BROWN COUNTY

HAZARD MITIGATION ACTION PLAN

BROWN COUNTY	BANGS	BLANKET
BROWNWOOD	EARLY	BROOKESMITH ISD

PREDICT, PREPARE, PROTECT: SAFETY IN EVERY STEP

PREPARED FOR: BROWN COUNTY
OFFICE OF EMERGENCY MANAGEMENT
200 S. BROADWAY, SUITE 114, BROWNWOOD, TX 76801

PREPARED BY: WEST CENTRAL TEXAS COUNCIL OF GOVERNMENTS
HOMELAND SECURITY DEPARTMENT
3702 LOOP 322, ABILENE, TX, 79602

2025

June 2, 2025 (Exhibit #8)

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U.S. Department of Homeland Security
FEMA Region 6
800 N. Loop 288
Denton, TX 76209

FEMA

May 15, 2025

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

RE: Approvable Pending Adoption of the Brown County, Texas Multi-Jurisdiction Hazard Mitigation Plan

Dear Ms. 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). FEMA review does not include the review of content that exceeds the applicable FEMA mitigation planning requirements. Formal approval of this plan is contingent upon the adoption by the participants on Enclosure A, as well as the receipt of the final draft of the plan containing all plan components.

Adopting resolutions must be submitted to this agency for review and approval no later than one year from the date of this letter. Failure to submit these resolutions in a timely manner could lead to a required update of the plan prior to FEMA approval.

Once this final requirement has been met, a letter of official approval will be generated. The Local Hazard Mitigation Planning Tool, with the reviewer's comments, has been enclosed to further assist the jurisdictions in complying with planning requirements. If you have any questions, please contact David Freeborn, HM Community Planner, at (940) 268-7602.

Sincerely,

Ronald C. Wanhanen
Chief, Risk Analysis Branch

Enclosures: Participants

cc: Anne Lehnick

Adoption Submittal (Final)

Following the issuance this of Approvable Pending Adoption letter, all participants are provided one year to adopt the plan and submit it through the State to FEMA. For multi-jurisdictional plans, multiple adoptions should be submitted as a complete package as outlined below.

The State must submit the plan files via:

Risk Management Directorate (RMD) SharePoint:

https://rmd.msc.fema.gov/Regions/VI/Mitigation%20Planning/Forms/AllItems.aspx

Note: You will be requested to register if you have not already done so. All plans containing Protected Critical Infrastructure Information (PCII) must be submitted as an encrypted document with the password being sent separately in an email to ensure secure file submissions.

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1. Final draft of the plan in MS Word or pdf format containing:
   a. The final plan formatted as a single document.
   b. Documentation demonstrating adoption by the participating jurisdictions seeking approval. (i.e. copies of signed resolutions, official meeting minutes, etc....) Note: Adoption resolutions can be separate files. Additional adoptions are not required to provide a copy of the plan.
   c. Remove strikethroughs, highlights and all Track Changes must be accepted in the final plan.

2. Send an email addressed to r6-mtd-planning@fema.dhs.gov as notification that the electronic file has been submitted. Please DO NOT send plans to the email inbox as it has very strict size limitations which will lock the inbox and not allow additional emails to be received. The email must include the following information:

   a. Include the follow when applicable: (Note: A submittal letter is no longer required.)
      i. Subject line [Approval Review for Name of Plan, State]
      ii. FEMA funding source, grant or disaster number, and project number (when applic
      iii. list of adopting jurisdictions
      iv. Plan File name (file name must include date submitted)

3. Submittals which do not conform to the above requirements will be returned to the State for resubmission

Participants

Attached is the list of participating local governments included in the May 15, 2025 review of the referenced Hazard Mitigation plan.

Community Name
1) Bangs city
2) Blanket town
3) Brookesmith Independent School District
4) Brown County
5) Brownwood city
6) Early city

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SECTION 1: INTRODUCTION

Background

The West Central Texas Council of Governments (WCTCOG) is a special district promoting regional planning and cooperation among local governments and districts across 19 counties. The WCTCOG Homeland Security Department (HSD) enhances regional preparedness and resilience against threats by implementing antiterrorism measures, reducing hazard vulnerability, and minimizing damage while aiding recovery. They achieve these goals through hazard mitigation planning, emergency preparedness, and coordination with federal, state, local governments, and the private sector.

The Disaster Mitigation Act (DMA) of 2000, updated in January 2008, mandates that state, tribal, and local governments develop mitigation plans to qualify for Federal Emergency Management Agency (FEMA) hazard mitigation grants. According to Title 44 Code of Federal Regulations (CFR) Part 201.6(d), these plans must be reviewed, potentially revised, and resubmitted for FEMA approval every five years to maintain grant eligibility[1]. To help local governments maintain hazard mitigation grant eligibility, the WCTCOG developed the 2025 Hazard Mitigation Action Plan (HMAP) in collaboration with all participating jurisdictions.

Texas faces various natural hazards, including extreme heat, flooding, drought, hail, and winter storms, which can damage property, disrupt the economy, and reduce quality of life. While these events cannot be prevented, their impacts can be mitigated. Hazard mitigation, as defined by FEMA, involves sustained actions to reduce or eliminate long-term risks to people and property from hazards and their effects[2].

Hazard mitigation activities are crucial for community safety and sustainability, with the most effective measures implemented at the local government level, where development regulation and control decisions are made. Comprehensive HMAP reviews address current and future hazard vulnerabilities, making it essential to identify how future development will affect a community's overall hazard vulnerability. The DMA of 2000 requires plans to be initially reviewed by the State Hazard Mitigation Officer within the Texas Division of Emergency Management (TDEM). CFR 201.6(d) mandates regional review and approval by FEMA before jurisdictional adoption and implementation.

Scope

The scope of the HMAP update is to identify activities to mitigate hazards classified as "high" or "moderate" risk, as determined through a detailed hazard risk assessment. The hazard classification enables the participating county and jurisdictions to prioritize mitigation actions and develop a mitigation strategy that addresses the greatest threats to lives and property. Some information contained in this HMAP is exempt from public release under the Freedom of Information Act (FOIA) and will be redacted for public use.

Purpose

The primary goal of the HMAP is to minimize disaster response and recovery costs by protecting lives and property. This planning process allows participating jurisdictions, stakeholders, and the public to evaluate and develop effective hazard mitigation actions to reduce future risks of loss of life and property damage from disasters. The specific goals of the HMAP are to:

- ✓ Minimize disruption to participating jurisