Security (DHS), FEMA and individual communities
Lead Agency/Department Responsible:	Wichita County OEM
Implementation Schedule:	60 months

2024 ANALYSIS:	
Wichita County	Defer to Plan Update. Discussions were held, but funding has not been made available.
City of Burkburnett	Defer to Plan Update. No changes in staff.
City of Cashion Community	Defer to Plan Update.
City of Electra	Defer to Plan Update.
City of Iowa Park	Defer to Plan Update. All employees are Emergency Management personnel and should receive ICS and NIIMS training. Elected officials, volunteer fire fighters and EMT's should also receive training.
City of Pleasant Valley	Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

Wichita County & Participating Jurisdictions – Action #17	
Proposed Action:	Storm Ready Designation for Wichita County Communities
BACKGROUND INFORMATION	
Jurisdiction/Location:	Wichita County, City of Iowa Park, City of Burkburnett, City of Cashion, City of Electra, City of Pleasant Valley
Project Description:	Wichita County unincorporated areas and the City of Burkburnett have been designated as a “Storm Ready” community by the National Weather Service (NWS). Coordinate with the NWS to assist the City of Iowa Park, City of Cashion, City of Electra and City of Pleasant Valley in acquiring a designation of “Storm Ready. The Mitigation Plan Goal is to classify every community within Wichita County as “Storm Ready”.
Benefit:	Prevent loss of life and injury. Minimize property damage.
Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Emergency Preparedness
Estimated Cost:	Existing staff and budget
Potential Funding Sources:	NWS
Lead Agency/Department Responsible:	NORTEX Regional Planning Commission
Implementation Schedule:	60 months

2024 ANALYSIS:	
Wichita County	Completed.
City of Burkburnett	Completed.
City of Cashion Community	Defer to Plan Update.
City of Electra	Defer to Plan Update.
City of Iowa Park	Defer to Plan Update.
City of Pleasant Valley	Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

Wichita County & Participating Jurisdictions – Action #18	
Proposed Action:	Designate HAZMAT Cargo Routes in Wichita County
BACKGROUND INFORMATION	
Jurisdiction/Location:	Wichita County, City of Iowa Park, City of Burkburnett, City of Cashion, City of Electra, City of Pleasant Valley
Project Description:	A Hazardous Materials Transportation Study was completed by the Texas A&M Transportation Institute. The study identified HAZMAT highway, railway and pipeline transportation routes through Wichita County. The goal is to designate and placard HAZMAT Routes in critical areas.
Benefit:	Minimize damages and potential loss of life and injury. Savings in one HAZMAT cleanup (in wrong location) can be \$25,000+/-.
Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	HAZMAT Cargo
Estimated Cost:	\$10,000 estimated cost to placard selected
Potential Funding Sources:	TXDOT, TDEM, FEMA, Wichita County
Lead Agency/Department Responsible:	Wichita County OEM and LEPC
Implementation Schedule:	24 months to install signage, 120 months signage maintenance

2024 ANALYSIS:	
Wichita County	Defer to Plan Update. Funding not available.
City of Burkburnett	Defer to Plan Update. Funding not available.
City of Cashion Community	Defer to Plan Update.
City of Electra	Defer to Plan Update.
City of Iowa Park	Defer to Plan Update.
City of Pleasant Valley	Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

Wichita County & Participating Jurisdictions – Action #19	
Proposed Action:	Backup Power for Fire Stations
BACKGROUND INFORMATION	
Jurisdiction/Location:	Wichita County, City of Iowa Park, City of Burkburnett, City of Cashion, City of Electra, City of Pleasant Valley
Project Description:	Eight Volunteer Fire Departments in Wichita County do not have backup power. This Action Item is to install emergency generators for backup power at all fire stations in Wichita County. A survey should be conducted to evaluate which stations, if not all, should have emergency backup power installed.
Benefit:	Minimize damages and potential loss of life and injury. Savings from one fire response can easily be \$100,000 to \$1M (B:C = 6.25+/-)
Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire/Fire
Estimated Cost:	\$ 3,000 study cost; \$20,000 cost per fire station, \$180,000 estimated cost for the Nine Volunteer Fire Departments
Potential Funding Sources:	FEMA, Department of Homeland Security, Wichita Co.
Lead Agency/Department Responsible:	Wichita County OEM
Implementation Schedule:	Study initiated in 2005; Phased construction from 36 Months

2024 ANALYSIS:	
Wichita County	Defer to Plan Update. Funding not available.
City of Burkburnett	Completed. Generators are in place.
City of Cashion Community	Defer to Plan Update.
City of Electra	Defer to Plan Update.
City of Iowa Park	Defer to Plan Update. Existing Police Station backup generator and fuel tank will be incorporated into New Fire Station to be completed in 2024.
City of Pleasant Valley	Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

Wichita County & Participating Jurisdictions – Action #20	
Proposed Action:	Public Education and Strengthen Urban/Wild Land Interface
BACKGROUND INFORMATION	
Jurisdiction/Location:	Wichita County, City of Iowa Park, City of Burkburnett, City of Cashion, City of Electra, City of Pleasant Valley
Project Description:	Using the principles established by the Texas Forest Service “Ready, Set, Go” program, create and maintain a public education program, in conjunction with the local fire departments, to inform the residents of Wichita County how to mitigate wildfire danger around their homes, businesses, property, and the community which will lessen property loss and damage.
Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Estimated Cost:	Employee time to develop and implement project
Potential Funding Sources:	Texas Forest Service, Grants
Lead Agency/Department Responsible:	Wichita County OEM
Implementation Schedule:	120 months

2024 ANALYSIS:	
Wichita County	Completed. Flyers and information published and made available at Community Events.
City of Burkburnett	Completed. Flyers and information published, and firefighters educated on wildfire danger.
City of Cashion Community	Defer to Plan Update.
City of Electra	Defer to Plan Update.
City of Iowa Park	Defer to Plan Update.
City of Pleasant Valley	Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

Wichita County & Participating Jurisdictions – Action #21	
Proposed Action:	Reduce Impacts on Elderly and Low-Income Persons
BACKGROUND INFORMATION	
Jurisdiction/Location:	Wichita County, City of Iowa Park, City of Burkburnett, City of Cashion, City of Electra, City of Pleasant Valley
Project Description:	Wichita County and participating community Emergency Managers to launch a public notification effort during extreme heat periods urging elderly and low-income persons to seek help if needed. Cooling stations will be in all of the participating communities in their public libraries or if unavailable, the libraries of neighboring jurisdictions. Volunteer organizations such as Rotary International, Lions Club, Jaycees, Red Cross, United Way, and others should be urged to participate. Power Companies will be notified by the Wichita County Emergency Manager and requested to participate in the effort to distribute box fans and make minor repairs to air conditioners. The Wichita County Office of Emergency Management will coordinate with participating community emergency managers and take the lead. The initial action will include newspaper and radio announcements. Public announcements will define the hazard, describe heat related health risks and provide tips on how to prevent illness. Health care officials can play an important role by providing information to newspapers and radio stations. For initial planning purposes, a maximum temperature in excess of 100 degrees that occurs on two or more consecutive days will initiate this Action.
Benefit:	Minimizes potential loss of life and heat related illness. Savings from saving one life gives this action a maximum B:C ratio.
Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Extreme Heat
Estimated Cost:	Locally budgeted staff time
Potential Funding Sources:	City Budget
Lead Agency/Department Responsible:	Wichita County OEM
Implementation Schedule:	36 months

SECTION 17: PREVIOUS ACTIONS

2024 ANALYSIS:	
Wichita County	Completed. Flyers and information published and made available at Community Events.
City of Burkburnett	Completed. Provide information through public education.
City of Cashion Community	Defer to Plan Update.
City of Electra	Defer to Plan Update.
City of Iowa Park	Completed. Iowa Park Friendly Door Senior Center is utilized as cooling station. Public website and social media platforms are available for public notifications.
City of Pleasant Valley	Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

Wichita County & Participating Jurisdictions – Action #22	
Proposed Action:	Distribution of Fans and HVAC Repairs
BACKGROUND INFORMATION	
Jurisdiction/Location:	Wichita County, City of Iowa Park, City of Burkburnett, City of Cashion, City of Electra, City of Pleasant Valley
Project Description:	A joint effort by local power companies, volunteer organizations, Wichita County and participating communities and others will solicit funds to purchase and distribute box fans and make air conditioner repairs.
Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Extreme Heat
Estimated Cost:	\$2,000 to purchase and distribute 100 box fans \$3,000 estimated cost for a/c repairs
Potential Funding Sources:	United Way, Rotary Clubs, Lions Clubs, American Red Cross, Churches and charitable organizations, power companies
Lead Agency/Department Responsible:	Wichita County OEM
Implementation Schedule:	24 months during Periods of Extreme Heat, annually in June, July and August

2024 ANALYSIS:	
Wichita County	Defer to Plan Update. Funding not available.
City of Burkburnett	Completed and Defer to Plan Update. Funding not available.
City of Cashion Community	Defer to Plan Update.
City of Electra	Defer to Plan Update
City of Iowa Park	Defer to Plan Update.
City of Pleasant Valley	Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

Wichita County & Participating Jurisdictions – Action #23	
Proposed Action:	Winter Storms Implement a tree trimming program that routinely clears tree limbs hanging in right-of-way
BACKGROUND INFORMATION	
Jurisdiction/Location:	Wichita County, City of Iowa Park, City of Burkburnett, City of Cashion, City of Electra, City of Pleasant Valley
Project Description:	A joint effort by local power companies, Wichita County Precincts and local road and grounds departments to identify and trim limbs clear tree limbs hanging in the rights-of-way to mitigate the loss of electricity from falling limbs.
Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Ice and Winter Storms
Estimated Cost:	\$3,000 – \$10,000 depending on growth
Potential Funding Sources:	Power Companies, Wichita County, City Budgets
Lead Agency/Department Responsible:	Wichita County OEM
Implementation Schedule:	36 months during non-winter months, annually

2024 ANALYSIS:	
Wichita County	Completed and Defer to Plan Update. Wichita County Public Works (Precincts) routinely does this with limited budgeted funds.
City of Burkburnett	Defer to Plan Update.
City of Cashion Community	Defer to Plan Update.
City of Electra	Completed and Defer to Plan Update. City completes annually. Update cost to \$25,000
City of Iowa Park	Defer to Plan Update.
City of Pleasant Valley	Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

Wichita County & Participating Jurisdictions – Action #24	
Proposed Action:	Develop a Public Awareness Program for Ice and Winter Storms
BACKGROUND INFORMATION	
Jurisdiction/Location:	Wichita County, City of Iowa Park, City of Burkburnett, City of Cashion, City of Electra, City of Pleasant Valley
Project Description:	Develop a public awareness program related to ice and winter storms, including road conditions, safety tips, an “Are you Prepared” Campaign, travel strategies, care and maintenance of residences and plants.
Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Ice and Winter Storms
Estimated Cost:	\$3,000 - \$10,000
Potential Funding Sources:	Power Companies, Wichita County, City Budgets
Lead Agency/Department Responsible:	Wichita County OEM
Implementation Schedule:	36 months during non-winter months, annually

2024 ANALYSIS:	
Wichita County	Completed. Flyers and information published and made available at Community Events.
City of Burkburnett	Completed. Public information through flyers and social media.
City of Cashion Community	Defer to Plan Update.
City of Electra	Defer to Plan Update
City of Iowa Park	Completed. Public Notices and Public Service Announcements posted on City website and various social media platforms.
City of Pleasant Valley	Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

Wichita County & Participating Jurisdictions – Action #25	
Proposed Action:	Building Code Improvements
BACKGROUND INFORMATION	
Jurisdiction/Location:	Wichita County, City of Iowa Park, City of Burkburnett, City of Cashion, City of Electra, City of Pleasant Valley
Project Description:	<p>Phase 1 - Each community will evaluate building code requirements and adopt improvements that include a recommendation to use more hail resistant roofing and glass. This will likely decrease personal injuries and property damage in future hailstorms. The NORTEX Regional Planning Commission may be the ideal agency to identify possible building code improvements, sponsor code workshops and assist communities with code enforcement.</p> <p>Phase 2 – Communities that have adopted building codes should conduct annual code reviews and update codes as changes occur.</p>
Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hail
Estimated Cost:	Staff time under current budgets (workshops)
Potential Funding Sources:	FEMA, Department of Homeland Security, Grants
Lead Agency/Department Responsible:	NORTEX Regional Planning Commission
Implementation Schedule:	Evaluation in 12 Months (Phase 1), 36 Months (Phase 2)

2024 ANALYSIS:	
Wichita County	Defer to Plan Update. Wichita County does not enforce state building codes, nor do we have a program or funding in place to accomplish this.
City of Burkburnett	Defer to Plan Update.
City of Cashion Community	Defer to Plan Update.
City of Electra	Defer to Plan Update
City of Iowa Park	Completed. 2015 International Building Codes adopted by City.
City of Pleasant Valley	Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

Wichita County & Participating Jurisdictions – Action #26		
	Proposed Action:	Develop a Public Awareness Program for Hail
BACKGROUND INFORMATION		
	Jurisdiction/Location:	Wichita County, City of Iowa Park, City of Burkburnett, City of Cashion, City of Electra, City of Pleasant Valley
	Project Description:	Develop a public awareness program related to hailstorms, including road safety tips, home safety tips, a are you prepared campaign, travel strategies, care and maintenance of residences and plants. A joint effort to increase and maintain public awareness of severe hailstorms and the benefits of mitigation activities through education aimed at household and businesses and increase targeting of special needs population. By increasing public awareness, public safety is increased with a decrease in personal injuries and property damage.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hail
Estimated Cost:	Employee time to develop and implement project
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Wichita County OEM
Implementation Schedule:	36 months during spring, annually

2024 ANALYSIS:	
Wichita County	Completed. Flyers and information published and made available at Community Events.
City of Burkburnett	Completed. Public information through flyers and social media.
City of Cashion Community	Defer to Plan Update.
City of Electra	Defer to Plan Update
City of Iowa Park	Completed. Public Notices and Public Service Announcements posted on City website and various social media platforms.
City of Pleasant Valley	Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

Wichita County & Participating Jurisdictions – Action #27	
Proposed Action:	Develop a Public Awareness Program for Lightning.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Wichita County, City of Iowa Park, City of Burkburnett, City of Cashion, City of Electra, City of Pleasant Valley
Project Description:	Develop a public education program to include information on surge protectors, lightning rods, safe rooms, safety tips and other elements. A joint effort to increase and maintain public awareness of the dangers associated with lightning and the benefits of mitigation activities through education aimed at households and businesses. By increasing public awareness, public safety is increased with a decrease in personal injuries and property damage.
Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Lightning
Estimated Cost:	Employee time to develop and implement project
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Wichita County OEM
Implementation Schedule:	36 months during spring, annually

2024 ANALYSIS:	
Wichita County	Completed. Flyers and information published and made available at Community Events.
City of Burkburnett	Completed. Public information through flyers and social media.
City of Cashion Community	Defer to Plan Update.
City of Electra	Defer to Plan Update
City of Iowa Park	Completed. Public Notices and Public Service Announcements posted on City website and various social media platforms.
City of Pleasant Valley	Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

Wichita County & Participating Jurisdictions – Action #28		
	Proposed Action:	Install lightning rods on existing and future communication infrastructures and other critical facilities
BACKGROUND INFORMATION		
	Jurisdiction/Location:	Wichita County, City of Iowa Park, City of Burkburnett, City of Cashion, City of Electra, City of Pleasant Valley
	Project Description:	Install and maintain lightning rods on existing and future communication and critical facilities operated by Wichita County, and in the Cities of Burkburnett, Electra, and Iowa Park, to include the fire departments, police departments, public works, and city halls. Also included would be the volunteer fire departments operating in the community not associated with a municipal government and the city administration buildings in Cashion and Pleasant Valley.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Lightning
Estimated Cost:	To be determined
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Wichita County OEM
Implementation Schedule:	60 months

2024 ANALYSIS:	
Wichita County	Defer to Plan Update. Action pending with approval of submitted FEMA mitigation funding application.
City of Burkburnett	Defer to Plan Update.
City of Cashion Community	Defer to Plan Update.
City of Electra	Defer to Plan Update.
City of Iowa Park	Defer to Plan Update.
City of Pleasant Valley	Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

CITY OF WICHITA FALLS

City of Wichita Falls – Action #1	
Proposed Action:	Development of Ringgold Project to provide another water reservoir for the City of Wichita Falls.
BACKGROUND INFORMATION	
Site and Location:	City-wide with the proposed reservoir being constructed in Clay County.
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Protect public health and safety; Protect existing and new properties; Promote growth in a sustainable manner; Maximize the use of outside sources for funding.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Effect on new/existing buildings:	This action will not directly affect new buildings and existing buildings.
Priority (High, Moderate, Low):	High
Estimated Cost:	\$350,000,000
Potential Funding Sources:	Water/Sewer Fund, General Fund, Bond, FEMA Grant
Lead Agency/Department Responsible:	Public Works/Engineering
Implementation Schedule:	30-year implementation

2024 ANALYSIS:
Defer to Plan Update. Project is in the permitting phase. Utilizing Water/Sewer fund and Bonds to fund project.

SECTION 17: PREVIOUS ACTIONS

City of Wichita Falls – Action #2	
Proposed Action:	Develop and implement a drought contingency plan to include water conservation, building code requirements and mandatory water rationing.
BACKGROUND INFORMATION	
Site and Location:	City-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Protect public health and safety; Increase public understanding, support, and demand for hazard mitigation; Maximize the use of outside sources for funding.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Effect on new/existing buildings:	The effect to existing buildings will be minimal but could have an effect on new construction, new development and the economic stability of Wichita Falls.
Priority (High, Moderate, Low):	High
Estimated Cost:	\$25,000
Potential Funding Sources:	General Fund, FEMA Grant, Water/Sewer Fund
Lead Agency/Department Responsible:	Public Utilities/Planning/Emergency Management
Implementation Schedule:	Possible 3-year implementation

2024 ANALYSIS:
Completed. Water Conservation & Drought Contingency Plan was adopted in August of 2018. Utilized Water / Sewer Fund to Develop and implement this project.

SECTION 17: PREVIOUS ACTIONS

City of Wichita Falls – Action #3	
Proposed Action:	Develop brochure to inform citizens on water conservation and safety or procedures.
BACKGROUND INFORMATION	
Site and Location:	City-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Protect public health and safety; Increase public understanding, support, and demand for hazard mitigation; Maximize the use of outside sources for funding.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Effect on new/existing buildings:	While this action will not have a direct impact on new buildings, without conservation efforts, there will be no new development if no one moves to the area due to no water source. This action will reduce the effects of drought on existing buildings through increased awareness on water conservation.
Priority (High, Moderate, Low):	High
Estimated Cost:	\$50,000
Potential Funding Sources:	General Fund, FEMA Grant
Lead Agency/Department Responsible:	Planning/Emergency Preparedness Office/Public Utilities
Implementation Schedule:	Possible 5-year implementation

2024 ANALYSIS:
Completed and Defer to Plan Update. PSAs completed and use of social media. Currently in Stage 1 of drought conservation tips.

SECTION 17: PREVIOUS ACTIONS

City of Wichita Falls – Action #4	
Proposed Action:	Construct culverts and widen channels to reduce flooding in East Plum Creek Project.
BACKGROUND INFORMATION	
Site and Location:	City-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Protect public health and safety; Protect existing and new properties; Maximize the use of outside sources for funding.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This action will reduce the flooding area in a high traffic area where new buildings and construction are being developed. This area has numerous businesses and residential properties that are affected by localized flooding in the Plum Creek area. This project will reduce the flooding damage to existing buildings and structures in this area.
Priority (High, Moderate, Low):	Medium
Estimated Cost:	\$3,600,000
Potential Funding Sources:	General Fund, Storm Water Fund, FEMA Grant
Lead Agency/Department Responsible:	Public Works/Engineering
Implementation Schedule:	Possible completion in next 5 to 10 years

2024 ANALYSIS:
Completed. Utilized Storm Water Fund to complete this project.

SECTION 17: PREVIOUS ACTIONS

City of Wichita Falls – Action #5	
Proposed Action:	Create and Implement a Vegetation Removal Project to Control Flooding Along the Wichita River in Wichita Falls.
BACKGROUND INFORMATION	
Site and Location:	City-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Protect public health and safety; Protect existing and new properties; Maximize the use of outside sources for funding.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This action will encourage new development of buildings and residential dwellings along the Wichita River. This action dramatically reduces the effects of flooding on existing structures in the Wichita River area by reducing vegetation and over- growth that could and does cause blockage and backup of flowing river water.
Priority (High, Moderate, Low):	Medium
Estimated Cost:	\$50,000
Potential Funding Sources:	General Fund, FEMA Grant, Storm Water Fund
Lead Agency/Department Responsible:	Public Works/Engineering
Implementation Schedule:	2014-2016 implementation time frame

2024 ANALYSIS:
Completed and Defer to Plan Update. Update implementation to reflect annual continuation project. Update cost based on historical cost: \$150,000 annually has been allocated for clearing projects based on acreage.

SECTION 17: PREVIOUS ACTIONS

City of Wichita Falls – Action #6	
Proposed Action:	Public Outreach Program to provide education to the public to avoid driving or walking into flood water.
BACKGROUND INFORMATION	
Site and Location:	City-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Protect public health and safety; Increase public understanding, support, and demand for hazard mitigation; Maximize the use of outside sources for funding.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This mitigation action will not have a direct impact on new construction or new developments. This mitigation action will not have a direct impact on existing buildings or structures.
Priority (High, Moderate, Low):	Medium
Estimated Cost:	\$25,000
Potential Funding Sources:	General Fund, FEMA Grant
Lead Agency/Department Responsible:	Public Information Office/Emergency Management Office
Implementation Schedule:	Ongoing throughout the year

2024 ANALYSIS:
Defer to Plan Update. Update funding source to include Stormwater Fund.

SECTION 17: PREVIOUS ACTIONS

City of Wichita Falls – Action #7	
Proposed Action:	Develop and implement a program through FEMA that allows monetary assistance for homeowners to construct "safe room" shelters. This would be a reimbursement program providing up to \$3,000.00 per household to an individual who installs an approved safe room.
BACKGROUND INFORMATION	
Site and Location:	City-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Protect public health and safety; Protect existing and new properties; Maximize the use of outside sources for funding.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado, Hail, Severe Wind
Effect on new/existing buildings:	This action will allow developers and builders the opportunity to construct safe rooms at a reduced cost which will afford residents and workers a safer place. This action will allow owners of existing buildings and dwellings the opportunity to install safe rooms or approved tornado shelters.
Priority (High, Moderate, Low):	High
Estimated Cost:	\$3,000,000
Potential Funding Sources:	FEMA Grant
Lead Agency/Department Responsible:	Building Inspection
Implementation Schedule:	5 Year

2024 ANALYSIS:
Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

City of Wichita Falls – Action #8	
Proposed Action:	Provide community outreach that emphasizes the steps needed to remain safe in the case of a tornado.
BACKGROUND INFORMATION	
Site and Location:	City-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Protect public health and safety; Increase public understanding, support, and demand for hazard mitigation; Maximize the use of outside sources for funding.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado
Effect on new/existing buildings:	While this action does not have a direct impact on new construction, it has the potential of keeping developers and contractors aware of building in a tornado prone area. This action will not directly affect the impact of tornados on existing buildings.
Priority (High, Moderate, Low):	High
Estimated Cost:	\$3,000
Potential Funding Sources:	General Fund
Lead Agency/Department Responsible:	Public Information Office
Implementation Schedule:	Ongoing throughout the years

2024 ANALYSIS:
Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

City of Wichita Falls – Action #9	
Proposed Action:	Retrofit power poles to critical facilities with power wraps to strengthen the poles to prevent breakage.
BACKGROUND INFORMATION	
Site and Location:	City-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Protect public health and safety; Protect existing and new properties; Maximize the use of outside sources for funding.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Severe Wind
Effect on new/existing buildings:	This action will reduce the effects of severe wind on new development and on new construction. This action will reduce the effects of severe winds on existing buildings by eliminating one of the major causes of power outages.
Priority (High, Moderate, Low):	Medium
Estimated Cost:	\$500,000
Potential Funding Sources:	General Funds, FEMA Grant, Private Funds
Lead Agency/Department Responsible:	Public Utilities/Public Works
Implementation Schedule:	5-year implementation

2024 ANALYSIS:
Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

City of Wichita Falls – Action #10	
Proposed Action:	Develop public outreach program to advise citizens of the dangers from severe wind and the precautions they need to take to decrease damage from severe wind events.
BACKGROUND INFORMATION	
Site and Location:	City-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Protect public health and safety; Protect existing and new properties Increase public understanding, support, and demand for hazard mitigation; Maximize the use of outside sources for funding.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Severe Wind
Effect on new/existing buildings:	This action will reduce the effects of severe windstorms on new buildings by educating design professionals and architects to include severe wind mitigation actions in building design. This mitigation action will also reduce the effects of severe windstorms on existing buildings by educating homeowners and business owners on the benefits of protecting their properties with wind retrofits such as shutters and high wind straps.
Priority (High, Moderate, Low):	Medium
Estimated Cost:	\$5,000
Potential Funding Sources:	General Fund, FEMA Grant, Private Funds
Lead Agency/Department Responsible:	Public Information Office/ Emergency Preparedness Office
Implementation Schedule:	3-year implementation

2024 ANALYSIS:
Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

City of Wichita Falls – Action #11	
Proposed Action:	Install and maintain back-up power at City-owned critical infrastructures.
BACKGROUND INFORMATION	
Site and Location:	City-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Protect public health and safety; Protect existing and new properties; Maximize the use of outside sources for funding.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Severe Wind
Effect on new/existing buildings:	Building codes and funding could make critical facilities and businesses in the Wichita Falls area place power generation units in new development to ensure the continuity of operations. This action will reduce the effects of power outages on existing buildings and infrastructure by eliminating damage to circuits and equipment from loss of power.
Priority (High, Moderate, Low):	Medium
Estimated Cost:	\$500,000
Potential Funding Sources:	General Fund, FEMA Grant
Lead Agency/Department Responsible:	Emergency Preparedness
Implementation Schedule:	5-year

2024 ANALYSIS:
Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

City of Wichita Falls – Action #12	
Proposed Action:	Install hail resistant roofing on critical infrastructure buildings.
BACKGROUND INFORMATION	
Site and Location:	City-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Protect public health and safety; Increase public understanding, support, and demand for hazard mitigation; Maximize the use of outside sources for funding.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hail
Effect on new/existing buildings:	This action will reduce the effects of large, damaging hail on new buildings and critical infrastructure. This action will reduce the effects of hail on existing buildings through less damage to the structure by large hail and would defray costs to repair damage to the existing building and content.
Priority (High, Moderate, Low):	Medium
Estimated Cost:	\$2,500,000
Potential Funding Sources:	General Fund, FEMA Grant
Lead Agency/Department Responsible:	Public Works/Building Maintenance
Implementation Schedule:	Next 5-years

2024 ANALYSIS:
Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

City of Wichita Falls – Action #13	
Proposed Action:	Increase Hail Risk Awareness and Public Outreach to address the dangers of being out in large hail events
BACKGROUND INFORMATION	
Site and Location:	City-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Protect public health and safety; Protect existing and new properties; Maximize the use of outside sources for funding.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hail
Effect on new/existing buildings:	This mitigation action does not have much effect on new buildings. This action will have some effect on existing buildings by showing school children, business owners, event coordinators the dangers of hail and how to take safety precautions against damaging hail.
Priority (High, Moderate, Low):	Medium
Estimated Cost:	\$10,000
Potential Funding Sources:	General Fund, FEMA Grant
Lead Agency/Department Responsible:	Emergency Preparedness/Public Information
Implementation Schedule:	3-year implementation

2024 ANALYSIS:
Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

City of Wichita Falls – Action #14	
Proposed Action:	Install and maintain fuel reduction and fire-resistant landscaping at critical facilities.
BACKGROUND INFORMATION	
Site and Location:	City-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Protect public health and safety; Protect existing and new properties; Increase public understanding, support, and demand for hazard mitigation; Promote growth in a sustainable manner; Maximize the use of outside sources for funding.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Effect on new/existing buildings:	Building codes and ordinances would be enacted to provide a framework for builders and contractors to follow when building and developing new areas in and around city grasslands and overgrown areas. This would help protect new buildings. This will reduce the effects of wildfire on existing buildings by ensuring the fuel for a wildfire is not near a building.
Priority (High, Moderate, Low):	Medium
Estimated Cost:	\$300,000
Potential Funding Sources:	General Fund, FEMA Grant
Lead Agency/Department Responsible:	Parks/Fire Department
Implementation Schedule:	5-year implementation

2024 ANALYSIS:
Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

City of Wichita Falls – Action #15	
Proposed Action:	Develop and maintain a community wildfire protection plan.
BACKGROUND INFORMATION	
Site and Location:	City-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Protect public health and safety; Increase public understanding, support, and demand for hazard mitigation; Maximize the use of outside sources for funding.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Effect on new/existing buildings:	By making developers, contractors, and landowners aware of mitigation measures to reduce the effects of wildfire in our community, new constructed businesses, homes, and infrastructure can be protected from the dangers of wildfires. The action will reduce the effects wildfire has on existing buildings.
Priority (High, Moderate, Low):	Medium
Estimated Cost:	\$30,000
Potential Funding Sources:	General Fund, FEMA Grant, Texas A&M Forest Services
Lead Agency/Department Responsible:	Fire Department/Emergency Management
Implementation Schedule:	5-year implementation

2024 ANALYSIS:
Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

City of Wichita Falls – Action #16	
Proposed Action:	Implement policy to bury power lines in new and existing subdivisions to alleviate downed power lines.
BACKGROUND INFORMATION	
Site and Location:	City-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Protect public health and safety; Protect existing and new properties; Increase public understanding, support, and demand for hazard mitigation; Promote growth in a sustainable manner; Maximize the use of outside sources for funding.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Severe Winter Storm, Severe Wind, Tornado
Effect on new/existing buildings:	By requiring developers and contractors to bury power lines before new construction, buildings and structures would not be affected by downed power lines and poles. Existing building owners will be encouraged to bury power lines to reduce the chance of losing power due to downed power lines.
Priority (High, Moderate, Low):	High
Estimated Cost:	\$125,000
Potential Funding Sources:	General Fund
Lead Agency/Department Responsible:	Planning/Utilities
Implementation Schedule:	5-year

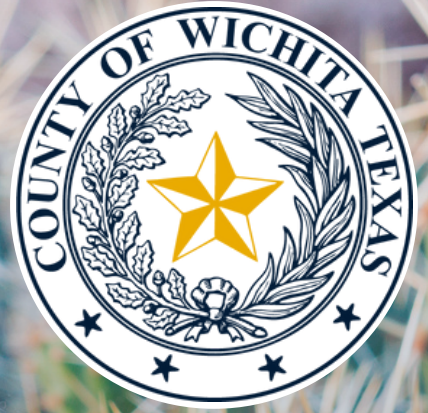
2024 ANALYSIS:
Defer to Plan Update.

SECTION 17: PREVIOUS ACTIONS

City of Wichita Falls – Action #17	
Proposed Action:	Develop public outreach program to advise citizens of the dangers from severe winter storms and the precautions they need to take due to severe winter storms.
BACKGROUND INFORMATION	
Site and Location:	City-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Protect public health and safety; Protect existing and new properties; Increase public understanding, support, and demand for hazard mitigation; Maximize the use of outside sources for funding.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Severe Winter Storm
Effect on new/existing buildings:	The action will reduce the effects of severe winter storms on new and existing buildings by educating homeowners and business owners to install protection devices.
Priority (High, Moderate, Low):	Medium
Estimated Cost:	\$5,000
Potential Funding Sources:	General Fund, FEMA Grant, Private Funds
Lead Agency/Department Responsible:	Public Information Office/Emergency Preparedness Office
Implementation Schedule:	3-year implementation

2024 ANALYSIS:
Defer to Plan Update.



SECTION 18 MITIGATION ACTIONS

SECTION 18: MITIGATION ACTIONS

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SUMMARY

As discussed in Section 2, at the mitigation workshop the planning team and stakeholders met to develop mitigation actions for each of the natural hazards included in the Plan Update. Each of the actions in this section were prioritized based on FEMA’s Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLEE) criteria necessary for the implementation of each action.

As part of the economic evaluation of the STAPLEE analysis, jurisdictions analyzed each action in terms of the overall costs, measuring whether the potential benefit to be gained from the action outweighed costs associated with it. As a result of this exercise, priority was assigned to each mitigation action by marking them as High (H), Moderate (M), or Low (L). An action that is ranked as “High” indicates that the action will be implemented as soon as funding is received. A “Moderate” action is one that may not be implemented right away depending on the cost and number of citizens served by the action. Actions ranked as “Low” indicate that they will not be implemented without first seeking grant funding and after “High” and “Moderate” actions have been completed.

Within each mitigation action worksheet, the Planning Team considered all potential funding sources that could be utilized to implement the proposed project. To ensure all potential funding resources are considered and are not limited to those sources identified within the action worksheet, please see Appendix G for a list of all available state and federal grant programs as of 2023. The Planning Team will continue to seek out other available funding sources during the 5-year cycle as notices of funding opportunity (NOFO) are released.

All mitigation actions created by Planning Team members are presented in this section in the form of Mitigation Action Worksheets. More than one hazard is sometimes listed for an action, if appropriate. Actions presented in this section represent a comprehensive range of mitigation actions per current state and FEMA Guidelines, including two actions, per hazard, and of two different types for each participating jurisdiction. The term county-wide action refers to Wichita County and the Cities of Burkburnett, Cashion Community, Electra, Iowa Park, Pleasant Valley, and Wichita Falls.

SECTION 18: MITIGATION ACTIONS

Table 18-1. Wichita County Mitigation Action Matrix

TYPE OF ACTION	
Action #1 – Plans/Regulations (Blue)	Action #4 – Structural (Orange)
Action #2 – Education/Awareness (Red)	Action #5 – Preparedness/Response (Black)
Action #3 – Natural Systems Protections (Green)	

Jurisdiction	Dam Failure	Drought	Extreme Heat	Earthquake	Flood	Lightning	Hail	Thunderstorm Wind	Tornado	Wildfire	Winter Storm
Wichita County	XXXX	XXX	XXXX	XXXX	XXXXX	XXX	XXX	XXX	XXXX	XXXX	XXXX
City of Burkburnett	N/A	XXX	XXX	XXXX	XXXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
City Cashion Community	N/A	XXX	XXX	XXXX	XXXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
City of Electra	N/A	XXX	XXX	XXXX	XXXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
City of Iowa Park	XXXX	XXX	XXX	XXXX	XXXX	XXX	XXX	XXX	XXXX	XXX	XXXX
City of Pleasant Valley	N/A	XXX	XXX	XXXX	XXXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
City of Wichita Falls	XXX	XX	XX	XX	XXX	XXX	XXX	XXX	XXX	XXXX	XXX

SECTION 18: MITIGATION ACTIONS

WICHITA COUNTY-WIDE

Wichita County-wide – Action #1	
Proposed Action:	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages.
BACKGROUND INFORMATION	
Site and Location:	County-wide including all participating jurisdictions
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promote hazard awareness and protect citizens from potential injuries and damages.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure (where applicable), Drought, Earthquake, Extreme Heat, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$5,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	County and Local Emergency Managers / Administration
Implementation Schedule:	Within 12 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

Wichita County-wide – Action #2	
Proposed Action:	Upgrade critical facilities to include drought mitigation measures such as greywater reuse systems, and drought tolerant landscaping.
BACKGROUND INFORMATION	
Site and Location:	Community-wide critical facilities including all participating jurisdictions
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce impact on ground water and/or water consumption. Reduce water requirements for landscaping.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structures and infrastructures
Priority (High, Moderate, Low):	High
Estimated Cost:	\$100,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	County Public Works/City Engineer/City Administrator
Implementation Schedule:	Ongoing
Incorporation into Existing Plans:	Local Plans and Ordinances

COMMENTS:

SECTION 18: MITIGATION ACTIONS

Wichita County-wide – Action #3	
Proposed Action:	Acquire and install generators with hard-wired quick connections at all critical facilities.
BACKGROUND INFORMATION	
Site and Location:	County-wide and community-wide critical facilities
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Provide power for critical facilities during power outages and ensure continuity of critical services.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure (where applicable), Extreme Heat, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Energy (Power/Fuel)
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$1,000,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	County Public Works/City Engineer/City Administrator
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Helps ensure critical facilities continue to provide services during a power outage caused by unforeseen events.

SECTION 18: MITIGATION ACTIONS

Wichita County-wide – Action #4	
Proposed Action:	Harden/retrofit critical facilities to hazard-resistant levels.
BACKGROUND INFORMATION	
Site and Location:	County-wide and community-wide critical facilities
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce damages at critical facilities; Ensure continuity of critical services during and after event; Reduce risk of injury to emergency and critical personnel.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure (where applicable), Extreme Heat, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	\$1,000,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	County Public Works/City Engineer/City Administrator
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan; Capital Improvement Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 18: MITIGATION ACTIONS

Wichita County-wide – Action #5	
Proposed Action:	Develop a Community Wildfire Protection Plan (CWPP).
BACKGROUND INFORMATION	
Site and Location:	County-wide including all participating jurisdictions
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk and spread of wildfires. Reduce risk of damages, and injuries.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$100,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	County and Local Emergency Managers / Administration, County/Local Fire Department/VFD
Implementation Schedule:	Within 12-36 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:

SECTION 18: MITIGATION ACTIONS

WICHITA COUNTY

Wichita County – Action #1	
Proposed Action:	Drainage improvement project: Cleaning and widening of Gilbert Creek.
BACKGROUND INFORMATION	
Site and Location:	Gilbert Creek – rural area near Burkburnett
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce flood risk through improved drainage capacity; Reduce risk of damages and injuries; Reduce emergency response demands.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Natural Systems Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	\$1,000,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Wichita County and OEM
Implementation Schedule:	Within 12-36 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Hazard Mitigation Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

SECTION 18: MITIGATION ACTIONS

Wichita County – Action #2		
	Proposed Action:	Acquire and install generators with hard-wired quick connections at all critical facilities.
	BACKGROUND INFORMATION	
	Site and Location:	County-wide critical facilities
	Risk Reduction Benefit: (Current Cost/Losses Avoided)	Provide power for critical facilities during power outages and ensure continuity of critical services.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Earthquake, Extreme Heat, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Energy (Power/Fuel)
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$500,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	Within 60 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Emergency Operations Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Helps ensure critical facilities continue to provide services during a power outage caused by unforeseen events.

SECTION 18: MITIGATION ACTIONS

Wichita County – Action #3	
Proposed Action:	Harden/retrofit critical facilities to hazard-resistant levels.
BACKGROUND INFORMATION	
Site and Location:	County-wide critical facilities
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce damages at critical facilities; Ensure continuity of critical services during and after event; Reduce risk of injury to emergency and critical personnel.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Earthquake, Extreme Heat, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	\$2,500,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	Within 60 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Hazard Mitigation Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 18: MITIGATION ACTIONS

Wichita County – Action #4	
Proposed Action:	Planning, Design and Construction of Water Resources Projects, Encourage Water Conservation and Conduct Public Education: Support planning, design and construction of water resources projects that would improve evaporation problems, increase water supply, and improve water storage and distribution systems. Continue on-going public awareness to implement water conservation initiatives.
BACKGROUND INFORMATION	
Site and Location:	Wichita County
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk to residents and vulnerable populations by providing alternative and adequate water supply.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Food/Water/Shelter
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$155 million
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	OEM and Public Works
Implementation Schedule:	Within 24-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Hazard Mitigation Plan

COMMENTS:

SECTION 18: MITIGATION ACTIONS

Wichita County – Action #5	
Proposed Action:	Chlorine Control Project in the Red River Basin: Treat water from Lake Kemp and Lake Diversion Reservoirs by improving water quality.
BACKGROUND INFORMATION	
Site and Location:	Lake Kemp and Lake Diversion Reservoirs
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk to residents and vulnerable populations.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Food/Water/Shelter
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$77.5 million
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: COE Tulsa District, Red River Authority; GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS; Texas State Soil and Water Conservation Board
Lead Agency/Department Responsible:	OEM and Public Works
Implementation Schedule:	Within 24-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Hazard Mitigation Plan

COMMENTS:
Chloride Concentrations in Lake Kemp and Lake Diversion range from 696 mg/l to 1,985 mg/l with concentration greater than 1,312 mg/l a total of 50 % of the time. Maximum chloride concentrations for drinking water are 250 mg/l, chloride levels usually average 20-60 mg/l.

SECTION 18: MITIGATION ACTIONS

Wichita County – Action #6	
Proposed Action:	Brush Control: Implement a process to maintain brush with the use of airborne spray techniques or other recommended measures.
BACKGROUND INFORMATION	
Site and Location:	County-wide focusing on high-risk areas within the WUI
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk of wildfires and the spread of wildfire through improved maintenance techniques.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Wildfire
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Food/Water/Shelter
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$77.5 million
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: Red River Authority; GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS; Texas State Soil and Water Conservation Board
Lead Agency/Department Responsible:	OEM and Public Works
Implementation Schedule:	Within 24-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Hazard Mitigation Plan

COMMENTS:

SECTION 18: MITIGATION ACTIONS

Wichita County – Action #7	
Proposed Action:	Water System Improvements in the Red River “B” Region: The primary strategy for reducing the flow of highly saline waters to the Red River is to impound these flows behind low flow dams and pump the saline water to off channel brine reservoirs where the water evaporates or is disposed of by deep well injection.
BACKGROUND INFORMATION	
Site and Location:	Red River B Region
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk and economic impacts to farmland by ensuring adequate water supply.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Food/Water/Shelter
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$63 million
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: Red River Authority; GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS; Texas State Soil and Water Conservation Board, Texas State Legislature Budget
Lead Agency/Department Responsible:	OEM and Wichita County Water Improvement District No. 2
Implementation Schedule:	Within 24-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Hazard Mitigation Plan

COMMENTS:
The Chloride Control project is included in the State Water Plan as one of the feasible strategies for meeting the water supply needed in Region B.

SECTION 18: MITIGATION ACTIONS

Wichita County – Action #8	
Proposed Action:	Tornado “Safe Room” Construction: Participate in the FEMA Individual “Safe Room” program by accepting applications from the citizens of Wichita County to have licensed NTSA or ATSA approved Safe Rooms installed in private residences.
BACKGROUND INFORMATION	
Site and Location:	County-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce damages to structures and infrastructure; Reduce risk of injuries or fatalities.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$3,000 per residence
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; FEMA HMGP
Lead Agency/Department Responsible:	Wichita County and OEM
Implementation Schedule:	Within 12-60 months of plan adoption, pending grant approval
Incorporation into Existing Plans:	Emergency Operations Plan

COMMENTS:
Grant application has been submitted.

SECTION 18: MITIGATION ACTIONS

Wichita County – Action #9	
Proposed Action:	Building Code Improvements: Each community will evaluate building code requirements and adopt improvements that will result in more hazard resistant structures. Communities that have adopted building codes should conduct annual code reviews and update codes as changes occur. At a minimum, national building codes should be followed with regionally standard code requirements such as including clips on framing members to strengthen structures and reduce damage from high winds.
BACKGROUND INFORMATION	
Site and Location:	Local participating jurisdictions
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce damages to structures and infrastructure; Reduce risk of injuries or fatalities.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Earthquake, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on New/Existing Buildings:	Reduces risk to new structures
Priority (High, Moderate, Low):	High
Estimated Cost:	\$5,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue
Lead Agency/Department Responsible:	Wichita County and NORTEX Regional Planning Commission
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	Local Codes / Ordinances

COMMENTS:
Coordination efforts with the NORTEX Regional Planning Commission as they may be the ideal agency to identify possible building code improvements, sponsor code workshops and assist communities with code enforcement.
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 18: MITIGATION ACTIONS

Wichita County – Action #10	
Proposed Action:	Improve Flood Warning: Identify sites where stream and electronic rain gauges are needed to expand the rainfall network rain gauges and provide active monitoring of the water rise.
BACKGROUND INFORMATION	
Site and Location:	County-wide high-risk flood areas
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promotes hazard awareness. Reduce risk of injuries to citizens; Reduce burden on emergency services during and after a flood event.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Communication
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$20,000 estimated cost to install automated rain gauge network; \$20,000 estimated installation cost to install each stream gauge; \$1,000 per month estimated maintenance cost (USGS Gauge)
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: Red River Authority; GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	OEM
Implementation Schedule:	Within 36 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Hazard Mitigation Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

Wichita County – Action #11	
Proposed Action:	Provide Training for County staff: Conduct a variety of training activities and workshops including but not limited to resources through EMA Region VI, NFIP Regional Office, TDEM, TCEQ, TWDB, TFMA, EMAT and ASFPM.
BACKGROUND INFORMATION	
Site and Location:	County-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promotes hazard awareness. Ensure appropriate response during and after a hazard event.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Drought, Extreme Heat, Earthquake, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$20,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Wichita County and NORTEX Regional Planning Commission
Implementation Schedule:	Within 12-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	N/A

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

Wichita County – Action #12	
Proposed Action:	Increase Emergency Management Staff.
BACKGROUND INFORMATION	
Site and Location:	County-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promotes hazard awareness. Ensure appropriate response during and after a hazard event.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Preparedness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Drought, Extreme Heat, Earthquake, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$55,000 initial equipment costs, \$100,000 per employee per year (estimated cost for salary, support, equipment, and benefits)
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TDEM; Federal Grants: FEMA HMA Grants, DOH
Lead Agency/Department Responsible:	Wichita County and OEM
Implementation Schedule:	Within 60 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	N/A

COMMENTS:
Wichita County and communities in the county have additional emergency operations responsibilities as a result of the Department of Homeland Security, the Federal Emergency Management Agency and the Texas Division of Emergency Management following the Disaster of 9–11 (2001) and the Disaster Mitigation Act of 2000.
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

Wichita County – Action #13	
Proposed Action:	Designate HAZMAT Cargo Routes in Wichita County: A Hazardous Materials Transportation Study was completed by the Texas A&M Transportation Institute. The study identified HAZMAT highway, railway and pipeline transportation routes through Wichita County. The goal is to designate and placard HAZMAT Routes in critical areas.
BACKGROUND INFORMATION	
Site and Location:	County-wide identified routes
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promotes hazard awareness. Ensure appropriate response during and after a hazard event.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Earthquake, Flood, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Transportation, Hazardous Materials
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$10,000 estimated cost to placard selected
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Wichita County, OEM, and LEPC
Implementation Schedule:	Within 24 months of plan adoption, or as funding becomes available; On-going signage maintenance
Incorporation into Existing Plans:	Emergency Operations Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

Wichita County – Action #14	
Proposed Action:	Acquire and install generators with hard-wired quick connections at all critical facilities.
BACKGROUND INFORMATION	
Site and Location:	Volunteer Fire Departments throughout the County
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Provide power for critical facilities during power outages and ensure continuity of critical services.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Earthquake, Extreme Heat, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Energy (Power/Fuel)
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$3,000 study cost; \$20,000 cost per fire station and/or critical facilities
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Wichita County and OEM
Implementation Schedule:	Within 60 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Emergency Operations Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Helps ensure critical facilities continue to provide services during a power outage caused by unforeseen events.

SECTION 18: MITIGATION ACTIONS

Wichita County – Action #15	
Proposed Action:	Distribution of Fans and HVAC Repairs: A joint effort by local power companies, volunteer organizations, Wichita County, and participating communities to solicit funds in an effort to purchase and distribute box fans and make air conditioner repairs.
BACKGROUND INFORMATION	
Site and Location:	County-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduces risk of injuries and fatalities to at risk populations during extreme weather events.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Extreme Heat
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Energy (Power/Fuel), Health/Medical
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$2,000 to purchase and distribute 100 box fans; \$3,000 estimated cost for a/c repairs
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; United Way, Rotary Clubs, Lions Clubs, American Red Cross, Churches and charitable organizations, power companies; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Wichita County and OEM
Implementation Schedule:	Within 24-36 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	N/A

COMMENTS:

SECTION 18: MITIGATION ACTIONS

Wichita County – Action #16	
Proposed Action:	Implement a tree trimming program that routinely clears tree limbs hanging in right-of-way: Identify and trim limbs clear tree limbs hanging in the rights-of-way to mitigate the loss of electricity from falling limbs.
BACKGROUND INFORMATION	
Site and Location:	County-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce damages to infrastructure; Ensure continuity of services during and after event; Reduce damages associated with power outages; Reduce risk of injuries or fatalities to vulnerable populations
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm Wind, Hail, Lightning, Tornado, Winter Storm, Wildfire
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Energy (Power/Fuel)
Effect on New/Existing Buildings:	Reduce risk to new and existing structures and infrastructures
Priority (High, Moderate, Low):	High
Estimated Cost:	\$3,000 – \$10,000 depending on growth
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; Utility companies; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Wichita County Precincts, Local road and grounds departments and local utility companies
Implementation Schedule:	Within 24-36 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Hazard Mitigation Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 18: MITIGATION ACTIONS

Wichita County – Action #17	
Proposed Action:	Install lightning rods on existing and future communication infrastructures and other critical facilities: Install and maintain lightning rods on existing and future communication and critical facilities operated.
BACKGROUND INFORMATION	
Site and Location:	County-wide critical facilities such as fire departments, police departments, public works, and city halls
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce damages to infrastructure; Ensure continuity of services during and after event; Reduce damages associated with power outages; Reduce risk of injuries or fatalities to vulnerable populations
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Lightning
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Energy (Power/Fuel)
Effect on New/Existing Buildings:	Reduce risk to new and existing structures and infrastructures
Priority (High, Moderate, Low):	High
Estimated Cost:	\$5,000 per facility
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; Utility companies; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	OEM
Implementation Schedule:	Within 12-60 months of plan adoption, pending grant approval
Incorporation into Existing Plans:	Emergency Operations Plan

COMMENTS:
Grant application has been submitted.

SECTION 18: MITIGATION ACTIONS

CITY OF BURKBURNETT

City of Burkburnett – Action #1	
Proposed Action:	Clean and improve storm runoff capabilities of Gilbert Creek throughout the city areas: Implement clearing of debris from bridges drains and culverts and stream restoration to ensure adequate drainage.
BACKGROUND INFORMATION	
Site and Location:	Multiple chock points along the creeks path throughout the city and north leading into the red river
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk of flood damages through improved drainage capacity/stormwater diversion; Reduce burden on emergency services during and after a flood event. Reduce damage to main roads into and out of the city.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Transportation
Effect on New/Existing Buildings:	Reduce risk to existing infrastructure
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$1,000,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Public works
Implementation Schedule:	Within 24-48 months of plan adoption
Incorporation into Existing Plans:	Stormwater Management Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

SECTION 18: MITIGATION ACTIONS

City of Burkburnett – Action #2	
Proposed Action:	Planning, Design and Construction of Water Resources Projects, Encourage Water Conservation and Conduct Public Education: Support planning, design and construction of water resources projects that would improve evaporation problems, increase water supply, and improve water storage and distribution systems. Continue on-going public awareness to implement water conservation initiatives.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk to residents and vulnerable populations by providing alternative and adequate water supply.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Food/Water/Shelter
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$155 million
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration and Public Works
Implementation Schedule:	Within 24-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	N/A

COMMENTS:

SECTION 18: MITIGATION ACTIONS

City of Burkburnett – Action #3	
Proposed Action:	Chlorine Control Project in the Red River Basin: Treat water from Lake Kemp and Lake Diversion Reservoirs by improving water quality.
BACKGROUND INFORMATION	
Site and Location:	Lake Kemp and Lake Diversion Reservoirs
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk to residents and vulnerable populations.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Food/Water/Shelter
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$77.5 million
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: COE Tulsa District, Red River Authority; GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS; Texas State Soil and Water Conservation Board
Lead Agency/Department Responsible:	Administration and Public Works
Implementation Schedule:	Within 24-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	N/A

COMMENTS:
Chloride Concentrations in Lake Kemp and Lake Diversion range from 696 mg/l to 1,985 mg/l with concentration greater than 1,312 mg/l a total of 50 % of the time. Maximum chloride concentrations for drinking water are 250 mg/l, chloride levels usually average 20-60 mg/l.

SECTION 18: MITIGATION ACTIONS

City of Burkburnett – Action #4	
Proposed Action:	Brush Control: Implement a process to maintain brush with the use of airborne spray techniques or other recommended measures.
BACKGROUND INFORMATION	
Site and Location:	Red River Basin Community-wide focusing on high-risk areas within the WUI
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk of wildfires and the spread of wildfire through improved maintenance techniques.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Wildfire
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Food/Water/Shelter
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$77.5 million
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: Red River Authority; GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS; Texas State Soil and Water Conservation Board
Lead Agency/Department Responsible:	Administration and Public Works
Implementation Schedule:	Within 24-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Local Plans / Ordinances

COMMENTS:

SECTION 18: MITIGATION ACTIONS

City of Burkburnett – Action #5	
Proposed Action:	Water System Improvements in the Red River “B” Region: The primary strategy for reducing the flow of highly saline waters to the Red River is to impound these flows behind low flow dams and pump the saline water to off channel brine reservoirs where the water evaporates or is disposed of by deep well injection.
BACKGROUND INFORMATION	
Site and Location:	Red River B Region
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk and economic impacts to farmland by ensuring adequate water supply.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Food/Water/Shelter
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$63 million
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: Red River Authority; GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS; Texas State Soil and Water Conservation Board, Texas State Legislature Budget
Lead Agency/Department Responsible:	Administration and Wichita County Water Improvement District No. 2
Implementation Schedule:	Within 24-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	N/A

COMMENTS:
The Chloride Control project is included in the State Water Plan as one of the feasible strategies for meeting the water supply needed in Region B.

SECTION 18: MITIGATION ACTIONS

City of Burkburnett – Action #6	
Proposed Action:	Tornado “Safe Room” Construction: Participate in the FEMA Individual “Safe Room” program by accepting applications from the citizens of Wichita County to have licensed NTSA or ATSA approved Safe Rooms installed in private residences
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce damages to structures and infrastructure; Reduce risk of injuries or fatalities.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$3,000 per residence
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; FEMA HMGP
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 12-60 months of plan adoption, pending grant approval
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
Grant application has been submitted by county.

SECTION 18: MITIGATION ACTIONS

City of Burkburnett – Action #7	
Proposed Action:	Building Code Improvements: Strengthen building codes by evaluating building code requirements and adopt improvements that will result in more hazard-resistant structures.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce damages to structures and infrastructure; Reduce risk of injuries or fatalities.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Earthquake, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on New/Existing Buildings:	Reduces risk to new structures
Priority (High, Moderate, Low):	High
Estimated Cost:	\$5,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue
Lead Agency/Department Responsible:	Administration, Wichita County and NORTEX Regional Planning Commission
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	Local Codes / Ordinances; Capital Improvement Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 18: MITIGATION ACTIONS

City of Burkburnett – Action #8	
Proposed Action:	Improve Flood Warning: Identify sites where stream and electronic rain gauges are needed to expand the rainfall network rain gauges and provide active monitoring of the water rise.
BACKGROUND INFORMATION	
Site and Location:	Community-wide high-risk flood areas
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promotes hazard awareness. Reduce risk of injuries to citizens; Reduce burden on emergency services during and after a flood event.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Communication
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$20,000 estimated cost to install automated rain gauge network; \$20,000 estimated installation cost to install each stream gauge; \$1,000 per month estimated maintenance cost (USGS Gauge)
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: Red River Authority; GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration and Public Works
Implementation Schedule:	Within 36 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Emergency Management Plan; Floodplain Ordinance

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Burkburnett – Action #9	
Proposed Action:	Provide Training for City staff: Conduct a variety of training activities and workshops including but not limited to resources through EMA Region VI, NFIP Regional Office, TDEM, TCEQ, TWDB, TFMA, EMAT and ASFPM.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promotes hazard awareness. Ensure appropriate response during and after a hazard event.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Earthquake, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$20,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration, Wichita County and NORTEX Regional Planning Commission
Implementation Schedule:	Within 12-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Burkburnett – Action #10	
Proposed Action:	Acquisition and Relocation or Elevation of Structures: Identify potential structures and initiate acquisition and relocation or elevation projects to reduce the risk of future flood losses. Create a database of Repetitive Loss Properties, properties that have had flood insurance claims, and properties located in areas of high flood risk.
BACKGROUND INFORMATION	
Site and Location:	Community-wide SRL and RL properties
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Eliminate risk of flood damages to high-risk structures and prevent future losses in high-risk flood hazard areas; Reduce risk of injuries to citizens; Reduce burden on emergency services during and after a flood event
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Natural Systems Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on New/Existing Buildings:	Reduces risk to existing structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$16.5, \$13,700,000 acquisition and relocation, \$2,740,000, \$2,740,000 demolition (ICC Funds)
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 12-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Floodplain Ordinance

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 18: MITIGATION ACTIONS

City of Burkburnett – Action #11	
Proposed Action:	Increase Emergency Management Staff.
BACKGROUND INFORMATION	
Site and Location:	County-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promotes hazard awareness. Ensure appropriate response during and after a hazard event.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Preparedness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Earthquake, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$55,000 initial equipment costs, \$100,000 per employee per year (estimated cost for salary, support, equipment, and benefits)
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TDEM; Federal Grants: FEMA HMA Grants, DOH
Lead Agency/Department Responsible:	Wichita County and OEM
Implementation Schedule:	Within 60 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
Wichita County and communities in the county have additional emergency operations responsibilities as a result of the Department of Homeland Security, the Federal Emergency Management Agency and the Texas Division of Emergency Management following the Disaster of 9–11 (2001) and the Disaster Mitigation Act of 2000.
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Burkburnett – Action #12	
Proposed Action:	Designate HAZMAT Cargo Routes in Wichita County: A Hazardous Materials Transportation Study was completed by the Texas A&M Transportation Institute. The study identified HAZMAT highway, railway, and pipeline transportation routes through Wichita County. The goal is to designate and placard HAZMAT Routes in critical areas.
BACKGROUND INFORMATION	
Site and Location:	County-wide identified routes
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promotes hazard awareness. Ensure appropriate response during and after a hazard event.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Earthquake, Flood, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Transportation, Hazardous Materials
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$10,000 estimated cost to placard selected
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Wichita County, OEM, and LEPC
Implementation Schedule:	Within 24 months of plan adoption, or as funding becomes available; On-going signage maintenance
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Burkburnett – Action #13	
Proposed Action:	Distribution of Fans and HVAC Repairs: A joint effort by local power companies, volunteer organizations, Wichita County, and participating communities to solicit funds in an effort to purchase and distribute box fans and make air conditioner repairs.
BACKGROUND INFORMATION	
Site and Location:	County-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduces risk of injuries and fatalities to at risk populations during extreme weather events.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Extreme Heat
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Energy (Power/Fuel), Health/Medical
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$2,000 to purchase and distribute 100 box fans; \$3,000 estimated cost for a/c repairs
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; United Way, Rotary Clubs, Lions Clubs, American Red Cross, Churches and charitable organizations, power companies; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Wichita County and OEM
Implementation Schedule:	Within 24-36 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	N/A

COMMENTS:

SECTION 18: MITIGATION ACTIONS

City of Burkburnett – Action #14	
Proposed Action:	Implement a tree trimming program that routinely clears tree limbs hanging in right-of-way: Identify and trim limbs clear tree limbs hanging in the rights-of-way to mitigate the loss of electricity from falling limbs.
BACKGROUND INFORMATION	
Site and Location:	County-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce damages to infrastructure; Ensure continuity of services during and after event; Reduce damages associated with power outages; Reduce risk of injuries or fatalities to vulnerable populations
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm Wind, Hail, Lightning, Tornado, Winter Storm, Wildfire
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Energy (Power/Fuel)
Effect on New/Existing Buildings:	Reduce risk to new and existing structures and infrastructures
Priority (High, Moderate, Low):	High
Estimated Cost:	\$3,000 – \$10,000 depending on growth
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; Utility companies; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Wichita County Precincts, Local road and grounds departments and local utility companies
Implementation Schedule:	Within 24-36 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Local Plans / Ordinances

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 18: MITIGATION ACTIONS

City of Burkburnett – Action #15	
Proposed Action:	Install lightning rods on existing and future communication infrastructures and other critical facilities: Install and maintain lightning rods on existing and future communication and critical facilities operated.
BACKGROUND INFORMATION	
Site and Location:	County-wide critical facilities such as fire departments, police departments, public works, and city halls
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce damages to infrastructure; Ensure continuity of services during and after event; Reduce damages associated with power outages; Reduce risk of injuries or fatalities to vulnerable populations
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Lightning
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Energy (Power/Fuel)
Effect on New/Existing Buildings:	Reduce risk to new and existing structures and infrastructures
Priority (High, Moderate, Low):	High
Estimated Cost:	\$5,000 per facility
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; Utility companies; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	OEM
Implementation Schedule:	Within 12-60 months of plan adoption, pending grant approval
Incorporation into Existing Plans:	Emergency Management Plan; Capital Improvement Plan

COMMENTS:
Grant application has been submitted by county.

SECTION 18: MITIGATION ACTIONS

CITY OF CASHION COMMUNITY

City of Cashion Community – Action #1		
	Proposed Action:	Acquire and install generators with hard-wired quick connections at all critical facilities.
	BACKGROUND INFORMATION	
	Site and Location:	Community-wide critical facilities
	Risk Reduction Benefit: (Current Cost/Losses Avoided)	Provide power for critical facilities during power outages and ensure continuity of critical services.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Earthquake, Extreme Heat, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Energy (Power/Fuel)
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$500,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration and Wichita County OEM
Implementation Schedule:	Within 60 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Emergency Operations Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Helps ensure critical facilities continue to provide services during a power outage caused by unforeseen events.

SECTION 18: MITIGATION ACTIONS

City of Cashion Community – Action #2	
Proposed Action:	Harden/retrofit critical facilities to hazard-resistant levels.
BACKGROUND INFORMATION	
Site and Location:	Community-wide critical facilities
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce damages at critical facilities; Ensure continuity of critical services during and after event; Reduce risk of injury to emergency and critical personnel.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Earthquake, Extreme Heat, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	\$2,500,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration and Wichita County OEM
Implementation Schedule:	Within 60 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	N/A

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 18: MITIGATION ACTIONS

City of Cashion Community– Action #3	
Proposed Action:	Launch a Turn Around Don't Drown (TADD) Campaign: Initiate public education on program by posting TADD information and icons on community web pages and distribution of bumper stickers, etc. Construct barricades that can be placed at low-water crossings during flooding conditions.
BACKGROUND INFORMATION	
Site and Location:	Community-wide low-water crossings
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk of injuries, fatalities and damages through education and awareness.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$10,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Cashion Community– Action #4	
Proposed Action:	Planning, Design and Construction of Water Resources Projects, Encourage Water Conservation and Conduct Public Education: Support planning, design and construction of water resources projects that would improve evaporation problems, increase water supply, and improve water storage and distribution systems. Continue on-going public awareness to implement water conservation initiatives.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk to residents and vulnerable populations by providing alternative and adequate water supply.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Food/Water/Shelter
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$155 million
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration and Wichita County OEM
Implementation Schedule:	Within 24-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	N/A

COMMENTS:

SECTION 18: MITIGATION ACTIONS

City of Cashion Community– Action #5	
Proposed Action:	Chlorine Control Project in the Red River Basin: Treat water from Lake Kemp and Lake Diversion Reservoirs by improving water quality.
BACKGROUND INFORMATION	
Site and Location:	Lake Kemp and Lake Diversion Reservoirs
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk to residents and vulnerable populations.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Food/Water/Shelter
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$77.5 million
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: COE Tulsa District, Red River Authority; GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS; Texas State Soil and Water Conservation Board
Lead Agency/Department Responsible:	Administration and Wichita County OEM
Implementation Schedule:	Within 24-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	N/A

COMMENTS:
Chloride Concentrations in Lake Kemp and Lake Diversion range from 696 mg/l to 1,985 mg/l with concentration greater than 1,312 mg/l a total of 50 % of the time. Maximum chloride concentrations for drinking water are 250 mg/l, chloride levels usually average 20-60 mg/l.

SECTION 18: MITIGATION ACTIONS

City of Cashion Community– Action #6	
Proposed Action:	Brush Control: Implement a process to maintain brush with the use of airborne spray techniques or other recommended measures.
BACKGROUND INFORMATION	
Site and Location:	Red River Basin Community-wide focusing on high-risk areas within the WUI
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk of wildfires and the spread of wildfire through improved maintenance techniques.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Wildfire
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Food/Water/Shelter
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$77.5 million
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: Red River Authority; GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS; Texas State Soil and Water Conservation Board
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 24-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Local Plans / Ordinances

COMMENTS:

SECTION 18: MITIGATION ACTIONS

City of Cashion Community– Action #7	
Proposed Action:	Water System Improvements in the Red River “B” Region: The primary strategy for reducing the flow of highly saline waters to the Red River is to impound these flows behind low flow dams and pump the saline water to off channel brine reservoirs where the water evaporates or is disposed of by deep well injection.
BACKGROUND INFORMATION	
Site and Location:	Red River B Region
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk and economic impacts to farmland by ensuring adequate water supply.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Food/Water/Shelter
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$63 million
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: Red River Authority; GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS; Texas State Soil and Water Conservation Board, Texas State Legislature Budget
Lead Agency/Department Responsible:	Administration, Wichita County OEM, and Wichita County Water Improvement District No. 2
Implementation Schedule:	Within 24-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	N/A

COMMENTS:
The Chloride Control project is included in the State Water Plan as one of the feasible strategies for meeting the water supply needed in Region B.

SECTION 18: MITIGATION ACTIONS

City of Cashion Community– Action #8	
Proposed Action:	Implement education and awareness programs utilizing media, social media, bulletins, flyers, etc. and sponsoring “Safe Room” workshops for communities, interested homeowners, design professionals and contractors. Invite recognized experts such as Texas Tech University Wind Science and Engineering Research Center, FEMA, TDEM, and others to provide technical and funding information throughout Wichita County.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promote hazard awareness and protect citizens from potential injuries and damages.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$15,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 12 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:

SECTION 18: MITIGATION ACTIONS

City of Cashion Community– Action #9	
Proposed Action:	Tornado “Safe Room” Construction: Participate in the FEMA Individual “Safe Room” program by accepting applications from the citizens of Wichita County to have licensed NTSA or ATSA approved Safe Rooms installed in private residences
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce damages to structures and infrastructure; Reduce risk of injuries or fatalities.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$3,000 per residence
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; FEMA HMGP
Lead Agency/Department Responsible:	Administration and Wichita County OEM
Implementation Schedule:	Within 12-60 months of plan adoption, pending grant approval
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
Grant application has been submitted by county.

SECTION 18: MITIGATION ACTIONS

City of Cashion Community– Action #10	
Proposed Action:	Building Code Improvements: Strengthen building codes by evaluating building code requirements and adopt improvements that will result in more hazard-resistant structures.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce damages to structures and infrastructure; Reduce risk of injuries or fatalities.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Earthquake, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on New/Existing Buildings:	Reduces risk to new structures
Priority (High, Moderate, Low):	High
Estimated Cost:	\$5,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue
Lead Agency/Department Responsible:	Administration, Wichita County OEM and NORTEX Regional Planning Commission
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	Local Codes / Ordinances

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 18: MITIGATION ACTIONS

City of Cashion Community– Action #11	
Proposed Action:	Join the National Flood Insurance Program (NFIP).
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Provide access to flood insurance for local residents; Reduce flood risk and build resiliency.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	Reduce risk to new and existing structures and infrastructure
Priority (High, Moderate, Low):	High
Estimated Cost:	\$5,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue
Lead Agency/Department Responsible:	Administration / Floodplain Administrator
Implementation Schedule:	Within 12 months of plan adoption
Incorporation into Existing Plans:	Local Codes / Ordinances

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 18: MITIGATION ACTIONS

City of Cashion Community– Action #12	
Proposed Action:	Undertake an initiative to increase the number of flood insurance policies.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce flood risk and build resiliency; Increase flood risk awareness; Reduce damage impact on residents after a flood event; Reduce the burden on state and federal resources.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	Reduce risk to new and existing structures and infrastructure
Priority (High, Moderate, Low):	High
Estimated Cost:	\$5,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue
Lead Agency/Department Responsible:	Administration / Floodplain Administrator
Implementation Schedule:	Within 12 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

SECTION 18: MITIGATION ACTIONS

City of Cashion Community– Action #13	
Proposed Action:	Improve Flood Warning: Identify sites where stream and electronic rain gauges are needed to expand the rainfall network rain gauges and provide active monitoring of the water rise.
BACKGROUND INFORMATION	
Site and Location:	Community-wide high-risk flood areas
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promotes hazard awareness. Reduce risk of injuries to citizens; Reduce burden on emergency services during and after a flood event.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Communication
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$20,000 estimated cost to install automated rain gauge network; \$20,000 estimated installation cost to install each stream gauge; \$1,000 per month estimated maintenance cost (USGS Gauge)
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 36 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Emergency Management Plan; Floodplain Ordinance

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Cashion Community– Action #14	
Proposed Action:	Identify and conduct flood risk analysis on high-risk areas: Conduct analysis on identified high risk areas. Coordinate with federal and state agencies and to initiate projects to reduce flood risk.
BACKGROUND INFORMATION	
Site and Location:	Community-wide high-risk flood areas and dam inundation areas
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Improve risk assessment; Reduce risk of damages or injuries.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication, Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures and infrastructure
Priority (High, Moderate, Low):	High
Estimated Cost:	\$20,000 to \$60,000 estimated cost per analysis
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: Red River Authority; GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 12-36 months of plan adoption
Incorporation into Existing Plans:	Floodplain Ordinance

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

SECTION 18: MITIGATION ACTIONS

City of Cashion Community– Action #15	
Proposed Action:	Provide Training for City staff: Conduct a variety of training activities and workshops including but not limited to resources through EMA Region VI, NFIP Regional Office, TDEM, TCEQ, TWDB, TFMA, EMAT and ASFPM.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promotes hazard awareness. Ensure appropriate response during and after a hazard event.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Earthquake, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$20,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration, Wichita County OEM and NORTEX Regional Planning Commission
Implementation Schedule:	Within 12-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Cashion Community– Action #16	
Proposed Action:	Acquisition and Relocation or Elevation of Structures: Identify potential structures and initiate acquisition and relocation or elevation projects to reduce the risk of future flood losses. Create a database of Repetitive Loss Properties, properties that have had flood insurance claims, and properties located in areas of high flood risk.
BACKGROUND INFORMATION	
Site and Location:	Community-wide SRL and RL properties
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Eliminate risk of flood damages to high-risk structures and prevent future losses in high-risk flood hazard areas; Reduce risk of injuries to citizens; Reduce burden on emergency services during and after a flood event
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Natural Systems Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on New/Existing Buildings:	Reduces risk to existing structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$16.5, \$13,700,000 acquisition and relocation, \$2,740,000, \$2,740,000 demolition (ICC Funds)
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 12-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Floodplain Ordinance

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 18: MITIGATION ACTIONS

City of Cashion Community– Action #17	
Proposed Action:	Increase Emergency Management Staff.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promotes hazard awareness. Ensure appropriate response during and after a hazard event.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Preparedness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Earthquake, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$55,000 initial equipment costs, \$100,000 per employee per year (estimated cost for salary, support, equipment, and benefits)
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TDEM; Federal Grants: FEMA HMA Grants, DOH
Lead Agency/Department Responsible:	Administration and Wichita County OEM
Implementation Schedule:	Within 60 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	N/A

COMMENTS:
Wichita County and communities in the county have additional emergency operations responsibilities as a result of the Department of Homeland Security, the Federal Emergency Management Agency and the Texas Division of Emergency Management following the Disaster of 9–11 (2001) and the Disaster Mitigation Act of 2000.
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Cashion Community– Action #18	
Proposed Action:	Obtain certification in the National Weather Service StormReady Program.
BACKGROUND INFORMATION	
Site and Location:	Community-wide critical facilities
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk to citizens by educating the public on how to prepare for hazards and disasters.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hail, Thunderstorm Wind, Tornado, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$10,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 24 months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Cashion Community– Action #19	
Proposed Action:	Designate HAZMAT Cargo Routes in Wichita County: A Hazardous Materials Transportation Study was completed by the Texas A&M Transportation Institute. The study identified HAZMAT highway, railway and pipeline transportation routes through Wichita County. The goal is to designate and placard HAZMAT Routes in critical areas.
BACKGROUND INFORMATION	
Site and Location:	Community-wide identified routes
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promotes hazard awareness. Ensure appropriate response during and after a hazard event.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Earthquake, Flood, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Transportation, Hazardous Materials
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$10,000 estimated cost to placard selected
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration, Wichita County OEM, and LEPC
Implementation Schedule:	Within 24 months of plan adoption, or as funding becomes available; On-going signage maintenance
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Cashion Community– Action #20	
Proposed Action:	Acquire and install generators with hard-wired quick connections at all critical facilities.
BACKGROUND INFORMATION	
Site and Location:	Local Volunteer Fire Department
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Provide power for critical facilities during power outages and ensure continuity of critical services.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Earthquake, Extreme Heat, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Energy (Power/Fuel)
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$3,000 study cost; \$20,000 cost per fire station and/or critical facilities
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 60 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Helps ensure critical facilities continue to provide services during a power outage caused by unforeseen events.

SECTION 18: MITIGATION ACTIONS

City of Cashion Community– Action #21	
Proposed Action:	Implement education and awareness programs utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promote hazard awareness and protect citizens from potential injuries and damages.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Earthquake, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$5,000
Potential Funding Sources:	Local Funds (staff time), State and Federal Grants
Lead Agency/Department Responsible:	Administration and Local Fire Department
Implementation Schedule:	Within 12 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Cashion Community– Action #22	
Proposed Action:	Reduce Impacts on Elderly and Low-Income Persons: Public notification effort during extreme heat periods urging elderly and low-income persons to seek help if needed. Cooling stations will be in all of the participating communities in their public libraries or if unavailable, the libraries of neighboring jurisdictions.
BACKGROUND INFORMATION	
Site and Location:	Community-wide when maximum temperature in excess of 100 degrees that occurs on two or more consecutive days
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promote hazard awareness and protect citizens from potential injuries and damages.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Extreme Heat
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$5,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue
Lead Agency/Department Responsible:	Administration and Wichita County OEM
Implementation Schedule:	Within 36 months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:

SECTION 18: MITIGATION ACTIONS

City of Cashion Community– Action #23	
Proposed Action:	Distribution of Fans and HVAC Repairs: A joint effort by local power companies, volunteer organizations, Wichita County, and participating communities to solicit funds in an effort to purchase and distribute box fans and make air conditioner repairs.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduces risk of injuries and fatalities to at risk populations during extreme weather events.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Extreme Heat
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Energy (Power/Fuel), Health/Medical
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$2,000 to purchase and distribute 100 box fans; \$3,000 estimated cost for a/c repairs
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; United Way, Rotary Clubs, Lions Clubs, American Red Cross, Churches and charitable organizations, power companies; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration and Wichita County OEM
Implementation Schedule:	Within 24-36 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	N/A

COMMENTS:

SECTION 18: MITIGATION ACTIONS

City of Cashion Community– Action #24	
Proposed Action:	Implement a tree trimming program that routinely clears tree limbs hanging in right-of-way: Identify and trim limbs clear tree limbs hanging in the rights-of-way to mitigate the loss of electricity from falling limbs.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce damages to infrastructure; Ensure continuity of services during and after event; Reduce damages associated with power outages; Reduce risk of injuries or fatalities to vulnerable populations
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm Wind, Hail, Lightning, Tornado, Winter Storm, Wildfire
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Energy (Power/Fuel)
Effect on New/Existing Buildings:	Reduce risk to new and existing structures and infrastructures
Priority (High, Moderate, Low):	High
Estimated Cost:	\$3,000 – \$10,000 depending on growth
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; Utility companies; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration, Local road and grounds departments and local utility companies
Implementation Schedule:	Within 24-36 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Local Plans / Ordinances

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 18: MITIGATION ACTIONS

City of Cashion Community– Action #25	
Proposed Action:	Install lightning rods on existing and future communication infrastructures and other critical facilities: Install and maintain lightning rods on existing and future communication and critical facilities operated.
BACKGROUND INFORMATION	
Site and Location:	Community-wide critical facilities such as fire departments, police departments, public works, and city halls
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce damages to infrastructure; Ensure continuity of services during and after event; Reduce damages associated with power outages; Reduce risk of injuries or fatalities to vulnerable populations
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Lightning
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Energy (Power/Fuel)
Effect on New/Existing Buildings:	Reduce risk to new and existing structures and infrastructures
Priority (High, Moderate, Low):	High
Estimated Cost:	\$5,000 per facility
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; Utility companies; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration and Wichita County OEM
Implementation Schedule:	Within 12-60 months of plan adoption, pending grant approval
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
Grant application has been submitted by county.

SECTION 18: MITIGATION ACTIONS

CITY OF ELECTA

City of Electra– Action #1	
Proposed Action:	Identify and establish Cooling Facilities. Once identified, provide public notification effort during extreme heat periods urging elderly and low-income persons to seek help if needed.
BACKGROUND INFORMATION	
Site and Location:	Public Library, Community Center, Senior Center, Fire Station.
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce impacts on Elderly and Low-Income Persons. Prevent loss of life and injury and improve information to the public
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Extreme Heat
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security; Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$500,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 12 months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:

SECTION 18: MITIGATION ACTIONS

City of Electra– Action #2	
Proposed Action:	Hydrologic and Hydraulic (H&H) Analyses of Earthen Dams: Contract with professional engineering firm to perform H&H Analyses of earthen dams and implement necessary mitigation actions.
BACKGROUND INFORMATION	
Site and Location:	Community-wide dams
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Prevent loss of life and injury and improve information to the public
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$25,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 24 months of plan adoption
Incorporation into Existing Plans:	Floodplain Ordinance

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

SECTION 18: MITIGATION ACTIONS

City of Electra– Action #3	
Proposed Action:	Launch a Turn Around Don't Drown (TADD) Campaign: Initiate public education on program by posting TADD information and icons on community web pages and distribution of bumper stickers, etc. Construct barricades that can be placed at low-water crossings during flooding conditions.
BACKGROUND INFORMATION	
Site and Location:	Community-wide low-water crossings
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk of injuries, fatalities and damages through education and awareness.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$10,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Electra– Action #4	
Proposed Action:	Planning, Design and Construction of Water Resources Projects, Encourage Water Conservation and Conduct Public Education: Support planning, design and construction of water resources projects that would improve evaporation problems, increase water supply, and improve water storage and distribution systems. Continue on-going public awareness to implement water conservation initiatives.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk to residents and vulnerable populations by providing alternative and adequate water supply.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Food/Water/Shelter
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$155 million
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration and Wichita County OEM
Implementation Schedule:	Within 24-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	N/A

COMMENTS:

SECTION 18: MITIGATION ACTIONS

City of Electra– Action #5	
Proposed Action:	Chlorine Control Project in the Red River Basin: Treat water from Lake Kemp and Lake Diversion Reservoirs by improving water quality.
BACKGROUND INFORMATION	
Site and Location:	Lake Kemp and Lake Diversion Reservoirs
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk to residents and vulnerable populations.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Food/Water/Shelter
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$77.5 million
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: COE Tulsa District, Red River Authority; GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS; Texas State Soil and Water Conservation Board
Lead Agency/Department Responsible:	Administration and Wichita County OEM
Implementation Schedule:	Within 24-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	N/A

COMMENTS:
Chloride Concentrations in Lake Kemp and Lake Diversion range from 696 mg/l to 1,985 mg/l with concentration greater than 1,312 mg/l a total of 50 % of the time. Maximum chloride concentrations for drinking water are 250 mg/l, chloride levels usually average 20-60 mg/l.

SECTION 18: MITIGATION ACTIONS

City of Electra– Action #6	
Proposed Action:	Brush Control: Implement a process to maintain brush with the use of airborne spray techniques or other recommended measures.
BACKGROUND INFORMATION	
Site and Location:	Red River Basin Community-wide focusing on high-risk areas within the WUI
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk of wildfires and the spread of wildfire through improved maintenance techniques.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Wildfire
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Food/Water/Shelter
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$77.5 million
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: Red River Authority; GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS; Texas State Soil and Water Conservation Board
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 24-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Local Plans / Ordinances

COMMENTS:

SECTION 18: MITIGATION ACTIONS

City of Electra– Action #7	
Proposed Action:	Water System Improvements in the Red River “B” Region: The primary strategy for reducing the flow of highly saline waters to the Red River is to impound these flows behind low flow dams and pump the saline water to off channel brine reservoirs where the water evaporates or is disposed of by deep well injection.
BACKGROUND INFORMATION	
Site and Location:	Red River B Region
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk and economic impacts to farmland by ensuring adequate water supply.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Food/Water/Shelter
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$63 million
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: Red River Authority; GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS; Texas State Soil and Water Conservation Board, Texas State Legislature Budget
Lead Agency/Department Responsible:	Administration, Wichita County OEM, and Wichita County Water Improvement District No. 2
Implementation Schedule:	Within 24-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	N/A

COMMENTS:
The Chloride Control project is included in the State Water Plan as one of the feasible strategies for meeting the water supply needed in Region B.

SECTION 18: MITIGATION ACTIONS

City of Electra– Action #8	
Proposed Action:	Implement education and awareness programs utilizing media, social media, bulletins, flyers, etc. and sponsoring “Safe Room” workshops for communities, interested homeowners, design professionals and contractors. Invite recognized experts such as Texas Tech University Wind Science and Engineering Research Center, FEMA, TDEM, and others to provide technical and funding information throughout Wichita County.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promote hazard awareness and protect citizens from potential injuries and damages.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$15,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 12 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:

SECTION 18: MITIGATION ACTIONS

City of Electra– Action #9	
Proposed Action:	Tornado “Safe Room” Construction: Participate in the FEMA Individual “Safe Room” program by accepting applications from the citizens of Wichita County to have licensed NTSA or ATSA approved Safe Rooms installed in private residences
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce damages to structures and infrastructure; Reduce risk of injuries or fatalities.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$3,000 per residence
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; FEMA HMGP
Lead Agency/Department Responsible:	Administration and Wichita County OEM
Implementation Schedule:	Within 12-60 months of plan adoption, pending grant approval
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
Grant application has been submitted by county.

SECTION 18: MITIGATION ACTIONS

City of Electra– Action #10	
Proposed Action:	Building Code Improvements: Strengthen building codes by evaluating building code requirements and adopt improvements that will result in more hazard-resistant structures.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce damages to structures and infrastructure; Reduce risk of injuries or fatalities.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Earthquake, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on New/Existing Buildings:	Reduces risk to new structures
Priority (High, Moderate, Low):	High
Estimated Cost:	\$5,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue
Lead Agency/Department Responsible:	Administration, Wichita County OEM and NORTEX Regional Planning Commission
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	Local Codes / Ordinances

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 18: MITIGATION ACTIONS

City of Electra– Action #11	
Proposed Action:	Join the National Flood Insurance Program (NFIP).
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Provide access to flood insurance for local residents; Reduce flood risk and build resiliency.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	Reduce risk to new and existing structures and infrastructure
Priority (High, Moderate, Low):	High
Estimated Cost:	\$5,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue
Lead Agency/Department Responsible:	Administration / Floodplain Administrator
Implementation Schedule:	Within 12 months of plan adoption
Incorporation into Existing Plans:	Local Codes / Ordinances

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 18: MITIGATION ACTIONS

City of Electra– Action #12	
Proposed Action:	Undertake an initiative to increase the number of flood insurance policies.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce flood risk and build resiliency; Increase flood risk awareness; Reduce damage impact on residents after a flood event; Reduce the burden on state and federal resources.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	Reduce risk to new and existing structures and infrastructure
Priority (High, Moderate, Low):	High
Estimated Cost:	\$5,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue
Lead Agency/Department Responsible:	Administration / Floodplain Administrator
Implementation Schedule:	Within 12 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

SECTION 18: MITIGATION ACTIONS

City of Electra– Action #13	
Proposed Action:	Improve Flood Warning: Identify sites where stream and electronic rain gauges are needed to expand the rainfall network rain gauges and provide active monitoring of the water rise.
BACKGROUND INFORMATION	
Site and Location:	Community-wide high-risk flood areas
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promotes hazard awareness. Reduce risk of injuries to citizens; Reduce burden on emergency services during and after a flood event.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Communication
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$20,000 estimated cost to install automated rain gauge network; \$20,000 estimated installation cost to install each stream gauge; \$1,000 per month estimated maintenance cost (USGS Gauge)
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 36 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Emergency Management Plan; Floodplain Ordinance

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Electra– Action #14	
Proposed Action:	Identify and conduct flood risk analysis on high-risk areas: Conduct analysis on identified high risk areas. Coordinate with Federal and state agencies and to initiate projects to reduce flood risk.
BACKGROUND INFORMATION	
Site and Location:	Community-wide high-risk flood areas and dam inundation areas
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Improve risk assessment; Reduce risk of damages or injuries
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication, Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures and infrastructure
Priority (High, Moderate, Low):	High
Estimated Cost:	\$20,000 to \$60,000 estimated cost per analysis
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: Red River Authority; GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 12-36 months of plan adoption
Incorporation into Existing Plans:	Floodplain Ordinance

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

SECTION 18: MITIGATION ACTIONS

City of Electra– Action #15	
Proposed Action:	Provide Training for City staff: Conduct a variety of training activities and workshops including but not limited to resources through EMA Region VI, NFIP Regional Office, TDEM, TCEQ, TWDB, TFMA, EMAT and ASFPM.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promotes hazard awareness. Ensure appropriate response during and after a hazard event.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Earthquake, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$20,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration, Wichita County OEM and NORTEX Regional Planning Commission
Implementation Schedule:	Within 12-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Electra– Action #16	
Proposed Action:	Acquisition and Relocation or Elevation of Structures: Identify potential structures and initiate acquisition and relocation or elevation projects to reduce the risk of future flood losses. Create a database of Repetitive Loss Properties, properties that have had flood insurance claims, and properties located in areas of high flood risk.
BACKGROUND INFORMATION	
Site and Location:	Community-wide SRL and RL properties
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Eliminate risk of flood damages to high-risk structures and prevent future losses in high-risk flood hazard areas; Reduce risk of injuries to citizens; Reduce burden on emergency services during and after a flood event
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Natural Systems Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on New/Existing Buildings:	Reduces risk to existing structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$16.5, \$13,700,000 acquisition and relocation, \$2,740,000, \$2,740,000 demolition (ICC Funds)
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 12-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Floodplain Ordinance

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 18: MITIGATION ACTIONS

City of Electra– Action #17	
Proposed Action:	Increase Emergency Management Staff.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promotes hazard awareness. Ensure appropriate response during and after a hazard event.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Preparedness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Earthquake, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$55,000 initial equipment costs, \$100,000 per employee per year (estimated cost for salary, support, equipment, and benefits)
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TDEM; Federal Grants: FEMA HMA Grants, DOH
Lead Agency/Department Responsible:	Administration and Wichita County OEM
Implementation Schedule:	Within 60 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	N/A

COMMENTS:
Wichita County and communities in the county have additional emergency operations responsibilities as a result of the Department of Homeland Security, the Federal Emergency Management Agency and the Texas Division of Emergency Management following the Disaster of 9–11 (2001) and the Disaster Mitigation Act of 2000.
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Electra– Action #18	
Proposed Action:	Obtain certification in the National Weather Service StormReady Program.
BACKGROUND INFORMATION	
Site and Location:	Community-wide critical facilities
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk to citizens by educating the public on how to prepare for hazards and disasters.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hail, Thunderstorm Wind, Tornado, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$10,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 24 months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Electra– Action #19	
Proposed Action:	Designate HAZMAT Cargo Routes in Wichita County: A Hazardous Materials Transportation Study was completed by the Texas A&M Transportation Institute. The study identified HAZMAT highway, railway and pipeline transportation routes through Wichita County. The goal is to designate and placard HAZMAT Routes in critical areas.
BACKGROUND INFORMATION	
Site and Location:	Community-wide identified routes
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promotes hazard awareness. Ensure appropriate response during and after a hazard event.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Earthquake, Flood, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Transportation, Hazardous Materials
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$10,000 estimated cost to placard selected
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration, Wichita County OEM, and LEPC
Implementation Schedule:	Within 24 months of plan adoption, or as funding becomes available; On-going signage maintenance
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Electra– Action #20	
Proposed Action:	Acquire and install generators with hard-wired quick connections at all critical facilities.
BACKGROUND INFORMATION	
Site and Location:	Local Volunteer Fire Department
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Provide power for critical facilities during power outages and ensure continuity of critical services.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Earthquake, Extreme Heat, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Energy (Power/Fuel)
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$3,000 study cost; \$20,000 cost per fire station and/or critical facilities
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 60 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Helps ensure critical facilities continue to provide services during a power outage caused by unforeseen events.

SECTION 18: MITIGATION ACTIONS

City of Electra– Action #21	
Proposed Action:	Implement education and awareness programs utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promote hazard awareness and protect citizens from potential injuries and damages.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Earthquake, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$5,000
Potential Funding Sources:	Local Funds (staff time), State and Federal Grants
Lead Agency/Department Responsible:	Administration and Local Fire Department
Implementation Schedule:	Within 12 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Electra– Action #22	
Proposed Action:	Reduce Impacts on Elderly and Low-Income Persons: Public notification effort during extreme heat periods urging elderly and low-income persons to seek help if needed. Cooling stations will be in all of the participating communities in their public libraries or if unavailable, the libraries of neighboring jurisdictions.
BACKGROUND INFORMATION	
Site and Location:	Community-wide when maximum temperature in excess of 100 degrees that occurs on two or more consecutive days
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promote hazard awareness and protect citizens from potential injuries and damages.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Extreme Heat
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$5,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue
Lead Agency/Department Responsible:	Administration and Wichita County OEM
Implementation Schedule:	Within 36 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:

SECTION 18: MITIGATION ACTIONS

City of Electra– Action #23	
Proposed Action:	Distribution of Fans and HVAC Repairs: A joint effort by local power companies, volunteer organizations, Wichita County, and participating communities to solicit funds in an effort to purchase and distribute box fans and make air conditioner repairs.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduces risk of injuries and fatalities to at risk populations during extreme weather events.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Extreme Heat
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Energy (Power/Fuel), Health/Medical
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$2,000 to purchase and distribute 100 box fans; \$3,000 estimated cost for a/c repairs
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; United Way, Rotary Clubs, Lions Clubs, American Red Cross, Churches and charitable organizations, power companies; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration and Wichita County OEM
Implementation Schedule:	Within 24-36 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	N/A

COMMENTS:

SECTION 18: MITIGATION ACTIONS

City of Electra– Action #24	
Proposed Action:	Implement a tree trimming program that routinely clears tree limbs hanging in right-of-way: Identify and trim limbs clear tree limbs hanging in the rights-of-way to mitigate the loss of electricity from falling limbs.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce damages to infrastructure; Ensure continuity of services during and after event; Reduce damages associated with power outages; Reduce risk of injuries or fatalities to vulnerable populations
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm Wind, Hail, Lightning, Tornado, Winter Storm, Wildfire
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Energy (Power/Fuel)
Effect on New/Existing Buildings:	Reduce risk to new and existing structures and infrastructures
Priority (High, Moderate, Low):	High
Estimated Cost:	\$25,000 annually
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue
Lead Agency/Department Responsible:	Administration, local road and grounds departments and local utility companies
Implementation Schedule:	Annually
Incorporation into Existing Plans:	Local Plans / Ordinances

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 18: MITIGATION ACTIONS

City of Electra– Action #25	
Proposed Action:	Install lightning rods on existing and future communication infrastructures and other critical facilities: Install and maintain lightning rods on existing and future communication and critical facilities operated.
BACKGROUND INFORMATION	
Site and Location:	Community-wide critical facilities such as fire departments, police departments, public works, and city halls
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce damages to infrastructure; Ensure continuity of services during and after event; Reduce damages associated with power outages; Reduce risk of injuries or fatalities to vulnerable populations
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Lightning
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Energy (Power/Fuel)
Effect on New/Existing Buildings:	Reduce risk to new and existing structures and infrastructures
Priority (High, Moderate, Low):	High
Estimated Cost:	\$5,000 per facility
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; Utility companies; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration and Wichita County OEM
Implementation Schedule:	Within 12-60 months of plan adoption, pending grant approval
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
Grant application has been submitted by county.

SECTION 18: MITIGATION ACTIONS

CITY OF IOWA PARK

City of Iowa Park – Action #1	
Proposed Action:	Hydrologic and Hydraulic (H&H) Analyses of Earthen Dams and high-risk flood areas: Continue on-going analysis and implement necessary improvements. Develop maintenance orders and update EOPs.
BACKGROUND INFORMATION	
Site and Location:	North Fork Buffalo Creek Reservoir Dam, the Lake Iowa Park Dam, and the Gordon Lake Dam
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Prevent loss of life and injury and improve information to the public
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$1,000,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Ongoing and as funding becomes available to implement necessary improvements
Incorporation into Existing Plans:	North Fork Buffalo Creek Reservoir Dam EOP; Lake Iowa Park Dam EOP; Gordon Lake Dam EOP

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities from flooding.

SECTION 18: MITIGATION ACTIONS

City of Iowa Park – Action #2	
Proposed Action:	Launch a Turn Around Don't Drown (TADD) Campaign: Continue to analyze and position barricades at low-water crossings throughout community. Develop maintenance orders.
BACKGROUND INFORMATION	
Site and Location:	Community-wide low-water crossings
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk of injuries, fatalities and damages through education and awareness.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$10,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Iowa Park – Action #3	
Proposed Action:	Planning, Design and Construction of Water Resources Projects, Encourage Water Conservation and Conduct Public Education: Support planning, design and construction of water resources projects that would improve evaporation problems, increase water supply, and improve water storage and distribution systems. Continue on-going public awareness to implement water conservation initiatives.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk to residents and vulnerable populations by providing alternative and adequate water supply.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Food/Water/Shelter
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$155 million
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration and Wichita County OEM
Implementation Schedule:	On-going
Incorporation into Existing Plans:	N/A

COMMENTS:

SECTION 18: MITIGATION ACTIONS

City of Iowa Park – Action #4	
Proposed Action:	Undertake an initiative to increase the number of flood insurance policies.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce flood risk and build resiliency; Increase flood risk awareness; Reduce damage impact on residents after a flood event; Reduce the burden on state and federal resources.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	Reduce risk to new and existing structures and infrastructure
Priority (High, Moderate, Low):	High
Estimated Cost:	\$5,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue
Lead Agency/Department Responsible:	Administration / Floodplain Administrator
Implementation Schedule:	On-going
Incorporation into Existing Plans:	Floodplain Ordinance

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

SECTION 18: MITIGATION ACTIONS

City of Iowa Park – Action #5	
Proposed Action:	Improve Flood Warning: Identify sites where stream and electronic rain gauges are needed to expand the rainfall network rain gauges and provide active monitoring of the water rise.
BACKGROUND INFORMATION	
Site and Location:	Community-wide high-risk flood areas
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promotes hazard awareness. Reduce risk of injuries to citizens; Reduce burden on emergency services during and after a flood event.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Communication
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$20,000 estimated cost to install automated rain gauge network; \$20,000 estimated installation cost to install each stream gauge; \$1,000 per month estimated maintenance cost (USGS Gauge)
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 36 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Emergency Management Plan; Floodplain Ordinance

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Iowa Park – Action #6	
Proposed Action:	Provide Training for City staff: Conduct a variety of training activities and workshops including but not limited to resources through EMA Region VI, NFIP Regional Office, TDEM, TCEQ, TWDB, TFMA, EMAT and ASFPM.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promotes hazard awareness. Ensure appropriate response during and after a hazard event.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Drought, Extreme Heat, Earthquake, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$20,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration, Wichita County OEM and NORTEX Regional Planning Commission
Implementation Schedule:	On-going
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Iowa Park – Action #7	
Proposed Action:	Increase Emergency Management Staff and ensure ICS and NIMS training are provided to current and future city personnel.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promotes hazard awareness. Ensure appropriate response during and after a hazard event.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Preparedness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Drought, Extreme Heat, Earthquake, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$55,000 initial equipment costs, \$100,000 per employee per year (estimated cost for salary, support, equipment, and benefits)
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TDEM; Federal Grants: FEMA HMA Grants, DOH
Lead Agency/Department Responsible:	Administration and Wichita County OEM
Implementation Schedule:	Within 24-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Iowa Park – Action #8	
Proposed Action:	Obtain certification in the National Weather Service StormReady Program.
BACKGROUND INFORMATION	
Site and Location:	Community-wide critical facilities
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk to citizens by educating the public on how to prepare for hazards and disasters.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hail, Thunderstorm Wind, Tornado, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$10,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 24 months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Iowa Park – Action #9	
Proposed Action:	Designate HAZMAT Cargo Routes in Wichita County: A Hazardous Materials Transportation Study was completed by the Texas A&M Transportation Institute. The study identified HAZMAT highway, railway and pipeline transportation routes through Wichita County. The goal is to designate and placard HAZMAT Routes in critical areas.
BACKGROUND INFORMATION	
Site and Location:	Community-wide identified routes
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promotes hazard awareness. Ensure appropriate response during and after a hazard event.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Earthquake, Flood, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Transportation, Hazardous Materials
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$10,000 estimated cost to placard selected
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration, Wichita County OEM, and LEPC
Implementation Schedule:	Within 24 months of plan adoption, or as funding becomes available; On-going signage maintenance
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Iowa Park – Action #10	
Proposed Action:	Acquire and install generators with hard-wired quick connections at all critical facilities.
BACKGROUND INFORMATION	
Site and Location:	Community-wide critical facilities Police Station and New Fire Station
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Provide power for critical facilities during power outages and ensure continuity of critical services.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Earthquake, Extreme Heat, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Energy (Power/Fuel)
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$3,000 study cost; \$20,000 cost per fire station and/or critical facilities
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 12-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Helps ensure critical facilities continue to provide services during a power outage caused by unforeseen events.

SECTION 18: MITIGATION ACTIONS

City of Iowa Park – Action #11	
Proposed Action:	Implement education and awareness programs utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promote hazard awareness and protect citizens from potential injuries and damages.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Drought, Extreme Heat, Earthquake, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$5,000
Potential Funding Sources:	Local Funds (staff time), State and Federal Grants
Lead Agency/Department Responsible:	Administration and Local Fire Department
Implementation Schedule:	Within 12 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Iowa Park – Action #12	
Proposed Action:	Distribution of Fans and HVAC Repairs: A joint effort by local power companies, volunteer organizations, Wichita County, and participating communities to solicit funds in an effort to purchase and distribute box fans and make air conditioner repairs.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduces risk of injuries and fatalities to at risk populations during extreme weather events.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Extreme Heat
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Energy, Health/Medical
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$2,000 to purchase and distribute 100 box fans; \$3,000 estimated cost for a/c repairs
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; United Way, Rotary Clubs, Lions Clubs, American Red Cross, Churches and charitable organizations, power companies; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration and Wichita County OEM
Implementation Schedule:	Within 24-36 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	N/A

COMMENTS:

SECTION 18: MITIGATION ACTIONS

City of Iowa Park – Action #13	
Proposed Action:	Implement a tree trimming program that routinely clears tree limbs hanging in right-of-way: Identify and trim limbs clear tree limbs hanging in the rights-of-way to mitigate the loss of electricity from falling limbs.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce damages to infrastructure; Ensure continuity of services during and after event; Reduce damages associated with power outages; Reduce risk of injuries or fatalities to vulnerable populations
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm Wind, Hail, Lightning, Tornado, Winter Storm, Wildfire
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Energy (Power/Fuel)
Effect on New/Existing Buildings:	Reduce risk to new and existing structures and infrastructures
Priority (High, Moderate, Low):	High
Estimated Cost:	\$3,000 – \$10,000 depending on growth
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; Utility companies; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration, local road and grounds departments and local utility companies
Implementation Schedule:	Within 24-36 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Local Plans / Ordinances

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 18: MITIGATION ACTIONS

City of Iowa Park – Action #14	
Proposed Action:	Install lightning rods on existing and future communication infrastructures and other critical facilities: Install and maintain lightning rods on existing and future communication and critical facilities operated.
BACKGROUND INFORMATION	
Site and Location:	Community-wide critical facilities such as fire departments, police departments, public works, and city halls
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce damages to infrastructure; Ensure continuity of services during and after event; Reduce damages associated with power outages; Reduce risk of injuries or fatalities to vulnerable populations
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Lightning
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Energy (Power/Fuel)
Effect on New/Existing Buildings:	Reduce risk to new and existing structures and infrastructures
Priority (High, Moderate, Low):	High
Estimated Cost:	\$5,000 per facility
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; Utility companies; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration and Wichita County OEM
Implementation Schedule:	Within 12-60 months of plan adoption, pending grant approval
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
Grant application has been submitted by county.

SECTION 18: MITIGATION ACTIONS

CITY OF PLEASANT VALLEY

City of Pleasant Valley – Action #1	
Proposed Action:	Hydrologic and Hydraulic (H&H) Analyses of high-risk flood areas: Contract with professional engineering firm to perform H&H Analyses and implement necessary mitigation actions.
BACKGROUND INFORMATION	
Site and Location:	Community-wide high-risk flood areas
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Prevent loss of life and injury and improve information to the public
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$25,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 24 months of plan adoption
Incorporation into Existing Plans:	Floodplain Ordinance

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

SECTION 18: MITIGATION ACTIONS

City of Pleasant Valley – Action #2	
Proposed Action:	Launch a Turn Around Don't Drown (TADD) Campaign: Initiate public education on program by posting TADD information and icons on community web pages and distribution of bumper stickers, etc. Construct barricades that can be placed at low-water crossings during flooding conditions.
BACKGROUND INFORMATION	
Site and Location:	Community-wide low-water crossings
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk of injuries, fatalities and damages through education and awareness.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$10,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Pleasant Valley – Action #3	
Proposed Action:	Planning, Design and Construction of Water Resources Projects, Encourage Water Conservation and Conduct Public Education: Support planning, design and construction of water resources projects that would improve evaporation problems, increase water supply, and improve water storage and distribution systems. Continue on-going public awareness to implement water conservation initiatives.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk to residents and vulnerable populations by providing alternative and adequate water supply.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Food/Water/Shelter
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$155 million
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration and Wichita County OEM
Implementation Schedule:	Within 24-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	N/A

COMMENTS:

SECTION 18: MITIGATION ACTIONS

City of Pleasant Valley – Action #4	
Proposed Action:	Chlorine Control Project in the Red River Basin: Treat water from Lake Kemp and Lake Diversion Reservoirs by improving water quality.
BACKGROUND INFORMATION	
Site and Location:	Lake Kemp and Lake Diversion Reservoirs
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk to residents and vulnerable populations.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Food/Water/Shelter
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$77.5 million
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: COE Tulsa District, Red River Authority; GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS; Texas State Soil and Water Conservation Board
Lead Agency/Department Responsible:	Administration and Wichita County OEM
Implementation Schedule:	Within 24-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	N/A

COMMENTS:
Chloride Concentrations in Lake Kemp and Lake Diversion range from 696 mg/l to 1,985 mg/l with concentration greater than 1,312 mg/l a total of 50 % of the time. Maximum chloride concentrations for drinking water are 250 mg/l, chloride levels usually average 20-60 mg/l.

SECTION 18: MITIGATION ACTIONS

City of Pleasant Valley – Action #5	
Proposed Action:	Brush Control: Implement a process to maintain brush with the use of airborne spray techniques or other recommended measures.
BACKGROUND INFORMATION	
Site and Location:	Red River Basin Community-wide focusing on high-risk areas within the WUI
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk of wildfires and the spread of wildfire through improved maintenance techniques.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Wildfire
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Food/Water/Shelter
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$77.5 million
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: Red River Authority; GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS; Texas State Soil and Water Conservation Board
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 24-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Local Plans / Ordinances

COMMENTS:

SECTION 18: MITIGATION ACTIONS

City of Pleasant Valley – Action #6	
Proposed Action:	Water System Improvements in the Red River “B” Region: The primary strategy for reducing the flow of highly saline waters to the Red River is to impound these flows behind low flow dams and pump the saline water to off channel brine reservoirs where the water evaporates or is disposed of by deep well injection.
BACKGROUND INFORMATION	
Site and Location:	Red River B Region
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk and economic impacts to farmland by ensuring adequate water supply.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Food/Water/Shelter
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$63 million
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: Red River Authority; GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS; Texas State Soil and Water Conservation Board, Texas State Legislature Budget
Lead Agency/Department Responsible:	Administration, Wichita County OEM, and Wichita County Water Improvement District No. 2
Implementation Schedule:	Within 24-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	N/A

COMMENTS:
The Chloride Control project is included in the State Water Plan as one of the feasible strategies for meeting the water supply needed in Region B.

SECTION 18: MITIGATION ACTIONS

City of Pleasant Valley – Action #7	
Proposed Action:	Implement education and awareness programs utilizing media, social media, bulletins, flyers, etc. and sponsoring “Safe Room” workshops for communities, interested homeowners, design professionals and contractors. Invite recognized experts such as Texas Tech University Wind Science and Engineering Research Center, FEMA, TDEM, and others to provide technical and funding information throughout Wichita County.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promote hazard awareness and protect citizens from potential injuries and damages.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$15,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 12 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:

SECTION 18: MITIGATION ACTIONS

City of Pleasant Valley – Action #8	
Proposed Action:	Tornado “Safe Room” Construction: Participate in the FEMA Individual “Safe Room” program by accepting applications from the citizens of Wichita County to have licensed NTSA or ATSA approved Safe Rooms installed in private residences
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce damages to structures and infrastructure; Reduce risk of injuries or fatalities.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$3,000 per residence
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; FEMA HMGP
Lead Agency/Department Responsible:	Administration and Wichita County OEM
Implementation Schedule:	Within 12-60 months of plan adoption, pending grant approval
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
Grant application has been submitted by county.

SECTION 18: MITIGATION ACTIONS

City of Pleasant Valley – Action #9	
Proposed Action:	Building Code Improvements: Strengthen building codes by evaluating building code requirements and adopt improvements that will result in more hazard-resistant structures.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce damages to structures and infrastructure; Reduce risk of injuries or fatalities.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Earthquake, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on New/Existing Buildings:	Reduces risk to new structures
Priority (High, Moderate, Low):	High
Estimated Cost:	\$5,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue
Lead Agency/Department Responsible:	Administration, Wichita County OEM and NORTEX Regional Planning Commission
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	Local Codes / Ordinances

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 18: MITIGATION ACTIONS

City of Pleasant Valley – Action #10	
Proposed Action:	Undertake an initiative to increase the number of flood insurance policies.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce flood risk and build resiliency; Increase flood risk awareness; Reduce damage impact on residents after a flood event; Reduce the burden on state and federal resources.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	Reduce risk to new and existing structures and infrastructure
Priority (High, Moderate, Low):	High
Estimated Cost:	\$5,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue
Lead Agency/Department Responsible:	Administration / Floodplain Administrator
Implementation Schedule:	Within 12 months of plan adoption
Incorporation into Existing Plans:	Floodplain Ordinance

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

SECTION 18: MITIGATION ACTIONS

City of Pleasant Valley – Action #11	
Proposed Action:	Improve Flood Warning: Identify sites where stream and electronic rain gauges are needed to expand the rainfall network rain gauges and provide active monitoring of the water rise.
BACKGROUND INFORMATION	
Site and Location:	Community-wide high-risk flood areas
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promotes hazard awareness. Reduce risk of injuries to citizens; Reduce burden on emergency services during and after a flood event.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Communication
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$20,000 estimated cost to install automated rain gauge network; \$20,000 estimated installation cost to install each stream gauge; \$1,000 per month estimated maintenance cost (USGS Gauge)
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 36 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Emergency Management Plan; Floodplain Ordinance

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Pleasant Valley – Action #12	
Proposed Action:	Identify and conduct flood risk analysis on high-risk areas: Identify and obtain analysis reports. Coordinate with Federal and state agencies to initiate flood mitigation projects to reduce the overall risk.
BACKGROUND INFORMATION	
Site and Location:	Community-wide high-risk flood areas
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Improve risk assessment; Reduce risk of damages or injuries
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication, Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures and infrastructure
Priority (High, Moderate, Low):	High
Estimated Cost:	\$20,000 to \$60,000 estimated cost per analysis
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: Red River Authority; GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 12-36 months of plan adoption
Incorporation into Existing Plans:	Floodplain Ordinance

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

SECTION 18: MITIGATION ACTIONS

City of Pleasant Valley – Action #13	
Proposed Action:	Provide Training for City staff: Conduct a variety of training activities and workshops including but not limited to resources through EMA Region VI, NFIP Regional Office, TDEM, TCEQ, TWDB, TFMA, EMAT and ASFPM.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promotes hazard awareness. Ensure appropriate response during and after a hazard event.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Earthquake, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$20,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration, Wichita County OEM and NORTEX Regional Planning Commission
Implementation Schedule:	Within 12-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Pleasant Valley – Action #14	
Proposed Action:	Acquisition and Relocation or Elevation of Structures: Identify potential structures and initiate acquisition and relocation or elevation projects to reduce the risk of future flood losses. Create a database of Repetitive Loss Properties, properties that have had flood insurance claims, and properties located in areas of high flood risk.
BACKGROUND INFORMATION	
Site and Location:	Community-wide SRL and RL properties
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Eliminate risk of flood damages to high-risk structures and prevent future losses in high-risk flood hazard areas; Reduce risk of injuries to citizens; Reduce burden on emergency services during and after a flood event
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Natural Systems Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on New/Existing Buildings:	Reduces risk to existing structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$16.5, \$13,700,000 acquisition and relocation, \$2,740,000, \$2,740,000 demolition (ICC Funds)
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 12-48 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Floodplain Ordinance

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 18: MITIGATION ACTIONS

City of Pleasant Valley – Action #15	
Proposed Action:	Increase Emergency Management Staff.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promotes hazard awareness. Ensure appropriate response during and after a hazard event.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Preparedness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Earthquake, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$55,000 initial equipment costs, \$100,000 per employee per year (estimated cost for salary, support, equipment, and benefits)
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TDEM; Federal Grants: FEMA HMA Grants, DOH
Lead Agency/Department Responsible:	Administration and Wichita County OEM
Implementation Schedule:	Within 60 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
Wichita County and communities in the county have additional emergency operations responsibilities as a result of the Department of Homeland Security, the Federal Emergency Management Agency and the Texas Division of Emergency Management following the Disaster of 9–11 (2001) and the Disaster Mitigation Act of 2000.
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Pleasant Valley – Action #16	
Proposed Action:	Obtain certification in the National Weather Service StormReady Program.
BACKGROUND INFORMATION	
Site and Location:	Community-wide critical facilities
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk to citizens by educating the public on how to prepare for hazards and disasters.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hail, Thunderstorm Wind, Tornado, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$10,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 24 months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Pleasant Valley – Action #17	
Proposed Action:	Designate HAZMAT Cargo Routes in Wichita County: A Hazardous Materials Transportation Study was completed by the Texas A&M Transportation Institute. The study identified HAZMAT highway, railway and pipeline transportation routes through Wichita County. The goal is to designate and placard HAZMAT Routes in critical areas.
BACKGROUND INFORMATION	
Site and Location:	Community-wide identified routes
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promotes hazard awareness. Ensure appropriate response during and after a hazard event.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Earthquake, Flood, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Transportation, Hazardous Materials
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$10,000 estimated cost to placard selected
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration, Wichita County OEM, and LEPC
Implementation Schedule:	Within 24 months of plan adoption, or as funding becomes available; On-going signage maintenance
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Pleasant Valley – Action #18	
Proposed Action:	Acquire and install generators with hard-wired quick connections at all critical facilities.
BACKGROUND INFORMATION	
Site and Location:	Community-wide critical facilities Local Volunteer Fire Department
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Provide power for critical facilities during power outages and ensure continuity of critical services.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Earthquake, Extreme Heat, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Energy (Power/Fuel)
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$3,000 study cost; \$20,000 cost per fire station and/or critical facilities
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	Within 60 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Helps ensure critical facilities continue to provide services during a power outage caused by unforeseen events.

SECTION 18: MITIGATION ACTIONS

City of Pleasant Valley – Action #19	
Proposed Action:	Implement education and awareness programs utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promote hazard awareness and protect citizens from potential injuries and damages.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Earthquake, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$5,000
Potential Funding Sources:	Local Funds (staff time), State and Federal Grants
Lead Agency/Department Responsible:	Administration and Local Fire Department
Implementation Schedule:	Within 12 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Pleasant Valley – Action #20	
Proposed Action:	Reduce Impacts on Elderly and Low-Income Persons: Public notification effort during extreme heat periods urging elderly and low-income persons to seek help if needed. Cooling stations will be in all of the participating communities in their public libraries or if unavailable, the libraries of neighboring jurisdictions.
BACKGROUND INFORMATION	
Site and Location:	Community-wide when maximum temperature in excess of 100 degrees that occurs on two or more consecutive days
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promote hazard awareness and protect citizens from potential injuries and damages.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Extreme Heat
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$5,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue
Lead Agency/Department Responsible:	Administration and Wichita County OEM
Implementation Schedule:	Within 36 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:

SECTION 18: MITIGATION ACTIONS

City of Pleasant Valley – Action #21	
Proposed Action:	Distribution of Fans and HVAC Repairs: A joint effort by local power companies, volunteer organizations, Wichita County, and participating communities to solicit funds in an effort to purchase and distribute box fans and make air conditioner repairs.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduces risk of injuries and fatalities to at risk populations during extreme weather events.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Extreme Heat
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Energy (Power/Fuel), Health/Medical
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$2,000 to purchase and distribute 100 box fans; \$3,000 estimated cost for a/c repairs
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; United Way, Rotary Clubs, Lions Clubs, American Red Cross, Churches and charitable organizations, power companies; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration and Wichita County OEM
Implementation Schedule:	Within 24-36 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	N/A

COMMENTS:

SECTION 18: MITIGATION ACTIONS

City of Pleasant Valley – Action #22	
Proposed Action:	Implement a tree trimming program that routinely clears tree limbs hanging in right-of-way: Identify and trim limbs clear tree limbs hanging in the rights-of-way to mitigate the loss of electricity from falling limbs.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce damages to infrastructure; Ensure continuity of services during and after event; Reduce damages associated with power outages; Reduce risk of injuries or fatalities to vulnerable populations
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm Wind, Hail, Lightning, Tornado, Winter Storm, Wildfire
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Energy (Power/Fuel)
Effect on New/Existing Buildings:	Reduce risk to new and existing structures and infrastructures
Priority (High, Moderate, Low):	High
Estimated Cost:	\$3,000 – \$10,000 depending on growth
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; Utility companies; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration, Local roads and grounds departments and local utility companies
Implementation Schedule:	Within 24-36 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Local Plan / Ordinances

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 18: MITIGATION ACTIONS

City of Pleasant Valley – Action #23	
Proposed Action:	Install lightning rods on existing and future communication infrastructures and other critical facilities: Install and maintain lightning rods on existing and future communication and critical facilities operated.
BACKGROUND INFORMATION	
Site and Location:	Community-wide critical facilities such as fire departments, police departments, public works, and city halls
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce damages to infrastructure; Ensure continuity of services during and after event; Reduce damages associated with power outages; Reduce risk of injuries or fatalities to vulnerable populations
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Lightning
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Energy (Power/Fuel)
Effect on New/Existing Buildings:	Reduce risk to new and existing structures and infrastructures
Priority (High, Moderate, Low):	High
Estimated Cost:	\$5,000 per facility
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; Utility companies; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Administration and Wichita County OEM
Implementation Schedule:	Within 12-60 months of plan adoption, pending grant approval
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
Grant application has been submitted by county.

SECTION 18: MITIGATION ACTIONS

CITY OF WICHITA FALLS

City of Wichita Falls – Action #1		
	Proposed Action:	Wichita County Stream Evaluation: Evaluation would assist in regional approach for solutions to reduce flooding for multiple channels within Wichita County.
	BACKGROUND INFORMATION	
	Site and Location:	City of Wichita Falls and Wichita County Holliday Creek, Wichita River, Beaver Creek
	Risk Reduction Benefit: (Current Cost/Losses Avoided)	Improve risk assessment; Reduce risk of damages or injuries through flood mitigation improvements; Reduce risk of damages and injuries.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to approximately 4,000 existing residential structures
Priority (High, Moderate, Low):	High
Estimated Cost:	\$500,000
Potential Funding Sources:	Local Budget, TWDB, HMG Fund
Lead Agency/Department Responsible:	Region 1 Flood Planning Group / Public Works / Wichita County
Implementation Schedule:	Within 2 years of plan adoption
Incorporation into Existing Plans:	Wichita County Drainage Master Plan City of Wichita Falls Drainage Master Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding. Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 18: MITIGATION ACTIONS

City of Wichita Falls – Action #2	
Proposed Action:	Development of Ringgold Project to provide another water reservoir for the City of Wichita Falls and surrounding jurisdictions and counties.
BACKGROUND INFORMATION	
Site and Location:	Community-wide with the proposed reservoir being constructed in the Northwest part of Clay County.
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Protect public health and safety; Protect existing and new properties; Promote growth in a sustainable manner; Maximize the use of outside sources for funding.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$385,000,000
Potential Funding Sources:	Utilizing Water/Sewer fund and Bonds
Lead Agency/Department Responsible:	Public Works / Engineering
Implementation Schedule:	On-going
Incorporation into Existing Plans:	Drought Contingency Plan

COMMENTS:
Project is in permitting phase

SECTION 18: MITIGATION ACTIONS

City of Wichita Falls – Action #3	
Proposed Action:	Continuing use of water conservation and safety procedures.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Protect public health and safety; Increase public understanding, support, and demand for hazard mitigation; Maximize the use of outside sources for funding.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$50,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Development Services / Emergency Management / Public Works / Public Information
Implementation Schedule:	On-going
Incorporation into Existing Plans:	Drought Contingency Plan

COMMENTS:
Currently in Stage 1 of drought conservation tips.

SECTION 18: MITIGATION ACTIONS

City of Wichita Falls – Action #4	
Proposed Action:	Continue annual Vegetation Removal Project to Control Flooding Along the Wichita River in Wichita Falls.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Protect public health and safety; Protect existing and new properties; Maximize the use of outside sources for funding.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$150,000
Potential Funding Sources:	General Fund, FEMA Grant
Lead Agency/Department Responsible:	Public Works / Engineering
Implementation Schedule:	Annually
Incorporation into Existing Plans:	Capital Improvement Plan

COMMENTS:
Currently in Stage 1 of drought conservation tips.
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 18: MITIGATION ACTIONS

City of Wichita Falls– Action #5	
Proposed Action:	Tornado “Safe Room” Construction: Participate in the FEMA Individual “Safe Room” program by accepting applications from the citizens of Wichita County to have licensed NTSA or ATSA approved Safe Rooms installed in private residences
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce damages to structures and infrastructure; Reduce risk of injuries or fatalities.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$3,000,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; FEMA HMGP
Lead Agency/Department Responsible:	Development Services / Emergency Management
Implementation Schedule:	Within 1 to 5 years of plan adoption, pending grant approval
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
Grant application has been submitted by County.

SECTION 18: MITIGATION ACTIONS

City of Wichita Falls – Action #6	
Proposed Action:	Implement education and awareness programs utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Promote hazard awareness and protect citizens from potential injuries and damages.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Drought, Extreme Heat, Earthquake, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$25,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; Stormwater Fund; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Public Information Office / Emergency Management
Implementation Schedule:	On-going
Incorporation into Existing Plans:	N/A

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

SECTION 18: MITIGATION ACTIONS

City of Wichita Falls – Action #7	
Proposed Action:	Retrofit power poles to critical facilities with power wraps to strengthen the poles to prevent breakage.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Provide power for critical facilities during power outages and ensure continuity of critical services.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Earthquake, Extreme Heat, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Energy (Power/Fuel)
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$500,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	Within 60 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Emergency Management Plan; Capital Improvement Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Helps ensure critical facilities continue to provide services during a power outage caused by unforeseen events.

SECTION 18: MITIGATION ACTIONS

City of Wichita Falls – Action #8	
Proposed Action:	Acquire and install generators with hard-wired quick connections at all critical facilities.
BACKGROUND INFORMATION	
Site and Location:	Community-wide critical facilities
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Provide power for critical facilities during power outages and ensure continuity of critical services.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Earthquake, Extreme Heat, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Energy (Power/Fuel)
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	\$500,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Emergency Management Office / Central Services / Building Maintenance
Implementation Schedule:	Within 60 months of plan adoption, or as funding becomes available
Incorporation into Existing Plans:	Emergency Management Plan; Capital Improvement Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Helps ensure critical facilities continue to provide services during a power outage caused by unforeseen events.

SECTION 18: MITIGATION ACTIONS

City of Wichita Falls – Action #9	
Proposed Action:	Harden/retrofit critical facilities to hazard-resistant levels.
BACKGROUND INFORMATION	
Site and Location:	Community-wide critical facilities
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce damages at critical facilities; Ensure continuity of critical services during and after event; Reduce risk of injury to emergency and critical personnel.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Earthquake, Extreme Heat, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	\$2,500,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Emergency Preparedness
Implementation Schedule:	Emergency Management / Public Works / Building Maintenance
Incorporation into Existing Plans:	Emergency Management Plan; Capital Improvement Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation, and prevents injury to residents.

SECTION 18: MITIGATION ACTIONS

City of Wichita Falls – Action #10	
Proposed Action:	Install and maintain fuel reduction and fire-resistant landscaping at critical facilities. Implement fuels reduction program.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk of wildfires and the spread of wildfire through targeted fuels reduction programs.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Natural Systems Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures and infrastructure
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$300,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Parks / Fire Department / Emergency Management / Public Works
Implementation Schedule:	Within 24 months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan; Capital Improvement Plan

COMMENTS:

SECTION 18: MITIGATION ACTIONS

City of Wichita Fall – Action #11	
Proposed Action:	Develop and maintain a community wildfire protection plan.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce risk of wildfires and the spread of wildfire. Reduces risk of damage to properties and loss of life.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$30,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Emergency Management / Fire Department
Implementation Schedule:	Within 24 months of plan adoption
Incorporation into Existing Plans:	Local Plans / Ordinances

COMMENTS:

SECTION 18: MITIGATION ACTIONS

City of Wichita Fall – Action #12	
Proposed Action:	Implement policy to bury power lines in new and existing subdivisions to alleviate downed power lines.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit: (Current Cost/Losses Avoided)	Reduce damages to infrastructure; Ensure continuity of critical services during and after event; Reduce damages associated with power outages; Reduce risk of injuries or fatalities to vulnerable populations.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Winter Storm, Wildfire
Community Lifeline: (Safety/Security, Food, Water Shelter, Health/Medical, Energy (Power/Fuel), Communication, Transportation, Hazardous Materials)	Safety/Security, Energy (Power/Fuel)
Effect on New/Existing Buildings:	Reduce risk to new and existing structures and infrastructure
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	\$125,000
Potential Funding Sources:	Local Department Budget, Staff time, Bonds, Tax Revenue; State Grants: GLO, TAMFS, TDA, TDEM, TWDB, TXDOT; Federal Grants: FEMA HMA Grants, CDBG, CDC, DOH, EDA, EPA, HUD, NFIP, NFWF, NOAA, NRCS, SBA, USACE, USDA, USFS, USFWS
Lead Agency/Department Responsible:	Planning / Public Works
Implementation Schedule:	Within 24 months of plan adoption
Incorporation into Existing Plans:	Local Plans / Ordinances; Emergency Management Plan; Capital Improvement Plan

COMMENTS:
NFIP & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation, and prevents injury to residents.



SECTION 19 PLAN MAINTENANCE

SECTION 19: PLAN MAINTENANCE

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PLAN MAINTENANCE PROCEDURES

The following is an explanation of how the participating jurisdictions within Wichita County, and the general public will be involved in implementing, evaluating, and enhancing the Plan over time. When the plan is discussed in all maintenance procedures it includes mitigation actions and hazard assessments. The sustained hazard mitigation planning process consists of four main parts:

- Incorporation
- Monitoring and Evaluation
- Updating
- Continued Public Involvement

INCORPORATION

Participating jurisdictions within Wichita County will be responsible for further development and implementation of mitigation actions. Each action has been assigned to a specific department within the participating jurisdictions. The following describes the process by which participating jurisdictions will incorporate elements of the mitigation plan into other planning mechanisms.

PROCESS OF INCORPORATION

Once the Plan Update is adopted, participating jurisdictions within Wichita County will implement actions based on priority and the availability of funding. The planning area currently implements policies and programs to reduce loss to life and property from hazards. The mitigation actions developed for this Plan Update enhance this ongoing 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 seeks funds to implement actions. An implementation time period or a specific implementation date has been assigned to each action as an incentive for completing each task and gauging whether actions are implemented in a timely manner.

Participating jurisdictions within Wichita County will integrate implementation of their mitigation actions with other plans and policies such as construction standards and emergency management plans, and ensure that these actions, or proposed projects, are reflected in other planning efforts.

SECTION 19: PLAN MAINTENANCE

Coordinating and integrating components of other plans and policies into goals and objectives of the Plan Update will further maximize funding and provide possible cost-sharing of key projects, thereby reducing loss of lives and property and mitigating hazards affecting the area.

Upon formal adoption of the Plan Update, planning team members from each participating jurisdiction will work to integrate the hazard mitigation strategies into other plans and codes as they are developed. Participating team members will conduct periodic reviews of plans and policies, once per year at a minimum, and analyze the need for revisions in light of the approved Plan. The planning team will review all comprehensive land use plans (applicable jurisdictions only), capital improvement plans (applicable jurisdictions only), annual budget reviews, and emergency operations or management plans (applicable jurisdictions only) to guide and control development. Participating jurisdictions will ensure that capital improvement planning (applicable jurisdictions only) in the future will also contribute to the goals of this Hazard Mitigation Plan Update to reduce the long-term risk to life and property from all hazards. Within one year of formal adoption of the Hazard Mitigation Plan Update, existing planning mechanisms will be reviewed by each jurisdiction.

Wichita County is committed to supporting the participating jurisdictions as they implement their mitigation actions. Planning team members will review and revise, as necessary, the long-range goals and objectives in strategic plan and budgets to ensure that they are consistent with this mitigation action plan. Additionally, the planning team will work to advance the goals of this hazard mitigation plan through its routine, ongoing long-range planning, budgeting, and work processes.

Table 19-1 identifies types of planning mechanisms and examples of methods for incorporating the Plan Update into other planning efforts. The team members, listed in Table 19-2 below, will be responsible for the review of these planning mechanisms and their incorporation of the plan, with the exception of the Floodplain Management Plans; the jurisdictions who have a Floodplain Administrator on staff will be responsible for incorporating the Plan when floodplain management plans are updated or new plans are developed.

Table 19-1. Methods of Incorporation of the Plan

PLANNING MECHANISM	DEPARTMENT / TITLE RESPONSIBLE	INCORPORATION OF PLAN
Annual Budget Review	Wichita County: EMC City of Burkburnett: Fire Chief City of Cashion Community: EMC City of Electra: City Manager City of Iowa Park: City Manager City of Pleasant Valley: City Administrator City of Wichita Falls: City Manager	Various departments and key personnel that participated in the planning process for participating jurisdictions within Wichita County will review the Plan and mitigation actions therein when conducting their annual budget review. Allowances will be made in accordance with grant applications sought, and mitigation actions that will be undertaken, according to the implementation schedule of the specific action.

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PLANNING MECHANISM	DEPARTMENT / TITLE RESPONSIBLE	INCORPORATION OF PLAN
Capital Improvement Plans	City of Burkburnett: Fire Chief	The City of Burkburnett has a Capital Improvement Plan (CIP) in place or under development. Prior to any revisions to the CIP, city departments will review the risk assessment and mitigation strategy sections of the HMAP, as limiting public spending in hazardous zones is one of the most effective long-term mitigation actions available to local governments.
Comprehensive Plans	City of Wichita Falls: City Manager	The City of Wichita Falls has long-term Comprehensive Development Plans 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.
Floodplain Management Plans	Wichita County: Floodplain Administrator City of Burkburnett: Floodplain Administrator City of Electra: Floodplain Administrator City of Iowa Park: Floodplain Administrator City of Pleasant Valley: Floodplain Administrator City of Wichita Falls: Floodplain Administrator	Floodplain management plans include preventative and corrective actions to address the flood hazard. Therefore, the actions for flooding and information found in Section 7 of this Plan Update discussing the people and property at risk to flood will be reviewed and revised when participating jurisdictions within Wichita County update their management plans or develops new plans.
Grant Applications	Wichita County: EMC City of Burkburnett: Fire Chief City of Cashion Community: EMC City of Electra: City Manager City of Iowa Park: City Manager City of Pleasant Valley: City Administrator City of Wichita Falls: EMC	The Plan will be evaluated by participating jurisdictions within Wichita County when grant funding is sought for mitigation projects. If a project is not in the Plan Update, a Plan Revision may be necessary to include the action in the Plan.
Regulatory Plans	Wichita County: EMC City of Burkburnett: Fire Chief City of Cashion Community: EMC City of Electra: City Manager City of Pleasant Valley: City Administrator	Currently, several participating jurisdictions within Wichita County have regulatory plans in place, such as Emergency Management Plans, Continuity of Operations Plans, Land Use Plans, and Evacuation Plans. The

SECTION 19: PLAN MAINTENANCE

PLANNING MECHANISM	DEPARTMENT / TITLE RESPONSIBLE	INCORPORATION OF PLAN
	City of Wichita Falls: EMC	Plan Update will be consulted when county and city departments review or revise their current regulatory planning mechanisms, or in the development of regulatory plans that are not currently in place.

MONITORING AND EVALUATION

Periodic revisions of the Plan are required to ensure that goals, objectives, and mitigation actions are kept current. When the plan is discussed in these sections it includes the risk assessment and mitigation actions as a part of the monitoring, evaluating, updating and review process. Revisions may be required to ensure the Plan is in compliance with federal and state statutes and regulations. This section outlines the procedures for completing Plan revisions, updates, and review. Table 19-2 indicates the department and title of the party responsible for Plan monitoring, evaluating, updating, and review of the Plan.

Table 19-2. Team Members Responsible for Plan Monitoring, Evaluating, Updating, and Review of the Plan

JURISDICTION	TITLE
Wichita County	Emergency Management Coordinator
City of Burkburnett	Fire Chief
City of Cashion Community	Emergency Management Coordinator
City of Electra	City Manager
City of Iowa Park	City Manager
City of Pleasant Valley	City Administrator
City of Wichita Falls	Emergency Management Coordinator

MONITORING

Designated Planning Team members are responsible for monitoring, evaluating, updating, and reviewing the Plan, as shown in Table 19-2. Individuals holding the title listed in Table 19-2 will be responsible for monitoring the Plan on an annual basis. Plan monitoring includes reviewing and incorporating into the Plan other existing planning mechanisms that relate or support goals and objectives of the Plan; monitoring the incorporation of the Plan into future updates of other existing planning mechanisms as appropriate; reviewing mitigation actions submitted and coordinating with various county and city departments to determine if mitigation actions need to be re-evaluated and updated; evaluating and updating the Plan as necessary; and monitoring plan maintenance to ensure that the process described is being followed, on an annual basis, throughout the planning process. The Planning Team will develop a brief report that identifies policies and actions in the plan that have been successfully implemented and any changes in the

SECTION 19: PLAN MAINTENANCE

implementation process needed for continued success. A summary of meeting notes will report the particulars involved in developing an action into a project. In addition to the annual monitoring, the Plan will be similarly reviewed immediately after extreme weather events including but not limited to state and federally declared disasters.

EVALUATION

As part of the evaluation process, the Planning Team will assess changes in risk; determine whether the implementation of mitigation actions is on schedule; determine whether there are any implementation problems, such as technical, political, legal, or coordination issues; and identify changes in land development or programs that affect mitigation priorities for each respective department or organization.

The Planning Team will meet on an annual basis to evaluate the Plan and identify any needed changes and assess the effectiveness of the plan achieving its stated purpose and goals. The team will evaluate the number of mitigation actions implemented along with the loss-reduction associated with each action. Actions that have not been implemented will be evaluated to determine if any social, political, or financial barriers are impeding implementation and if any changes are necessary to improve the viability of an action. The team will evaluate changes in land development and/or programs that affect mitigation priorities in their respective jurisdictions. The annual evaluation process will help to determine if any changes are necessary. In addition, the Plan will be similarly evaluated immediately after extreme weather events including but not limited to state and federally declared disasters.

UPDATING

PLAN REVISIONS

At any time, minor technical changes may be made to update the Wichita County Hazard Mitigation Action Plan Update 2024. Material changes to mitigation actions or major changes in the overall direction of the Plan or the policies contained within it, must be subject to formal adoption by the participating jurisdictions.

The participating jurisdictions within Wichita County will review proposed revisions and vote to accept, reject, or amend the proposed change. Upon ratification, the Revision will be transmitted to TDEM.

In determining whether to recommend approval or denial of a Plan Revision request, participating jurisdictions will consider the following factors:

- Errors or omissions made in the identification of issues or needs during the preparation of the Plan Update;
- New issues or needs that were not adequately addressed in the Plan Update; and
- Changes in information, data, or assumptions from those on which the Plan Update was based.

FIVE (5) YEAR REVIEW

The Plan will be thoroughly reviewed by the Planning Team at the end of three years from the approval date, to determine whether there have been significant changes in the planning area that necessitate changes in the types of mitigation actions proposed. Factors that may affect the content of the Plan include new development in identified hazard areas, increased exposure to

SECTION 19: PLAN MAINTENANCE

hazards, disaster declarations, increase or decrease in capability to address hazards, and changes to federal or state legislation.

The Plan review process provides the participating jurisdictions within Wichita County an opportunity to evaluate mitigation actions that have been successful, identify losses avoided due to the implementation of specific mitigation measures, and address mitigation actions that may not have been successfully implemented as assigned.

It is recommended that the full Executive and Advisory Planning Team (Section 2, Tables 2-1 and 2-2) meet to review the Plan at the end of three years because grant funds may be necessary for the development of a five-year update. Reviewing planning grant options in advance of the five-year Plan update deadline is recommended considering the timelines for grant and planning cycles can be in excess of a year.

Following the Plan review, any revisions deemed necessary will be summarized and implemented according to the reporting procedures and Plan Revision process outlined herein. Upon completion of the review, update, and revision process the revised Plan will be submitted to TDEM for final review and approval in coordination with FEMA.

CONTINUED PUBLIC INVOLVEMENT

Public input was an integral part of the preparation of this Plan and will continue to be essential for Plan updates. The public will be directly involved in the annual evaluation, monitoring, reviews and cyclical updates. Changes or suggestions to improve or update the Plan will provide opportunities for additional public input.

The public can review the Plan on the participating jurisdictions' websites, where officials and the public are invited to provide ongoing feedback, via email.

The Planning Team may also designate voluntary citizens from the planning area or willing stakeholder members from the private sector businesses that were involved in the Plan's development to provide feedback on an annual basis. It is important that stakeholders and the immediate community maintain a vested interest in preserving the functionality of the planning area as it pertains to the overall goals of the mitigation plan. The Planning Team is responsible for notifying stakeholders and community members on an annual basis and maintaining the Plan.

Media, including local newspaper and radio stations, will be used to notify the public of any maintenance or periodic review activities during the implementation, monitoring, and evaluation phases. Additionally, local news media will be contacted to cover information regarding Plan updates, status of grant applications, and project implementation. Local and social media outlets, such as Facebook and Twitter, will keep the public and stakeholders apprised of potential opportunities to fund and implement mitigation projects identified in the Plan.



APPENDIX A PLANNING TEAM

APPENDIX A: PLANNING TEAM

Planning Team Members	1
Stakeholders	2

PLANNING TEAM MEMBERS

The Wichita County Hazard Mitigation Action Plan 2024 was organized using a direct representative model. An Executive Planning Team from the participating jurisdictions, shown in Table A-1, was formed to coordinate planning efforts and request input and participation in the planning process. Table A-2 reflects the Advisory Planning Team, consisting of area organizations and departments that participated throughout the planning process. Table A-3 is comprised of stakeholders who were invited to provide Plan input. Public outreach efforts and meeting documentation is provided in Appendix E.

Table A-1. Executive Planning Team

ORGANIZATION / DEPARTMENT	TITLE
Wichita County	Assistant Emergency Management Coordinator
Wichita County	Emergency Management Coordinator
City of Burkburnett	Fire Chief
City of Cashion Community	Mayor
City of Electra	City Manager
City of Iowa Park	City Manager
City of Pleasant Valley	City Administrator
City of Wichita Falls	Emergency Management Coordinator

Table A-2. Advisory Planning Team

ORGANIZATION / DEPARTMENT	TITLE
Wichita County	County Judge
Wichita County	County Commissioner Pct 1
Wichita County	County Commissioner Pct 2
Wichita County	County Commissioner Pct 3
Wichita County	County Commissioner Pct 4
Wichita County	County Point of Contact for Medical Arena
City of Burkburnett	Chamber of Commerce Board Vice President / Public Safety

APPENDIX A: PLANNING TEAM

ORGANIZATION / DEPARTMENT	TITLE
City of Burkburnett	City Manager / Public Safety Director
City of Burkburnett	Director of Administration
City of Cashion Community	Emergency Management Coordinator
City of Cashion Community	Mayor Pro-Tem
City of Electra	City Secretary
City of Electra	Fire Chief
City of Electra	Mayor
City of Electra	Police Chief
City of Iowa Park	City Secretary
City of Iowa Park	Fire Chief
City of Iowa Park	Mayor
City of Pleasant Valley	Mayor
City of Wichita Falls	Emergency Management Intern
City of Wichita Falls	Deputy Director of Public Works
City of Wichita Falls	Director of Development Services ¹

STAKEHOLDERS

The following groups listed in Table A-3 represent a list of organizations invited to stakeholder meetings, public meetings, and workshops throughout the planning process and include: members of community groups, non-profit organizations, private businesses, utility providers, neighboring counties, schools and universities, state and federal agencies, and legislators. The public were also invited to participate via e-mail throughout the planning process. Many of the invited organizations and stakeholders participated and were integral to providing comments and data for the Plan. For a list of attendees at meetings, please see Appendix E².

Table A-3. Stakeholders

AGENCY	TITLE	STAKEHOLDER TYPE
American Medical Response	Operations Manager	Private Organization

¹ This department oversees Building Inspections, Code Enforcement, Lake Lot Administration, Neighborhood Resources, Planning and Property Management.

² Information contained in Appendix E is exempt from public release under the Freedom of Information Act (FOIA).

APPENDIX A: PLANNING TEAM

AGENCY	TITLE	STAKEHOLDER TYPE
American Red Cross	Chief Development Officer	Nonprofit / Community-Based Organization
American Red Cross	Chief Operations Officer	Nonprofit / Community-Based Organization
American Red Cross	Regional Disaster Officer	Nonprofit / Community-Based Organization
Archer County	Emergency Management Coordinator	Neighboring Community
Atmos	Operations Representative	Utility Provider
Baylor County	County Judge	Neighboring Community
Burkburnett ISD	Director of Facilities	Academia
Burkburnett ISD	Superintendent	Academia
Central Texas Food Bank	Media Inquiries Representative	Nonprofit / Community-Based Organization
City View ISD	ISD Chief of Police	Academia
City View ISD	Superintendent	Academia
Clay County	Emergency Management Coordinator	Neighboring Community
Disaster Helping Hands Inc.	Agency Representative	Nonprofit / Community-Based Organization
Electra ISD	Administrative Assistant for the Superintendent	Academia
Electra ISD	Maintenance Coordinator	Academia
Environmental Protection Agency, Region 6	Director of Superfund and Emergency Management Division	Federal Agency
Environmental Protection Agency, Region 6	Regional Administrator	Federal Agency
Friberg-Copper Water Supply Corporation	Utility Contact	Utility Provider
Hotter'N Hell Hundred / Wichita Falls Bicycling Club	Executive Director	Nonprofit / Community-Based Organization
Interfaith Ministries of Wichita Falls	Executive Director	Nonprofit / Community-Based Organization
Iowa Park ISD	ISD Safety and Security Secretary	Academia
Iowa Park ISD	Superintendent	Academia
Magic Aire	Operational Engineer	Private Organization

APPENDIX A: PLANNING TEAM

AGENCY	TITLE	STAKEHOLDER TYPE
Mark Inman Insurance Agency	Insurance Representative	Private Organization
Meals on Wheels	General Representative	Nonprofit / Community-Based Organization
Midwestern Healthcare Center	General Representative	Healthcare Agency
Midwestern State University	Chemical Safety Manager	Academia
Midwestern State University	Chief of Police	Academia
Midwestern State University	Director of Board and Government Relations	Academia
National Weather Service	District (Oklahoma) Representative	Federal Agency
NOAA	Assistant Administrator National Env. Satellite, Data, and Info Service	Federal Agency
NOAA	Deputy Assistant Administrator National Env. Satellite, Data, and Info Service	Federal Agency
NORTEX Regional Planning Commission	Director of Emergency Planning	Regional Agency
NORTEX Regional Planning Commission	Emergency Planner	Regional Agency
NORTEX Regional Planning Commission	Executive Director	Regional Agency
Red River Authority	General Manager	Utility Provider
Region 1 Flood Planning Group	Region Representation	Regional Agency / Involved in Mitigation Activities
Sealed Air Corp.	Manufacturing Plant Environment Safety Coordinator	Private Organization
Sheppard Air Force Base	Fire Captain	Private Organization
Sheppard Air Force Base	Fire Chief	Private Organization
Sheppard Air Force Base	General Representative	Private Organization
Sheppard Air Force Base	Firefighter	Private Organization
Texas A&M Agrilife Extension	District Representative of the Wichita County Office	State Agency
Texas A&M Forest Service	Regional WUI Coordinator	State Agency
Texas A&M Forest Service	Resource Specialist I	State Agency

APPENDIX A: PLANNING TEAM

AGENCY	TITLE	STAKEHOLDER TYPE
Texas A&M Forest Service	Representative	State Agency
Texas Commission on Environmental Quality, Region 3	Executive Assistant	State Agency
Texas Commission on Environmental Quality, Region 3	Regional Director	State Agency
Texas Division of Emergency Management	District 3 Coordinator Representative for Wichita Falls	State Agency
Texas Division of Emergency Management	Unit Chief Recovery - Mitigation Branch	State Agency
Texas Department of Health Services, Region 2/3	DSHS Regional 2/3 Representative	State Agency
Texas Department of Housing and Community Affair	General Media Representative	State Agency
Texas Department of Transportation	District Engineer	State Agency
Texas Department of Transportation	Wichita Falls Engineer	State Agency
Texas Floodplain Management Association, Region 4	Region 4 Director	State Agency
Texas Health and Human Services Commission	General Representative	State Agency
Texas Historical Commission	Executive Director	State Agency
Texas Parks and Wildlife	District Leader for Cross Timbers Wildlife District, Wichita County	State Agency
Texas Parks and Wildlife	Game Warden	State Agency
Texas State Legislator	District 69 Representative	State Legislature
Texas State Senate	District 28 Senator	State Legislature
Texas State Senate	District 30 Senator	State Legislature
Texas Water Development Board	Assistant Deputy Executive Administrator - Water Supply & Infrastructure	State Agency
Texas Water Development Board	Deputy Executive Administrator - Planning	State Agency

APPENDIX A: PLANNING TEAM

AGENCY	TITLE	STAKEHOLDER TYPE
Texas Water Development Board	Deputy Executive Administrator - Water Supply & Infrastructure	State Agency
Texas Windstorm Insurance Association	General Medical Representative	State Agency
U.S. Army Corps of Engineers / Texas Silver Jackets	Regional Representative	Federal Agency
U.S. Fish & Wildlife	Public Affairs Specialist for Texas	Federal Agency
U.S. Fish & Wildlife	State Coordinator for Texas, Partners for Fish and Wildlife Program	Federal Agency
United Regional Healthcare System	Life Safety Specialist	Healthcare Agency
United Regional Healthcare System	Manager of Operations	Healthcare Agency
United Way	Director of North Texas Area	Private Organization
University Park Manor	General Representative	Healthcare Agency
Vernon College	Director of Campus Police	Academia
Vernon College	University President	Academia
Vitro Industries	Manufacturing Plant Senior EHS Leader	Private Organization
Wichita County Human Services Department	General Representative	County Organization
Wichita Falls Health District	Preparedness Specialist	Healthcare Agency
Wichita Falls ISD	Risk & Contract Manager	Academia
Wichita Falls ISD	Superintendent	Academia
Wichita Falls Public Health District	Public Health Preparedness Manager	Healthcare Agency
Wichita Falls Public Health District	Public Health Specialist	Healthcare Agency
Wichita Valley Water Supply Corporation	Corporation Representative	Utility Provider
Wilbarger County	County Judge	Neighboring Community
Zavala Hispanic Cultural Initiative	Program Representative	Nonprofit/Community-Based Organization



APPENDIX B PUBLIC SURVEY RESULTS

APPENDIX B: PUBLIC SURVEY RESULTS

Overview	1
Public Survey Results	2

OVERVIEW

Wichita County prepared a public survey that requested public opinion on a wide range of questions relating to natural hazards. The survey was made available via the county’s websites, along with participating jurisdictions. This survey link was also distributed at public meetings and stakeholder events throughout the planning process.

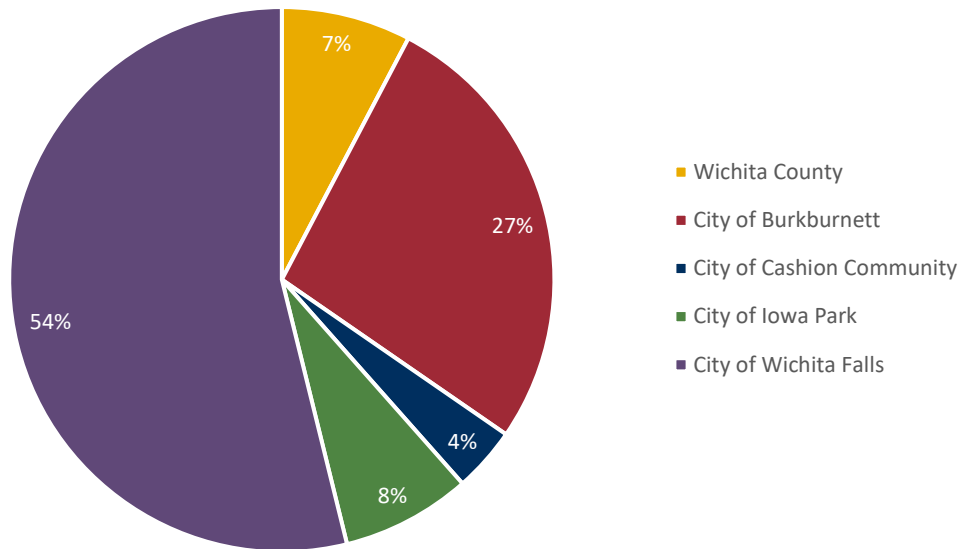
A total of 26 surveys were collected, the results of which are analyzed in Appendix B. The purpose of the survey was twofold: 1) to solicit public input during the planning process, and 2) to help the jurisdictions identify any potential actions or problem areas.

The following survey results depict the percentage of responses for each answer. Similar responses have been summarized for questions that did not provide a multiple-choice answer or that required an explanation.

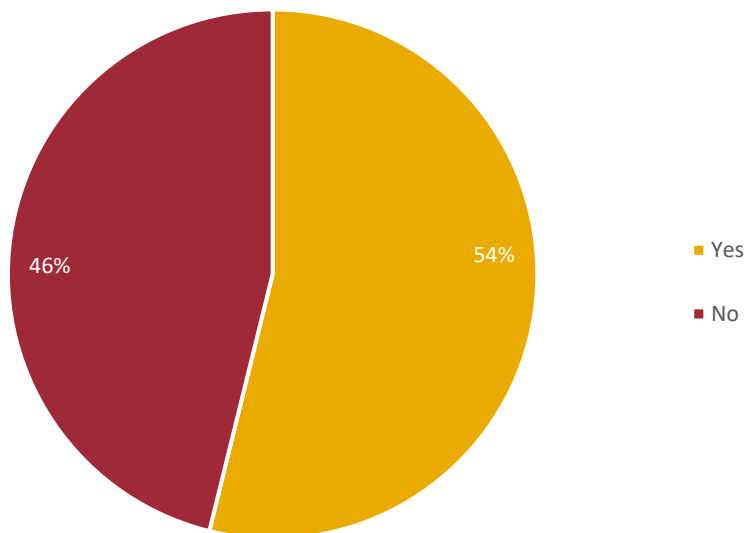
APPENDIX B: PUBLIC SURVEY RESULTS

PUBLIC SURVEY RESULTS

1. Please state the jurisdiction (city or community) where you reside.

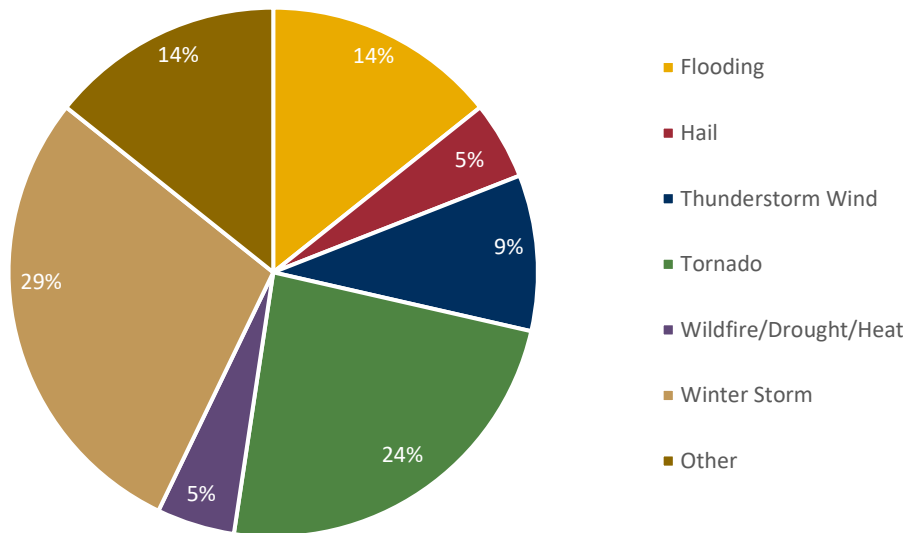


2. Have you ever experienced or been impacted by a disaster?

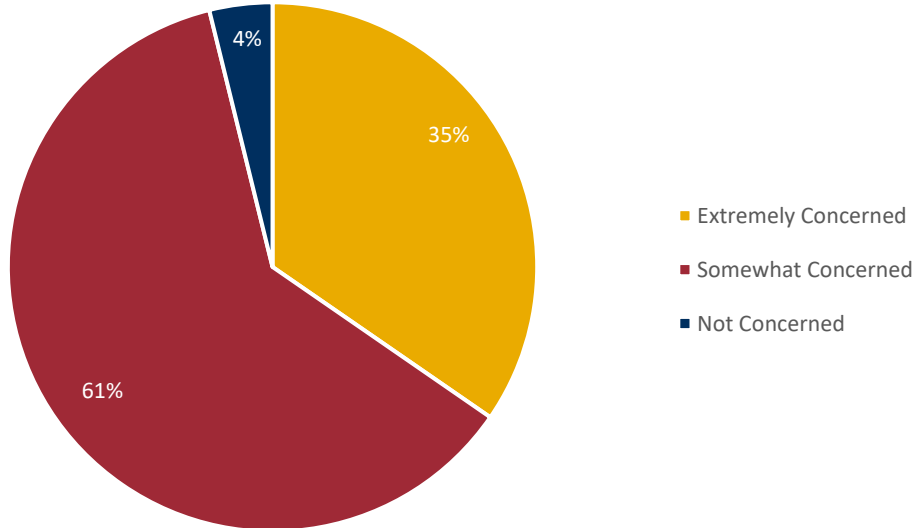


APPENDIX B: PUBLIC SURVEY RESULTS

3. If you answered “Yes” to Question #2, please explain.

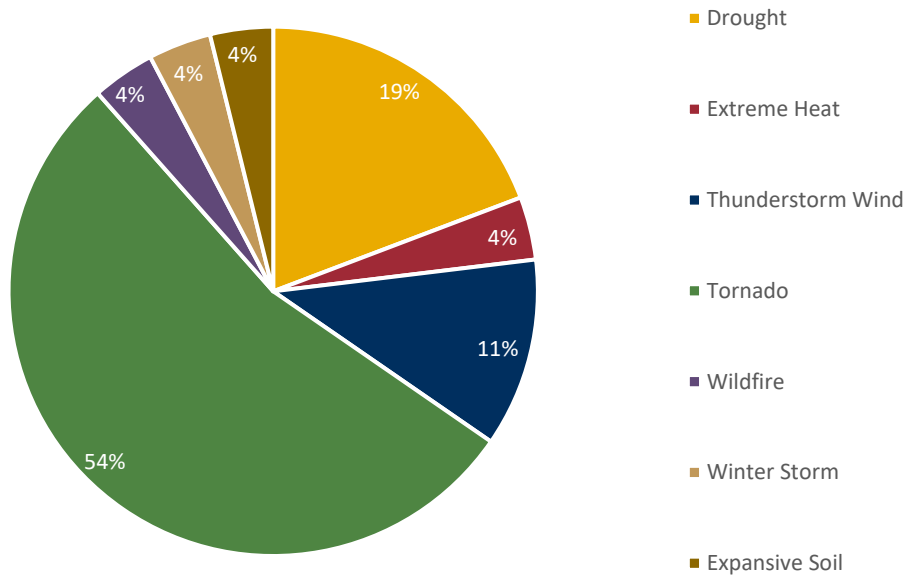


4. How concerned are you about the possibility of your community being impacted by a disaster?

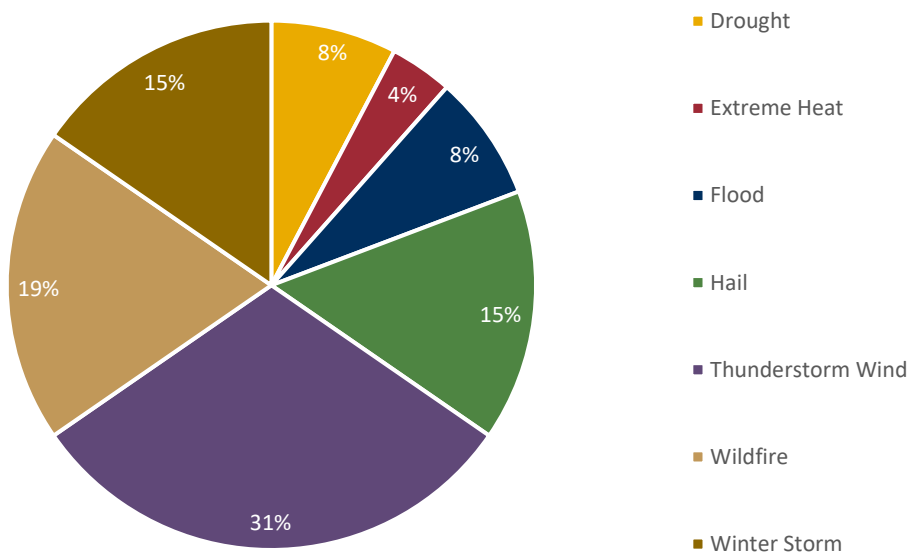


APPENDIX B: PUBLIC SURVEY RESULTS

5. Please select the one hazard you think is the highest threat to your neighborhood:

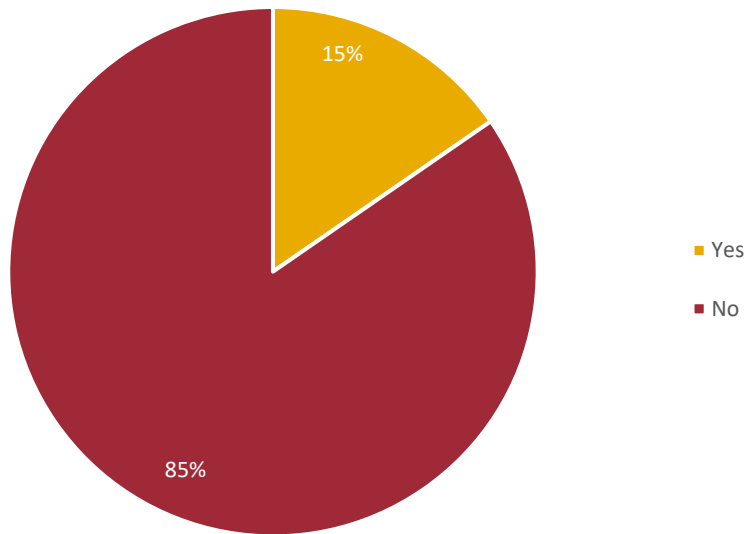


6. Please select the one hazard you think is the second highest threat to your neighborhood:

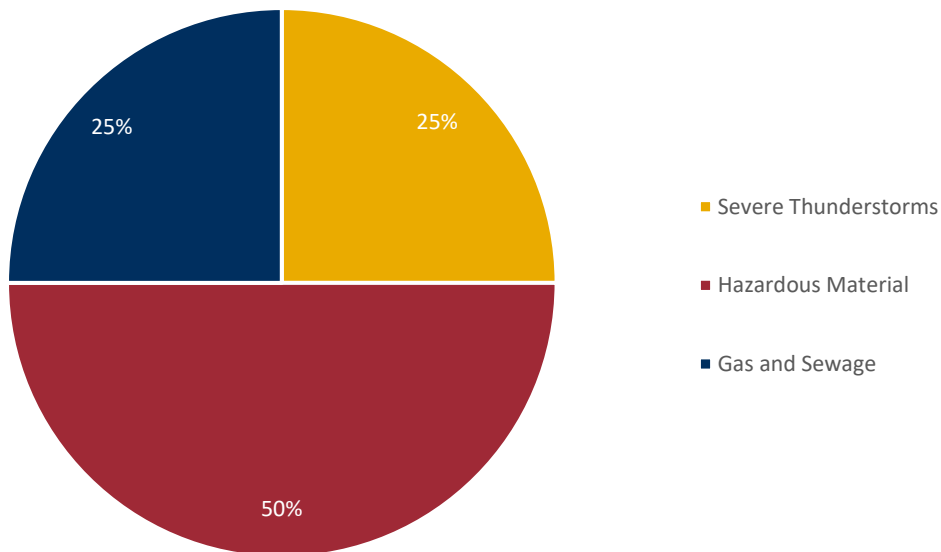


APPENDIX B: PUBLIC SURVEY RESULTS

7. Is there another hazard not listed above that you think is a wide-scale threat to your neighborhood?

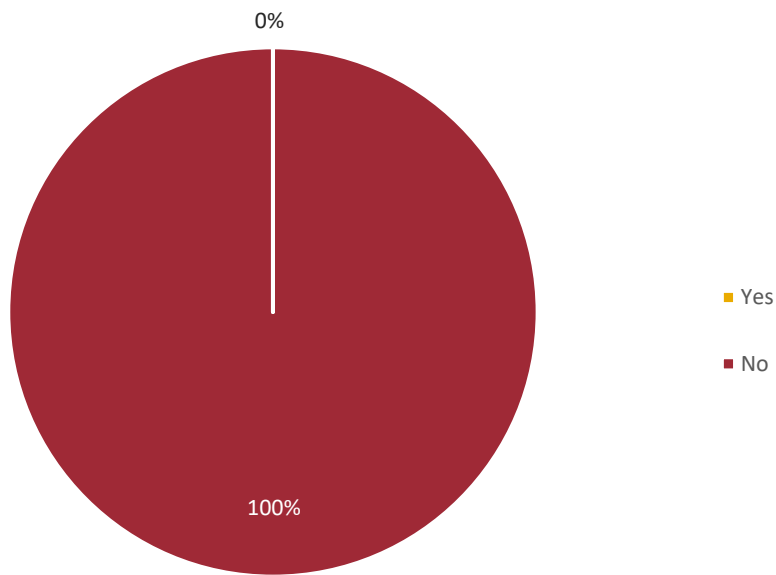


8. If you answered "Yes" to Question #7, please explain.

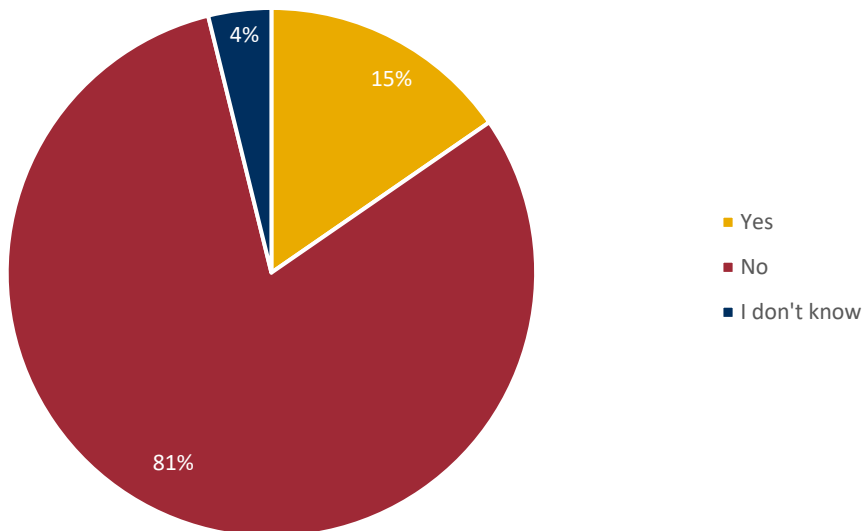


APPENDIX B: PUBLIC SURVEY RESULTS

9. Is your home located in a floodplain?

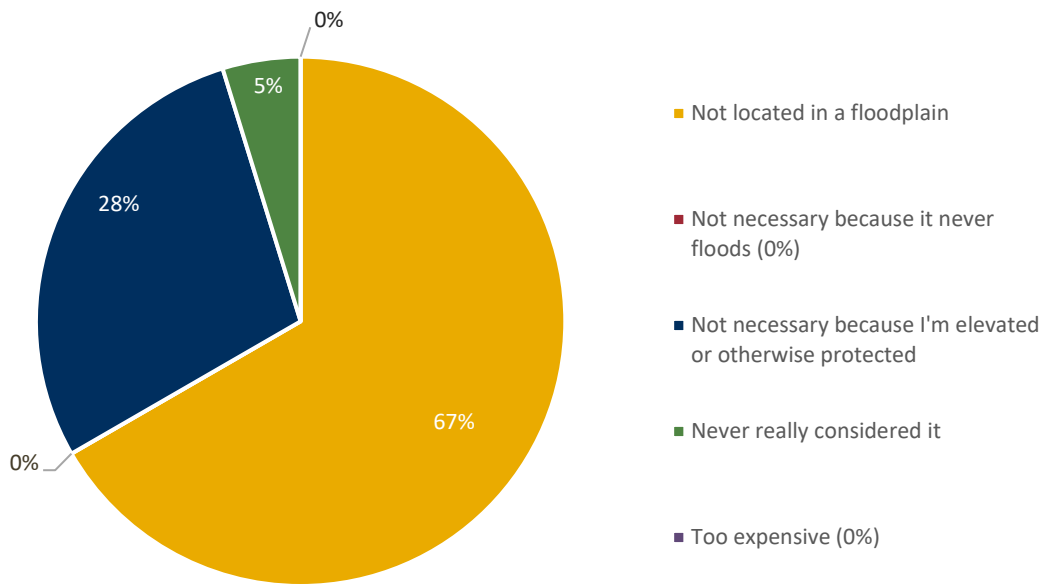


10. Do you have flood insurance?

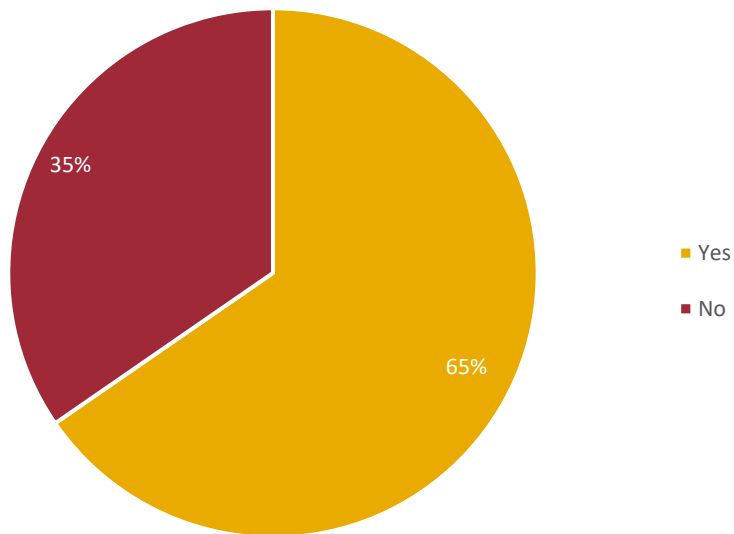


APPENDIX B: PUBLIC SURVEY RESULTS

11. If you do not have flood insurance, why not?

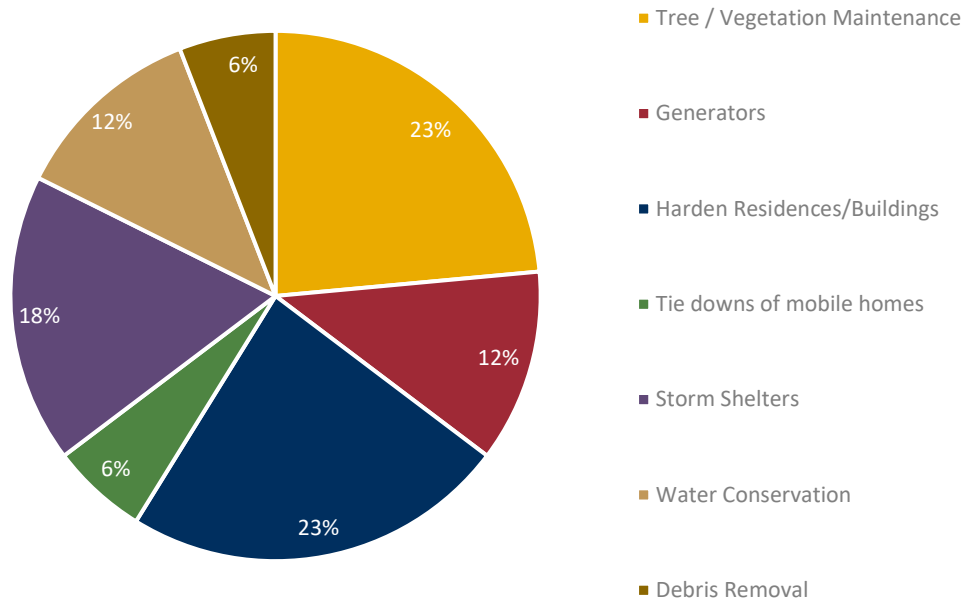


12. Have you taken any actions to make your home or neighborhood more resistant to hazards?

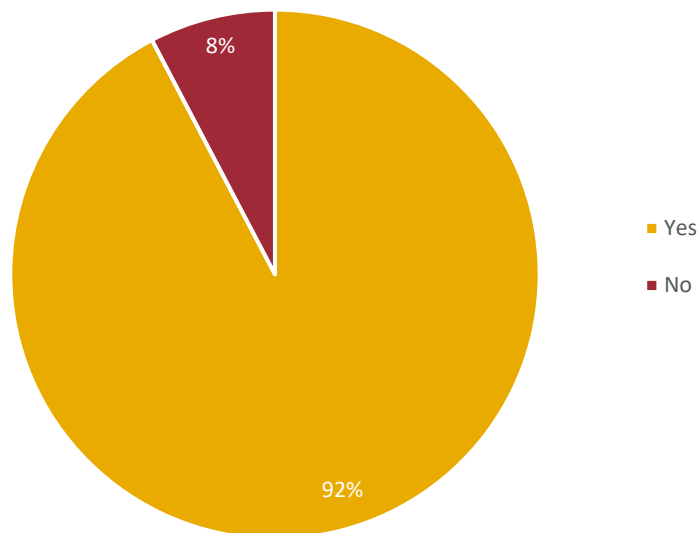


APPENDIX B: PUBLIC SURVEY RESULTS

13. If you answered “Yes” to Question #12, please explain.

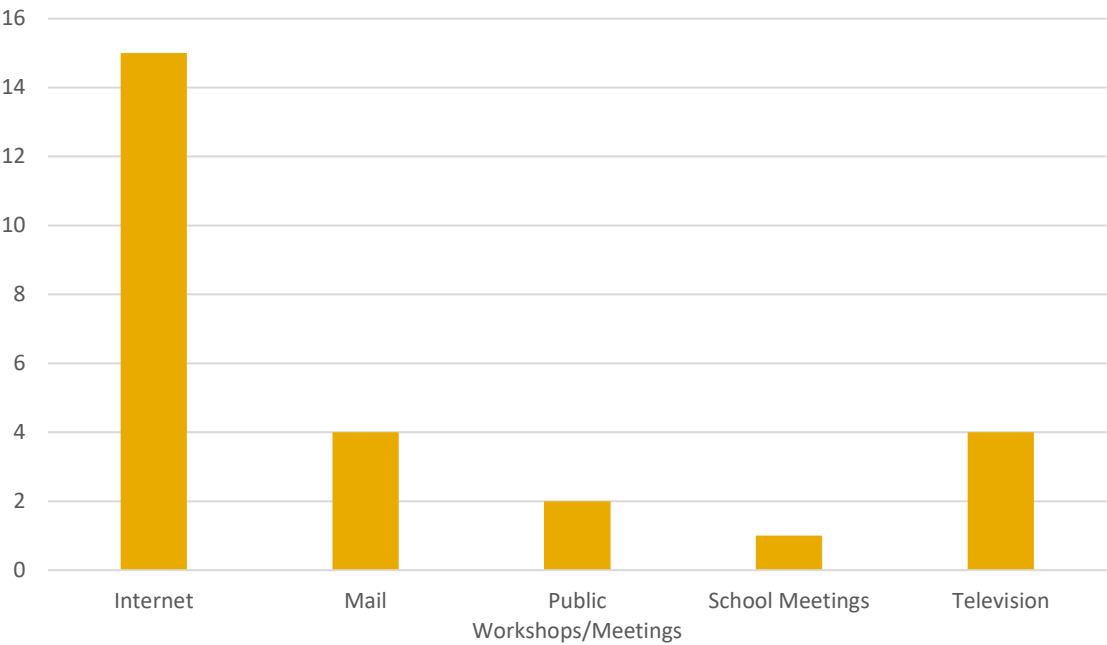


14. Are you interested in making your home or neighborhood more resistant to hazards?



APPENDIX B: PUBLIC SURVEY RESULTS

15. What is the most effective way for you to receive information about how to make your home and neighborhood more resistant to hazards?

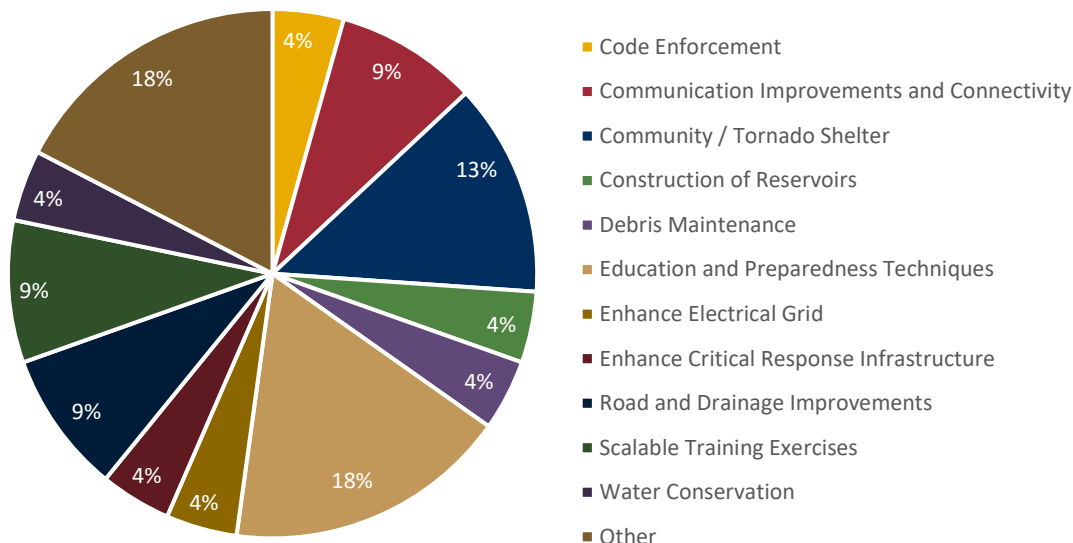


16. If you answered “Other” to Question #15, please explain.

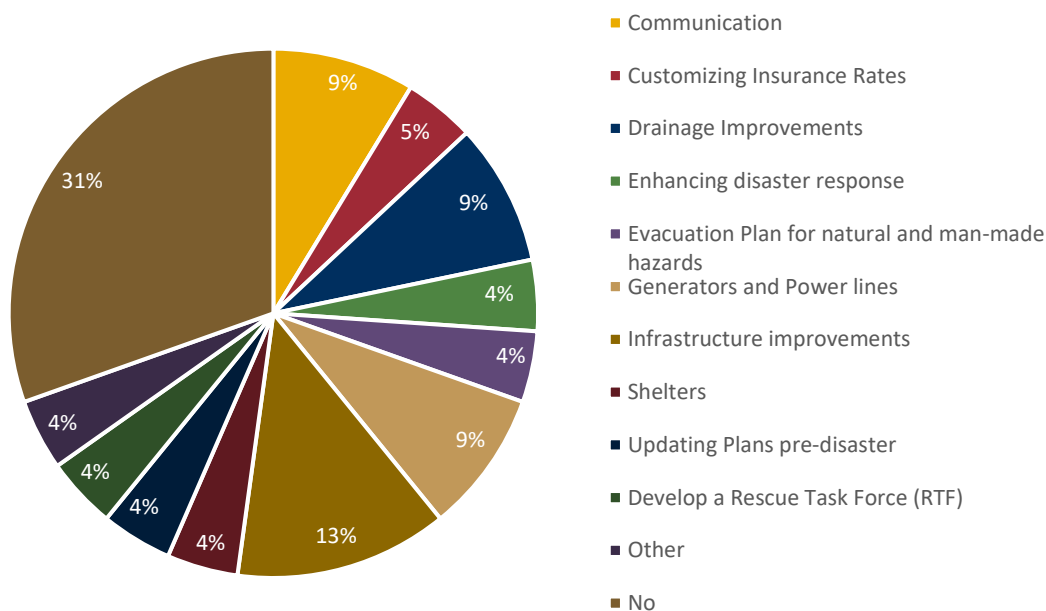
■ No responses

APPENDIX B: PUBLIC SURVEY RESULTS

17. In your opinion, what are some steps your local government could take to reduce or eliminate the risk of future hazard damages in your neighborhood?

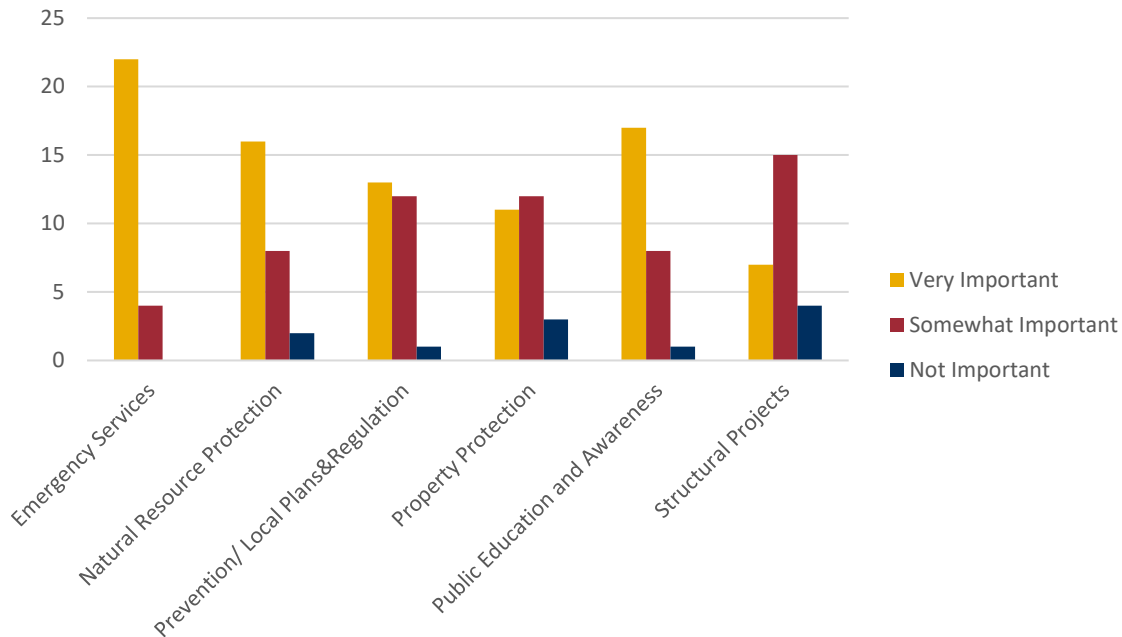


18. Are there any other issues regarding the reduction of risk and loss associated with hazards or disaster in the community that you think are important?



APPENDIX B: PUBLIC SURVEY RESULTS

19. A number of community-wide activities can reduce our risk from hazards. In general, these activities fall into one of the following six broad categories. Please tell us how important you think each one is for your community to consider pursuing.



Emergency Services - Actions that protect people and property during and immediately after a hazard event. Examples include warning systems, evacuation planning, emergency response training, and protection of critical facilities or systems.

Natural Resource Protection - Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. Examples include floodplain protection, habitat preservation, slope stabilization, riparian buffers, and forest management.

Prevention / Local Plans & Regulations - Administrative or regulatory actions that influence the way land is developed and buildings are built. Examples include planning and zoning, building codes, open space preservation, and floodplain regulations.

Property Protection - Actions that involve the modification of existing buildings to protect them from a hazard or removal from the hazard area. Examples include acquisition, relocation, elevation, structural retrofits, and storm shutters.

Public Education and Awareness - Actions to inform citizens about hazards and techniques they can use to protect themselves and their property. Examples include outreach projects, school education programs, library materials, and demonstration events.

Structural Projects - Actions intended to lessen the impact of a hazard by modifying the natural progression of the hazard. Examples include dams, levees, seawalls detention / retention basins, channel modification, retaining walls, and storm sewers.



APPENDIX C

CRITICAL FACILITIES

APPENDIX C: CRITICAL FACILITIES

Appendix C is For **Official Use Only (FOUO)** and may be exempt from public release under the Freedom of Information Act (FOIA).



APPENDIX D DAM LOCATIONS

APPENDIX D: DAM LOCATIONS

Appendix D is **For Official Use Only (FOUO)** and may be exempt from public release under the Freedom of Information Act (FOIA).

A photograph of a cityscape with various brick and concrete buildings, trees, and parked cars under a clear blue sky. The image is partially obscured by a dark blue gradient at the bottom where the text is located.

APPENDIX E MEETING DOCUMENTATION

APPENDIX E: MEETING DOCUMENTATION

Appendix E is **For Official Use Only (FOUO)** and may be exempt from public release under the Freedom of Information Act (FOIA).



APPENDIX F CAPABILITY ASSESSMENT

APPENDIX F: CAPABILITY ASSESSMENT

Appendix F is For **Official Use Only (FOUO)** and may be exempt from public release under the Freedom of Information Act (FOIA).



APPENDIX G STATE AND FEDERAL FUNDING OPPORTUNITIES

APPENDIX G: STATE AND FEDERAL FUNDING OPPORTUNITIES

Overview..... 1

OVERVIEW

Texas utilizes state funds to improve statewide hazard mitigation capabilities and advance their hazard mitigation goals to help identify, understand, and manage various risks associated with natural hazards. State funds also provide funding for state facility and infrastructure upgrades, hazard mapping, mitigation planning, and other mitigation programmatic activities. Table G-1 describes a variety of loan and grant programs offered by state agencies for which mitigation activities may be eligible.

Table G-1. Summary of State Funded Mitigation Programs

AGENCY	FUNDING PROGRAM
Texas A&M Forest Service (TAMFS)	<ul style="list-style-type: none"> Community Fire Protection Program Community Wildfire Defense Grant Fire-Adapted Communities Program (FAC) Firewise USA Program Mitigation Project Support Fund Forest Land Enhancement Program Forest Legacy Program Prescribed Fire Grants Resilient Landscapes Program Rural Fire Assistance Grant State Fire Assistance for Mitigation (SFAM) - Mechanical Fuels Grants SFAM Vegetative Fuel Break Grant Texas Longleaf Conservation Assistance Program Urban Tree Canopy Project (UTC)
Texas Commission on Environmental Quality (TCEQ)	<ul style="list-style-type: none"> Clean Water Act Section 319 Grants Nonpoint Source Grant Program High Hazard Potential Dam Program (HHPD) U.S.-Mexico Border Water Infrastructure Program
Texas Department of Agriculture (TDA)	<ul style="list-style-type: none"> Agricultural Management Assistance (AMA) Agricultural Water Enhancement Program (AWEP) Community Development Block Grant Community Development Block Grant for Rural Texas Conservation Innovation Grants (CIG) Environmental Quality Incentives Program (EQUIP)
Texas Department of Housing and Community Affairs (TDHCA)	<ul style="list-style-type: none"> Texas HOME Disaster Relief
Texas Department of State Health Services (TXDSHS)	<ul style="list-style-type: none"> Hospital Preparedness Program (HPP) Cooperative Agreement Public Health Emergency Preparedness (PHEP) Cooperative Agreement

APPENDIX G: STATE AND FEDERAL FUNDING OPPORTUNITIES

AGENCY	FUNDING PROGRAM
Texas Department of Transportation (TXDOT)	<ul style="list-style-type: none"> • Bridge Preventative Maintenance Program • Emergency Relief (ER) Program • Highway Bridge Replacement and Rehabilitation Program • Safe Rest Stops Program • Transportation Enhancement Program
Texas Division of Emergency Management (TDEM)	<ul style="list-style-type: none"> • Building Resilient Infrastructure & Communities (BRIC) • Emergency Management Performance Grant (EMPG) • Fire Management Assistance Grants (FMAG) • Hazard Mitigation Planning Grants Program (HMGP) • Homeland Security Grant Program (HSGP) • Individual Assistance (IA) • National Earthquake Hazard Reduction Program (NEHRP) • Public Assistance (PA) Section 406 Funds
Texas Economic Development & Tourism (EDT)	<ul style="list-style-type: none"> • Economic Development Administration Grants and Investments
Texas General Land Office (TXGLO)	<ul style="list-style-type: none"> • Beach Grants • Beach Maintenance Reimbursement Fund • Coastal Erosion Planning and Response Act (CEPRA) • Coastal and Estuarine Land Conservation Program (CELCP) • Coastal Management Program (CMP) • Community Development Block Grant – Disaster Recovery (CDBG-DR) • Community Development Block Grant – Mitigation (CDBG-MIT) • Gulf of Mexico Energy Security Act (GOMESA) • Hazard Mitigation Grant Program Supplemental - LHMPP
Texas Parks and Wildlife Department (TPWD)	<ul style="list-style-type: none"> • Nation Resources Damage Assessment (NRDA) • National Wildlife Wetland Refuge System • North American Wetland Conservation Fund • Partners for Fish and Wildlife • Texas Farm and Ranch Lands Conservation Program (TFRLCP) • Wildlife Habitat Incentive Program (WHIP)
Texas State Soil and Water Conservation Board (TSSWCB)	<ul style="list-style-type: none"> • Clean Water Act Section 319 Grants • Nonpoint Source Grant Program
Texas Water Development Board (TWDB)	<ul style="list-style-type: none"> • Agricultural Water Conservation Grants • Agricultural Water Conservation Loans • Clean Water State Revolving Fund (SWSRF) • Community Assistance Program (CAP) • Drinking Water State Revolving Fund (DWSRF) • Economically Distressed Areas Program

APPENDIX G: STATE AND FEDERAL FUNDING OPPORTUNITIES

AGENCY	FUNDING PROGRAM
	<ul style="list-style-type: none"> Emergency Community Water Assistance Grants Flood Infrastructure Fund (FIF) Flood Mitigation Assistance (FMA) Program Flood Protection Planning Program Groundwater Conservation District Loan Program Planning Assistance to States Regional Facility Planning Grant Program Regional Water Planning Group Grants Research and Planning Fund and Fund Development program Risk MAP Program Rural Development Grants Rural Water Assistance Fund Silver Jackets Small Flood Control Projects (USACE Section 205) State Participation Program – Regional Water and Wastewater Facilities State Water Implementation Fund for Texas (SWIFT) State Water Resources Research Act Program Texas Infrastructure Resiliency Fund (TIRF) Water Research Grant Program Water SMART - Drought Response Program Texas Water Development Fund (DFund)

In addition to State-funded programs, many local jurisdictions benefit from federal mitigation funding opportunities. FEMA'S Hazard Mitigation Assistance is a primary source for the implementation of mitigation projects throughout the nation. Table G-2 described additional federal, state, local, and non-profit mitigation funding sources specifically within the State of Texas.

Table G-2. Federal, State, Local and Non-Profit Mitigation Funding Sources in Texas

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Agricultural Management Assistance (AMA)	Federal	USDA, NRCS	TDA	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)	Federal	USDA, NRCS	TDA	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.

APPENDIX G: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Agricultural Water Conservation Grants	State	TWDB	TWDB	Provided to state agencies and political subdivisions for projects that support the implementation of conservation of water management strategies identified in state and regional water plans. Yearly applications. Up to \$1.2 million available annually. Grant categories vary from year to year.
Agricultural Water Conservation Loans	State	TWDB	TWDB	Agricultural water conservation loans to use either for improvements on facilities or as loan to individuals. Low-interest, fixed rates. Up to 10-year repayment terms. U.S. Iron and Steel requirements apply to certain projects. Eligible Loan applicants include political subdivisions.
AmeriCorps - Corporation for National & Community Service (CNCS)	Federal	AmeriCorps	N/A	Provides funding for volunteers to serve communities, including disaster prevention. AmeriCorps/Vista has assisted local communities with wildfire mitigation projects.
American Recovery and Reinvestment Act (ARRA)	Federal	DOT Federal Transit Administration	TDA	Nicknamed the Recovery Act was a stimulus package enacted by the 111th U.S. Congress and signed into law by President Barack Obama in February 2009. Developed in response to the Great Recession, the primary objective of this federal statute was to save existing jobs and create new ones as soon as possible. Other objectives were to provide temporary relief programs for those most affected by the recession and invest in infrastructure, education, health, and renewable energy.
Assistance to Firefighters program - Fire Prevention & Safety (FP&S) Grants	Federal	FEMA, AFG		Fire Prevention & Safety (FP&S) Grants support projects that enhance the safety of the public and firefighters from fire and related hazards.
Beach Grants	Federal	EPA	TXGLO	EPA awards grants under authority of the BEACH Act to eligible states, territories, and tribes with beaches on ocean and Great Lakes coasts to develop and implement programs to monitor their beaches and notify the public when it is not safe to swim.

APPENDIX G: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Beach Maintenance Reimbursement Fund	State	GLO	TXGLO	Allocates approximately \$750,000 per year to help communities keep their beaches maintained. Applications are distributed to eligible participants in early fall and are due within a specified amount of time, no less than 30 days. Contracts are renewable annually.
Bridge Preventative Maintenance Program	State	TXDOT	TXDOT	A planned, cost-effective treatment that preserves, improves, or delays future deterioration of the condition of a bridge. To be eligible for the BMIP a bridge must have a condition rating of 5 or 6 for at least one of the following: deck, superstructure, substructure, culvert, or channel. Safety and improvement to the physical conditions of the State's on-system bridges are TxDOT's main goals in the prioritization of the bridges using BMIP funds. The Bridge Division develops an initial list each FY of eligible bridges in each district and distribute to the districts for the annual program call.
Building Resilient Infrastructure & Communities (BRIC)	Federal	FEMA	TDEM	Pre-disaster/annual cycle addressing all natural hazards, emphasis on infrastructure & lifelines.
Clean Water Act Section 319 Grants	Federal	EPA	TCEQ and TSSWCB	Provides grants for a wide variety of activities related to non-point source pollution runoff mitigation.
Clean Water State Revolving Fund (CWSRF)	Federal	EPA	TWDB	Providing low-cost financing for a wide range of wastewater, stormwater, reuse, and other pollution control projects.
Coastal Erosion Planning and Response Act (CEPRA)	State	GLO	TXGLO	Since 2000, the Texas General Land Office's Coastal Erosion Planning and Response Program has received more than \$62 million in state funding and more than \$62 million in matching funds, completing more than 200 coastal erosion projects and studies. The application process for non-emergency project funding requests opens every even year in February and closes in early June of that same year.

APPENDIX G: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Coastal and Estuarine Land Conservation Program (CELCP)	Federal	NOAA	TXGLO	When NOAA provides funding for CELCP, the GLO provides coastal communities an opportunity to apply for up to three projects per year, with federal grants for any single project not to exceed \$3 million.
Coastal Management Program (CMP)	Federal	NOAA	TXGLO	Texas receives approximately \$2 million annually in grants from National Oceanic and Atmospheric Administration (NOAA) and 90% of the funds are passed through to local governments and entities to address environmental needs and promote sustainable economic development along the coast. Projects must improve the management of the state's coastal resources and ensure long-term ecological and economic productivity. Section 306 administrative funds can be used for non- construction, coastal planning and education, and research. Section 306A improvement funds can be utilized for construction and land acquisition projects and preservation and restoration. CMP funding categories include Coastal Natural Hazards Response, Critical Areas Enhancement, Public Access, Water/Sediment Quantity and Quality Improvements, Waterfront Revitalization and Ecotourism Development, Permit Streamlining/ Assistance, Governmental Coordination and Local Government Planning Assistance.
Community Assistance Program (CAP)	Federal	FEMA, NFIP	TWDB	Product-oriented financial assistance program directly related to the flood loss reduction objectives of the NFIP.
Community Development Block Grant	Federal	HUD	TDA	The primary objective 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. Eligible applicants are non-entitlement cities under 50,000 in population and non-entitlement counties that have a non-metropolitan population under 200,000 and are not eligible for direct CDBG funding from HUD may apply for funding through any of the Texas CDBG programs.

APPENDIX G: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Community Development Block Grant for Rural Texas	State	TDA	TDA	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. Eligible applicants are non-entitlement cities under 50,000 in population and non-entitlement counties that have a non-metropolitan population under 200,000 and are not eligible for direct CDBG funding from HUD may apply for funding through any of the Texas CDBG programs.
Community Development Block Grant – Disaster Recovery (CDBG-DR)	Federal	HUD	TXGLO	Often following a disaster, the state may receive a CDBG-DR Supplement intended for mitigation and disaster recovery projects in the affected areas. Funding can be used to acquire properties in hazard prone areas. Since CDBG funds lose their federal identify they can also be used to supplement state or local match requirements on other funds such as FEMA HMA grants. Funding also supports public facilities including water and wastewater.
Community Development Block Grant – Mitigation (CDBG-MIT)	Federal	HUD	TXGLO	Eligible grantees to use this assistance in areas impacted by recent disasters to carry out strategic and high-impact activities to mitigate disaster risks and reduce future losses. In February of 2018, Congress appropriated \$12 billion dollars in Community Development Block Grant (CDBG) funds specifically for mitigation activities for qualifying disasters in 2015, 2016, and 2017. HUD was able to allocate an additional \$3.9 billion, bringing the amount available for mitigation to nearly \$16 billion.
Community Fire Protection Program	Federal	USDA	TAMFS	Mitigation delivered via USDA Forest Service and Private Forestry Coop Fire Program.
Community Wildfire Defense Grant	Federal	USFS	TAMFS	Offers financial assistance to at-risk local communities with planning for and mitigating against the risk of catastrophic wildfire. This program is authorized in Public Law 117-58, the Infrastructure Investment and Jobs Act.

APPENDIX G: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
				Two primary objectives: The development and revision of Community Wildfire Protection Plans (CWPP), and the implementation of projects described in a CWPP that is less than ten years old. Prioritizes at-risk communities that are in an area identified as having high or very high wildfire hazard potential, are low-income, and/or have been impacted by a severe disaster. No minimum federal funding limit for projects.
Conservation Innovation Grants (CIG)	Federal	USDA, NRCS	TDA	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.
Drinking Water State Revolving Fund (DWSRF)	Federal	EPA	TWDB	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.
Economic Development Administration Grants and Investments	Federal	U.S. DOC, EDA	EDT	Invests and provides grants for community construction projects, including mitigation activities.
Economically Distressed Areas Program	State	TWDB	TWDB	Provides financial assistance for projects serving economically distressed areas where water or sewer services do not exist, or systems do not meet minimum state standards. Eligible EDAP applicants include cities, counties, water districts, nonprofit water supply corporations, and all other political subdivisions. The city or county where the project is located must adopt and enforce Model Subdivision Rules for the regulation of subdivisions prior to application for financial assistance. Projects must also be in an economically distressed area where the median household income is not greater than 75 percent of the median state household income.

APPENDIX G: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Emergency Community Water Assistance Grants	Federal	USDA	TWDB	\$150,000 to \$500,000 available to rural communities with populations over 10,000 people with a median household income less than \$65,900. Aids communities who have experienced a decline in quantity or quality of drinking water as a result of an emergency including drought.
Emergency Relief (ER) Program	Federal	US DOT - FHWA	TXDOT	Provides funds for roads and bridges on Federal-aid highways that are damaged as a direct result of a natural disaster or catastrophic failure from an external cause.
Emergency Watershed Protection (EWP)	Federal	USDA, NRCS	TWDB	Provides funding and technical assistance for emergency measures such as floodplain easements in impaired watersheds. Funding available through the Simplified Acquisition Procedures (SAP) ranges from \$25K to \$100K. Funded through contracts between project sponsors and the NRCS. There are no grants. The NRCS pays 75% of the costs.
Environmental Quality Incentives Program (EQUIP)	Federal	USDA, NRCS	TDA	Provides funding and technical assistance to farmers and ranchers to promote agricultural production and environmental quality as compatible goals.
Fire-Adapted Communities Program (FAC)	Federal	FEMA, USFA	TAMFS	Collaborates to identify its wildfire risk and works collectively on actionable steps to reduce its risk of loss. This work protects property and increases the safety of firefighters and residents.
Fire Management Assistance Grants (FMAG)	Federal	FEMA	TDEM	Provides fire suppression support to states when loss of life and property are imminent. Wildfire mitigation is also eligible under emergency protection if life is in imminent danger.
Firewise USA Program	Federal	USDA, DOI, NASFF, NFPA	TAMFS	The national Firewise USA® recognition program provides a collaborative framework to help neighbors in a geographic area get organized, find direction, and take action to increase the ignition resistance of their homes and community and to reduce wildfire risks at the local level.
Flood Infrastructure Fund (FIF)	State	TWDB	TWDB	Enacted through Senate Bill 7 to address needs identified following the flood disasters of 2015, 2016, and 2017. Senate Bill 500 appropriated \$793 million. The purpose is to provide loans and grants for flood activities and projects. Once the

APPENDIX G: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
				State Flood Plan is adopted, the account may only be used for projects included in the plan. The SWIFT Advisory Committee is the oversight entity.
Flood Mitigation Assistance Program (FMA)	Federal	FEMA	TWDB	Repetitive flood loss property reduction and projects that mitigate losses to NFIP insured properties.
Flood Protection Planning Program	State	TWDB	TWDB	Developed to evaluate solutions to flooding problems in the state of Texas.
Forest Land Enhancement Program	Federal	USDA, NRCS	TAMFS	Provides educational, technical, and financial assistance to help landowners implement sustainable forestry management objectives.
Forest Legacy Program	Federal	USFS	TAMFS	Program providing funding to protect private forest lands that are environmentally, economically, and socially critical. This program reduces development in the wildland-urban interface.
Hazard Mitigation Grant Program (HMGP)	Federal	FEMA	TDEM	Post-disaster multi-hazard mitigation funding for federally declared disasters. HMGP Post Fire funds are available for FMAG declarations.
Hazard Mitigation Grant Program Supplemental – Local Hazard Mitigation Plan Program (LHMPP)	Federal	FEMA	TXGLO	Local Hazard Mitigation Plan Program (LHMPP) assists eligible entities by providing grants to develop or update local hazard mitigation plans, or to provide cost share for hazard mitigation planning activities funded through other federal sources. Community Development Block Grant Mitigation (CDBG-MIT) funds allocated by the United States Department of Housing and Urban Development (HUD) and administered by the Texas General Land Office (GLO) fund these planning activities, and the Hazard Mitigation Plan development and approval oversight is administered by the Federal Emergency Management Agency (FEMA) and administered by the Texas Division of Emergency Management (TDEM Grant awards will range from \$20,000 – \$100,000.

APPENDIX G: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
High Hazard Potential Dam Program (HHPD)	Federal	FEMA	TCEQ	Pre-disaster/annual cycle, for non-federal high hazard dams rated Unsatisfactory. Local match is 35% for each of the four grant periods.
Highway Bridge Replacement and Rehabilitation Program	Federal	FHWA	TXDOT	Provides funding to enable states to improve the condition of highway bridges through replacement, rehabilitation, and systematic preventive maintenance. Also includes the National Historic Covered Bridge Preservation Program.
Homeland Security Grant Program (HSGP)	Federal	DHS	TDEM	Homeland security activities identified in the state and local strategic plans. Funding supports threat & hazard and risk identification for natural, technological, and human-caused hazards. Some prevention activities may be considered mitigation.
Hospital Preparedness Program (HPP) Cooperative Agreement	Federal	HHS	TXDSHS	HPP is the primary source of federal funding for health care system preparedness and response and, in collaboration with public health, prepares health care delivery systems to save lives through the development of health care coalitions (HCCs). Under the direction of the HPP providers, the HCCs develop plans and provide training, and coordinate regional exercises.
Hydrologic Research Grants	Federal	NOAA		Up to \$125,000 to conduct joint research and development on pressing surface water hydrology issues common to national, regional, local operational offices. Eligible applicants are federally recognized agencies of state or local governments, quasi-public institutions such as water supply or power companies, hydrologic consultants and companies involved in using and developing hydrologic forecasts.
Groundwater Conservation District Loan Program	State	TWDB	TWDB	Provides short-term loans to finance the start-up costs of Groundwater Conservation Districts. Funding is available for any Groundwater District or Authority with the authority to regulate the spacing of water wells, the production from water wells, or both. The program is authorized under Texas Water Code Chap. 36, Subchapter. L, and governed by TWDB rules in 31 Tex. Admin. Code Chap. 363, Subchapter. H.

APPENDIX G: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Gulf of Mexico Energy Security Act (GOMESA)	Federal	DOI	TXGLO	GOMESA significantly enhances oil and gas leasing activities and creates revenue sharing provisions for the oil- and gas-producing states of Alabama, Louisiana, Mississippi, and Texas, and their coastal political subdivisions (CPSs). GOMESA funds are used for coastal conservation, restoration, and hurricane protection. The second phase of GOMESA revenue sharing began in Fiscal Year 2017 and expands the definition of qualified Outer Continental Shelf revenues to include receipts from Gulf of Mexico leases subject to withdrawal or moratoria restrictions. A revenue-sharing cap of \$500 million per year for the four Gulf producing states, their CPSs and the Land and Water Conservation Fund applies from fiscal years 2016 through 2055.
Individual Assistance (IA)	Federal	FEMA	TDEM	Following a disaster, funds can be used to mitigate hazards when repairing individual and family homes.
In-Lieu Fee Program Mitigation Projects	Federal	USACE	Community Applicants	Restoration, establishment, enhancement, and/or preservation of aquatic resources through funds paid to a governmental or non-profit natural resources management entity to satisfy compensatory mitigation requirements for Department of the Army permits.
Mitigation Banks	Federal	USACE	Community Applicants	Mitigation Banks are sites approved by the Corps to sell compensatory mitigation credits for projects resulting in unavoidable impacts to waters of the U.S. When a permit is issued that requires compensatory mitigation, the permit will specify how many credits are required to be purchased at an approved mitigation bank.
National Earthquake Hazards Reduction Program (NEHRP)	Federal	FEMA	TDEM	Provides money to support enhanced earthquake risk assessments in local hazard mitigation plans and other earthquake hazard mitigation and preparedness activities.
Natural Resources Damage Assessment (NRDA)	Federal	EPA	TPWD	Ecological Risk Assessments (ERAs) evaluate the likelihood that adverse ecological effects are occurring or may occur as a result of exposure to physical stressors (e.g., cleanup activities) or

APPENDIX G: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
				chemical stressors (e.g., release of hazardous substances) at a site.
National Weather Service (NWS)	Federal	NOAA - NWS		NWS offers storm spotter training, along with weather and flooding safety guides. They can also sometimes provide funding to support severe weather signage in parks or other public places.
National Wildlife Wetland Refuge System	Federal	USFWS	TPWD	Provides funding for the acquisition of lands into the federal wildlife refuge system.
Nonpoint Source Grant Program	Federal	EPA	TCEQ, TSSWCB	The federal Clean Water Act (CWA) requires States to develop a program to protect the quality of water resources from the adverse effects of nonpoint source (NPS) water pollution. TCEQ and TSSWCB administer federal grants for activities that prevent or reduce nonpoint source pollution (NPS).
North American Wetland Conservation Fund	Federal	USFWS	TPWD	Provides funding for wetland conservation projects.
NRCS Conservation Programs	Federal	USDA, NRCS	Community Applicants	Provides funding through several programs for the conservation of natural resources.
Partners for Fish and Wildlife	Federal	USFWS	TPWD	Provides financial and technical assistance to landowners for wetland restoration projects in “Focus Areas” of the state.
Planning Assistance to States	Federal	USACE	TWDB	Aids states in planning for the development, utilization, and conservation of water and related land resources.
Pre-Disaster Mitigation Loan Program	Federal	SBA		Provides low-interest loans to small businesses for mitigation projects.
Prescribed Fire Grants	State	TAMFS	TAMFS	TAMFS’s Mitigation & Prevention Department annually implements four prescribed fire grants intended to protect local communities and restore ecosystems. (1) SFAM Plains Prescribed Fire Grant – aids communities that have been or may be threatened by wildland fire by funding prescribed burning to reduce hazardous fuels

APPENDIX G: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
				<p>in or around communities. Treatment areas will be located adjacent to priority communities in Texas that are at the highest risk for loss during a Southern Plains Wildfire Outbreak event.</p> <p>(2) The Community Protection Program Grant aids reducing the hazard of high-risk fuels on private lands through the use of prescribed burning. The treatment area will be within 10 miles of a National Forest boundary. The grant's goal is to protect high-risk communities and associated forest resources by reducing the risk of catastrophic wildfire on private and public lands.</p> <p>(3) The State Fire Assistance for Mitigation Central & East Texas Grant provides assistance to communities that have been or may be threatened by wildfire by funding prescribed burning to reduce hazardous fuels in and around communities. Treatment areas will be private property in the 43 Counties in Central and East Texas that have a Community Wildfire Protection Plan within the county. The goal is to protect high-risk communities and aid in ecosystem restoration by utilizing prescribed fire to consume excess vegetation before it contributes to catastrophic wildfire. Priority will be given to treatments sites that are within a CWPP, located near a Firewise community, located near homes based on Texas Wildfire Risk Assessment Portal and contain ecosystems that will benefit from prescribed fire.</p> <p>(4) Neches River and Cypress Basin Watershed Restoration Program - Prescribed Fire Grant provides assistance to landowners in utilizing prescribed fire for ecological improvement to the Neches River and Cypress Basin watersheds. This program will benefit the public and natural resources through improvement of water quality and quantity, control of invasive species and enhancement of wildlife habitat. Treatment areas will be private property in the Neches River and Cypress Basin Watersheds. Priority will be given to prescribed burn treatments that</p>

APPENDIX G: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
				promote native ecosystem restoration, are in priority watershed protection zones and near public land.
Public Assistance (PA) Section 406 Funds	Federal	FEMA	TDEM	Following a disaster, funds can be used to mitigate hazards when repairing damages to a public structure or infrastructure. Wildfire mitigation is also eligible under emergency protection if life is in imminent danger.
Public Health Emergency Preparedness (PHEP) Cooperative Agreement	Federal	CDC	TXDSHS	Helps health departments build and strengthen their abilities to effectively respond to a range of public health threats, including infectious diseases, natural disasters, and biological, chemical, nuclear, and radiological events. Preparedness activities funded by the PHEP cooperative agreement specifically target the development of emergency-ready public health departments that are flexible and adaptable.
Regional Facility Planning Grant Program	State	TWDB	TWDB	TWDB grants to political subdivisions of the State of Texas for studies and analyses to evaluate and determine the most feasible alternatives to meet regional water supply and wastewater facility needs, estimate the costs associated with implementing feasible regional water supply and wastewater facility alternatives, and identify institutional arrangements to provide regional water supply and wastewater services for areas in Texas.
Regional Water Planning Group Grants	State	TWDB	TWDB	Developed to guide and support planning of the state's water resources by administering and assisting in the development of the regional and state water plans. The department strives to improve the planning process each cycle by developing clear guidance for the program's stakeholders and utilizing best-available data, methodologies, and technical innovations.
Research and Planning Fund and Fund Development Program	State	TWDB	TWDB	Offers grants to eligible applicants for the development or revision of regional water plans. The proposed planning must be a plan, an amendment to an approved regional water plan developed by the regional water planning group for a regional water planning area pursuant to the Texas Water Code, §16.053 and Chapter 357, or other special studies approved by the TWDB which will enhance water planning efforts in the

APPENDIX G: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
				region. Activities eligible for funding are those related to the development, revision, or improvement of regional water plans including public meetings, hearings, and special studies.
Resilient Landscapes Program	Federal	USDA, USFS	TAMFS	The USFS is working with partners to restore healthy, resilient, fire-adapted ecosystems. Restoring ecosystems includes thinning crowded forests and using prescribed fire on two to three million acres each year, which can help prevent the buildup of flammable vegetation that feeds extreme wildfires.
Risk MAP Program	Federal	FEMA, NFIP	TWDB	Establishes or updates floodplain mapping and multi-hazard risk products.
Rural Development Grants	Federal	USDA-Rural Development	TWDB	Provides grants and loans for infrastructure and public safety development and enhancement in rural areas. Provides \$100,000 or 75% of the total project, whichever is less.
Rural Fire Assistance Grant	Federal	NIFC	TAMFS	Funds fire mitigation activities in rural communities.
Rural Utilities Service (RUS)	Federal	USDA-Rural Development		RUS administers programs that provide much-needed infrastructure or infrastructure improvements to rural communities. These include water and waste treatment, electric power, and telecommunications services.
Rural Water Assistance Fund	State	TWDB	TWDB	Designed to assist small rural utilities to obtain low-cost financing for water and wastewater projects. The RWAF offers tax-exempt equivalent interest rate loans with long-term finance options.
Safe Rest Stops Program	State	TXDOT	TXDOT	Texas has 21 major highways that serve as long distance travel corridors. Along each of these roadways, rest areas are an essential safety feature to reduce accidents caused by driver fatigue. These facilities give travelers a break from driving, and then return them to the road rested, refreshed and alert.
State Fire Assistance for Mitigation (SFAM) -	State	TAMFS	TAMFS	Provides financial assistance to reduce the hazard of high-risk fuels on private lands using hazardous fuel reduction. The grant's goal is protected high risk communities within the 32 high risk counties in Central Texas identified by

APPENDIX G: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Mechanical Fuels Grants				Texas A&M Forest Service Mitigation and Prevention Department. Priority will be given to landowners that live with in the 32 high risk counties, are in a county or city that has an active Community Wildfire Protection plan or live with in a Firewise USA Site.
SFAM Vegetative Fuel Break Grant	State	TAMFS	TAMFS	Provides financial assistance for the creation of vegetative fuel breaks on private lands in Texas. Vegetative fuel breaks are trees and shrubs systematically planted adjacent to fields, homesteads, or feedlots to reduce or redirect the wind. Projects will be in the Texas High Plains. The goal of the grant is to protect high-risk communities by reducing the risk of catastrophic wildfire on private and public lands. Grant recipients will be reimbursed up to \$2,500 for actual costs associated with creating a green, vegetative fuel break, consisting of a minimum of 3 rows of trees and 400 feet in length.
Silver Jackets	Federal	USACE	TWDB	Can provide funding for flood related studies, public awareness, risk analysis, and flood response plans. Construction of small flood control projects.
Small Flood Control Projects (USACE Section 205)	Federal	USACE	TWDB	Authorizes use of USACE to do feasibility and construction of small flood control projects.
State Participation Program – Regional Water and Wastewater Facilities	State	TWDB	TWDB	The State Participation Program enables the TWDB to provide funding and assume a temporary ownership interest in a regional water, wastewater, or flood control project when the local sponsors are unable to assume debt for an optimally sized facility. The program is intended to encourage the optimum regional development of projects by funding excess capacity for future use where the benefits can be documented, and where such development is unaffordable without state participation. The goal is to allow for the "right sizing" of projects in consideration of future needs.
State Water Implementation	State	TWDB	TWDB	Passed by the Legislature and approved by Texas voters through a constitutional amendment, the SWIFT program helps

APPENDIX G: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Fund for Texas (SWIFT)				communities develop and optimize water supplies at cost-effective rates. The program provides low-interest loans, extended repayment terms, deferral of loan repayments, and incremental repurchase terms for projects with state ownership aspects.
State Water Resources Research Act Program	Federal	USGS	TWDB	USGS in cooperation with the National Institutes for Water Resources supports an annual call for proposals to focus on water problems and issues that are of a regional or interstate nature or relate to a specific program priority identified by the Secretary of the Interior and the Institutes.
Texas Farm and Ranch Lands Conservation Program (TFRLCP)	State	TPWD	TPWD	Maintains and enhances the ecological and agricultural productivity of these lands through Agricultural Conservation Easements. The TFRLCP supports responsible stewardship and conservation of working lands, water, fish and wildlife, and agricultural production through: <ul style="list-style-type: none"> Generating interest and awareness in easement programs and other options for conserving working lands. Leveraging available monies to fund as many high-quality projects as possible. Highlighting the ecological and economic value of working lands and the opportunities to conserve working lands for the future.
Texas HOME Disaster Relief	Federal	TDHCA	TDHCA	The Texas HOME Disaster Relief Program is a long-term housing program designed to help eligible organizations serve income eligible households impacted by disasters. Funds are available to assist with federal or state declared disasters, or other natural or man-made disasters that may occur. The Department's practice is to maintain a HOME Disaster Relief Fund balance of \$1 million whenever possible. These funds can be accessed to support impacted households not located in communities that receive HOME funds directly from the U.S. Department of Housing and Urban Development (HUD).
Texas Longleaf Conservation Assistance Program	Federal	National Fish and Wildlife Foundation (NFWF)	TAMFS	Provides eligible landowners with financial and technical assistance for establishing, enhancing, and managing longleaf pine. Landowners with property within ten East Texas counties which

APPENDIX G: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
				include Angelina, Hardin, Jasper, Nacogdoches, Newton, Polk, San Augustine, Sabine, San Jacinto, Trinity, and Tyler are eligible to apply. Approved participants may receive up to 50% payment not to exceed a standard cap rate for implementing approved conservation practices. Approved conservation practices include prescribed burning, reforestation, site preparation, and forest stand improvement.
Texas Infrastructure Resiliency Fund (TIRF)	State	TWDB	TWDB	Enacted through Senate Bill 7 to address needs identified following the flood disasters of 2015, 2016, and 2017. Senate Bill 500 appropriated \$685 million. Purpose is to provide loans, grants, and matching funds for flood projects through four separate accounts. Each account has different purposes. The oversight entity is the TIRF Advisory Board (SWIFT Advisory Committee and TDEM Director as non-voting member).
Texas Water Development Fund (DFund)	State	TWDB	TWDB	State funded loan program The DFund enables the Board to fund multiple eligible components in one loan to our borrowers, e.g., an application for funding of water and wastewater components can be processed in a single loan. Provide financial assistance for water supply projects, wastewater projects, and flood control projects (including structural and nonstructural flood protection improvements).
Transportation Enhancement Program	Federal	FHWA	TXDOT	Provides opportunities for non-traditional transportation related activities. Projects should go above and beyond standard transportation activities and be integrated into the surrounding environment in a sensitive and creative manner that contributes to the livelihood of the communities, promotes the quality of our environment, and enhances the aesthetics of our roadways. Projects undertaken with enhancement funds are eligible for reimbursement of up to 80 percent of allowable costs.
United States Geological Survey (USGS)	Federal	USGS		USGS issues competitive grants and cooperative agreements to support research in earthquake hazards, the physics of earthquakes, earthquake occurrence, and earthquake safety policy.

APPENDIX G: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
Urban Tree Canopy Project (UTC)	Federal	USDA, USFS	TAMFS	Urban tree canopy (UTC) is the layer of leaves, branches, and stems of trees that cover the ground when viewed from above. In urban areas, the UTC provides an important stormwater management function by intercepting rainfall that would otherwise run off of paved surfaces and be transported into local waters through the storm drainage system, picking up various pollutants along the way. UTC also reduces the urban heat island effect, reduces heating/cooling costs, lowers air temperatures, reduces air pollution, increases property values, provides wildlife habitat, and provides aesthetic and community benefits such as improved quality of life.
U.S.-Mexico Border Water Infrastructure Program	Federal	EPA	TCEQ	Provides grant assistance to U.S. and Mexican communities located within 60 miles of the border for the development and construction of high-priority drinking water and wastewater facilities. The program furthers EPA's mission of protecting human health and the environment by providing critical resources for what is often an area's first drinking water and basic sanitation services.
Water Research Grant Program	State	TWDB	TWDB	TWDB funds a variety of water planning and water research studies and projects intended to assist and support regional water planning efforts or to answer regional water planning questions.
Water Conservation Field Services Program	Federal	HUD	Texas A&M AgriLife	Provides several grants related to safe housing initiatives.
Water2025 Challenge Grant Program for Western States	Federal	Bureau of Reclamation	TWDB	Up to \$25,000 for projects that improve water use efficiency and improve water management practices.
Watershed Processes and Water Resources	Federal	Bureau of Reclamation	TWDB	Up to \$250,000 for projects that can be completed within 24 months and that reduce conflicts through water conservation, efficiency, and markets.
Watershed Processes and Water Resources –	Federal	USDA	TWDB	\$100,000 available. Sponsors research that addresses two areas: (1) understanding fundamental watershed processes; and (2) developing appropriate technology and

APPENDIX G: STATE AND FEDERAL FUNDING OPPORTUNITIES

NAME	LEVEL	SOURCE AGENCY	MANAGING STATE AGENCY	PURPOSE OF FUNDING
National Research Initiative Standard Research (Part T)				management practices for improving the effective use of water (consumptive and non-consumptive) and protecting or improving water quality for agriculture and forestry production.
WaterSMART – Drought Response Program	Federal	USDA	TWDB	\$500,000 available. Innovative research in understanding fundamental processes that affect the quality and quantity of water resources at diverse spatial and temporal scales, ways on improving water resource management in agriculture, forested, and rangeland watersheds, and developing appropriate technology to reach those goals.
Wildlife Habitat Incentive Program (WHIP)	Federal	USDA, NRCS	TPWD	Voluntary program for conservation-minded landowners who want to develop and improve wildlife habitat on agricultural land, nonindustrial private forest land, and tribal land.



RESOLUTION FOR COUNTY OF WICHITA APPROVAL OF HAZARD MITIGATION PLAN

WHEREAS, natural hazards in Wichita County, Texas, historically have caused significant disasters with losses of life and property and natural resources damage; and

WHEREAS, the Federal Disaster Mitigation Act of 2000 and Federal Emergency Management Agency (FEMA) require communities to adopt a hazard mitigation action plan to be eligible for the full range of pre-disaster and post-disaster federal funding for mitigation purposes; and

WHEREAS, FEMA requires that communities update Hazard Mitigation Action Plans every five years in order to be eligible for the full range of pre-disaster and post-disaster federal funding for mitigation purposes; and

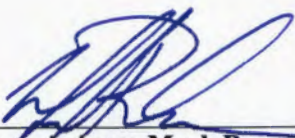
WHEREAS, the County of Wichita has assessed the community's potential risks and hazards and is committed to planning for a sustainable community and reducing the long-term consequences of natural and man-caused hazards; and

WHEREAS, the Wichita County Hazard Mitigation Plan outlines a mitigation vision, goals and objectives; assesses risk from a range of hazards; and identifies risk reduction strategies and actions for hazards that threaten the community.

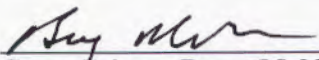
NOW THEREFORE BE IT RESOLVED THAT:

1. The Wichita County Hazard Mitigation Plan is approved in its entirety;
2. The County of Wichita will pursue available funding opportunities for implementation of the proposals designated therein, and will, upon receipt of such funding or other necessary resources, seek to implement the actions contained in the mitigation strategies;
3. The County of Wichita vests with the County Judge the responsibility, authority, and means to inform all parties of this action; assure that the Hazard Mitigation Plan will be reviewed at least annually; and that any needed adjustments will be presented to the County Commissioners for consideration; and
4. The County of Wichita agrees to take such other action as may be reasonably necessary to carry out the objectives of the Plan and report on progress as required by FEMA and the Texas Division of Emergency Management (TDEM).

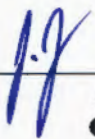
ADOPTED this 25th day of June, 2024.



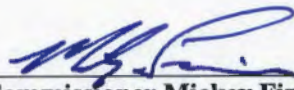
Commissioner Mark Beauchamp
Precinct 1



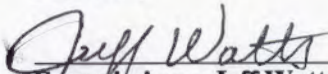
Commissioner Barry Mahler
Precinct 3



Jim Johnson
County Judge

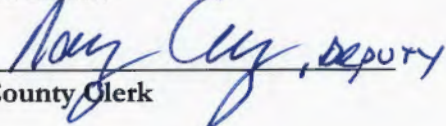


Commissioner Mickey Fincannon
Precinct 2



Commissioner Jeff Watts
Precinct 4

ATTEST:



County Clerk

RESOLUTION NUMBER 757

A RESOLUTION OF THE BOARD OF COMMISSIONERS OF THE CITY OF BURKBURNETT, TEXAS AUTHORIZING THE APPROVAL OF THE WICHITA COUNTY HAZARD MITIGATION PLAN.

WHEREAS, the Wichita County Hazard Mitigation Plan is more than just another planning document. It is a record of the community's potential risks and hazards, and commitment to reducing the long-term consequences of those hazards. The mitigation plan outlines goals within a community, identifies risk reduction strategies for hazards that threaten the area, and discusses the ongoing risk reduction activities undertaken within the jurisdiction; and

WHEREAS, the Disaster Mitigation Act of 2000 and the Federal Emergency Management Agency (FEMA) requires an update of the Hazard Mitigation Plan every five years to ensure consideration of continued federal funding in times of disasters; and

WHEREAS, Wichita County Emergency Management was tasked with the preparation of the County-wide Mitigation Action Plan; and

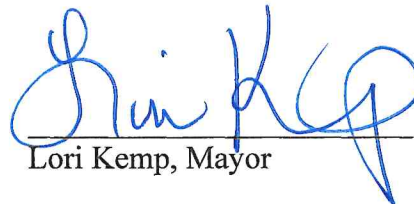
WHEREAS, the Wichita County Hazard Mitigation Plan includes the following communities: the unincorporated areas of Wichita County, the City of Burkburnett, the City of Cashion, the City of Electra, the City of Iowa Park, and the Town of Pleasant Valley;

NOW, THEREFORE BE IT RESOLVED, by the Board of Commissioners of the City of Burkburnett, Texas:

Section 1. The approval of the Wichita County Hazard Mitigation Plan in its entirety.

Section 2. The City of Burkburnett to take such other action as may be reasonably necessary to carry out the objectives of the Plan and report on progress as required by FEMA and the Texas Division of Emergency Management (TDEM).

PASSED AND APPROVED at a meeting of the Board of Commissioners of the City of Burkburnett, Texas on this 15th day of July 2024.


Lori Kemp, Mayor

ATTEST:


Nikki Tepfer, City Clerk

RESOLUTION FOR CITY OF CASHION COMMUNITY

APPROVAL OF HAZARD MITIGATION PLAN

WHEREAS, natural hazards in the City of Cashion Community area historically have caused significant disasters with losses of life and property and natural resources damage; and

WHEREAS, the Federal Disaster Mitigation Act of 2000 and Federal Emergency Management Agency (FEMA) require communities to adopt a hazard mitigation action plan to be eligible for the full range of pre-disaster and post-disaster federal funding for mitigation purposes; and

WHEREAS, FEMA requires that communities update hazard mitigation action plans every five years in order to be eligible for the full range of pre-disaster and post-disaster federal funding for mitigation purposes; and

WHEREAS, the City of Cashion Community has assessed the community's potential risks and hazards and is committed to planning for a sustainable community and reducing the long-term consequences of natural and man-caused hazards; and

WHEREAS, the Wichita County Hazard Mitigation Plan outlines a mitigation vision, goals and objectives; assesses risk from a range of hazards; and identifies risk reduction strategies and actions for hazards that threaten the community.

NOW THEREFORE BE IT RESOLVED THAT:

1. The Wichita County Hazard Mitigation Plan is approved in its entirety;
2. The City of Cashion Community will pursue available funding opportunities for implementation of the proposals designated therein, and will, upon receipt of such funding or other necessary resources, seek to implement the actions contained in the mitigation strategies;
3. The City of Cashion Community vests with the Mayor the responsibility, authority, and means to inform all parties of this action; assure that the Hazard Mitigation Plan will be reviewed at least annually; and that any needed adjustments will be presented to the City Council for consideration; and
4. The City of Cashion Community to take such other action as may be reasonably necessary to carry out the objectives of the Plan and report on progress as required by FEMA and the Texas Division of Emergency Management (TDEM).

ADOPTED this 8th day of July 2024.

Rubra Carr
(Mayor)

Doris J. Chilton
(Clerk)

RESOLUTION FOR CITY OF ELECTRA

NUMBER 2024-04

APPROVAL OF HAZARD MITIGATION PLAN

WHEREAS, natural hazards in the City of Electra area historically have caused significant disasters with losses of life and property and natural resources damage; and

WHEREAS, the Federal Disaster Mitigation Act of 2000 and Federal Emergency Management Agency (FEMA) require communities to adopt a hazard mitigation action plan to be eligible for the full range of pre-disaster and post-disaster federal funding for mitigation purposes; and

WHEREAS, FEMA requires that communities update hazard mitigation action plans every five years in order to be eligible for the full range of pre-disaster and post-disaster federal funding for mitigation purposes; and


WHEREAS, the City of Electra has assessed the community's potential risks and hazards and is committed to planning for a sustainable community and reducing the long-term consequences of natural and man-caused hazards; and

WHEREAS, the Wichita County Hazard Mitigation Plan outlines a mitigation vision, goals and objectives; assesses risk from a range of hazards; and identifies risk reduction strategies and actions for hazards that threaten the community.

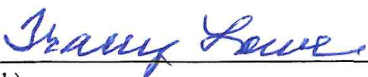
NOW THEREFORE BE IT RESOLVED THAT:

1. The Wichita County Hazard Mitigation Plan is approved in its entirety;
2. The City of Electra will pursue available funding opportunities for implementation of the proposals designated therein, and will, upon receipt of such funding or other necessary resources, seek to implement the actions contained in the mitigation strategies;
3. The City of Electra vests with the Mayor the responsibility, authority, and means to inform all parties of this action; assure that the Hazard Mitigation Plan will be reviewed at least annually; and that any needed adjustments will be presented to the City Council for consideration; and
4. The City of Electra to take such other action as may be reasonably necessary to carry out the objectives of the Plan and report on progress as required by FEMA and the Texas Division of Emergency Management (TDEM).

ADOPTED this 23rd day of July, 2024.



(Mayor)



(Clerk)

Resolution No. 24-08

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF IOWA PARK, TEXAS
APPROVING AND ADOPTING THE WICHITA COUNTY HAZARD MITIGATION PLAN.

- WHEREAS, natural hazards in the City of Iowa Park area historically have caused significant disasters with losses of life and property and natural resources damage; and
- WHEREAS, the Federal Disaster Mitigation Act of 2000 and Federal Emergency Management Agency (FEMA) require communities to adopt a hazard mitigation action plan to be eligible for the full range of pre-disaster and post-disaster federal funding for mitigation purposes; and
- WHEREAS, FEMA requires that communities update hazard mitigation action plans every five years in order to be eligible for the full range of pre-disaster and post-disaster federal funding for mitigation purposes; and
- WHEREAS, the City of Iowa Park has assessed the community's potential risks and hazards and is committed to planning for a sustainable community and reducing the long-term consequences of natural and man-caused hazards; and
- WHEREAS, the Wichita County Hazard Mitigation Plan outlines a mitigation vision, goals and objectives; assesses risk from a range of hazards; and identifies risk reduction strategies and actions for hazards that threaten the community.

NOW THEREFORE BE IT RESOLVED THAT:

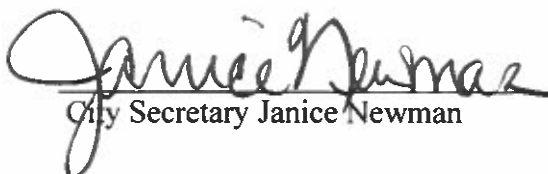
1. The Wichita County Hazard Mitigation Plan is approved in its entirety.
2. The City of Iowa Park will pursue available funding opportunities for implementation of the proposals designated therein, and will, upon receipt of such funding or other necessary resources, seek to implement the actions contained in the mitigation strategies.
3. The City of Iowa Park vests with the Mayor the responsibility, authority, and means to inform all parties of this action; assure that the Hazard Mitigation Plan will be reviewed at least annually; and that any needed adjustments will be presented to the City Council for consideration.
4. The City of Iowa Park to take such other action as may be reasonably necessary to carry out the objectives of the Plan and report on progress as required by FEMA and the Texas Division of Emergency Management (TDEM).

PASSED, APPROVED AND ADOPTED this 8th day of July, 2024.

ATTEST:



Mayor Jeff Pogatschnik



City Secretary Janice Newman

RESOLUTION FOR CITY OF PLEASANT VALLEY

APPROVAL OF HAZARD MITIGATION PLAN

WHEREAS, natural hazards in the City of Pleasant Valley area historically have caused significant disasters with losses of life and property and natural resources damage; and

WHEREAS, the Federal Disaster Mitigation Act of 2000 and Federal Emergency Management Agency (FEMA) require communities to adopt a hazard mitigation action plan to be eligible for the full range of pre-disaster and post-disaster federal funding for mitigation purposes; and

WHEREAS, FEMA requires that communities update hazard mitigation action plans every five years in order to be eligible for the full range of pre-disaster and post-disaster federal funding for mitigation purposes; and

WHEREAS, the City of Pleasant Valley has assessed the community's potential risks and hazards and is committed to planning for a sustainable community and reducing the long-term consequences of natural and man-caused hazards; and

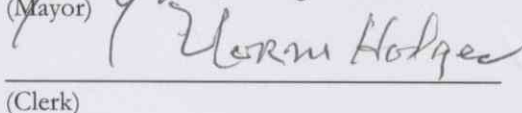
WHEREAS, the Wichita County Hazard Mitigation Plan outlines a mitigation vision, goals and objectives; assesses risk from a range of hazards; and identifies risk reduction strategies and actions for hazards that threaten the community.

NOW THEREFORE BE IT RESOLVED THAT:

1. The Wichita County Hazard Mitigation Plan is approved in its entirety;
2. The City of Pleasant Valley will pursue available funding opportunities for implementation of the proposals designated therein, and will, upon receipt of such funding or other necessary resources, seek to implement the actions contained in the mitigation strategies;
3. The City of Pleasant Valley vests with the Mayor the responsibility, authority, and means to inform all parties of this action; assure that the Hazard Mitigation Plan will be reviewed at least annually; and that any needed adjustments will be presented to the City Council for consideration; and
4. The City of Pleasant Valley to take such other action as may be reasonably necessary to carry out the objectives of the Plan and report on progress as required by FEMA and the Texas Division of Emergency Management (TDEM).

ADOPTED this 1 day of July 2024.


(Mayor)


(Clerk)

Resolution No. 77-2024

Resolution authorizing the City of Wichita Falls to adopt the Wichita County Hazard Mitigation Action Plan to ensure the City continues to mitigate and reduce the overall damage caused by disasters that will impact the City of Wichita Falls

WHEREAS, natural hazards in the City of Wichita Falls area historically have caused significant disasters with losses of life and property and natural resources damage; and

WHEREAS, the Federal Disaster Mitigation Act of 2000 and Federal Emergency Management Agency (FEMA) require communities update hazard mitigation action plans every five years in order to be eligible for the full range of pre-disaster and post-disaster federal funding for mitigation purposes; and

WHEREAS, the City of Wichita Falls has assessed the community's potential risks and hazards and is committed to planning for a sustainable community and reducing the long-term consequences of natural and man-caused hazards; and

WHEREAS, the Wichita County Hazard Mitigation Plan outlines a mitigation vision, goals, and objectives; assesses risk from a range of hazards; and identifies risk reduction strategies and actions for hazards that threaten the community.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF WICHITA FALLS, TEXAS, THAT:

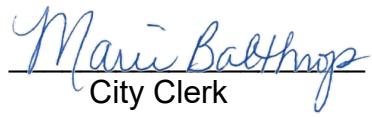
1. The Wichita County Hazard Mitigation Plan is approved in its entirety;
2. The City of Wichita Falls will pursue available funding opportunities for implementation of the proposals designated therein, and will, upon receipt of such funding or other necessary resources, seek to implement the actions contained in the mitigation strategies;
3. The City of Wichita Falls vests with the Mayor the responsibility, authority, and means to inform all parties of this action; assure that the Hazard Mitigation Plan will be review at least annually; and that any needed adjustments will be presented to City Council for consideration; and
4. The City of Wichita Falls to take such other action as may be reasonably necessary to carry out the objectives of the Plan and report on progress as required by FEMA and the Texas Division of Emergency Management (TDEM).

PASSED AND APPROVED this the 16th day of July, 2024.



MAYOR

ATTEST:



City Clerk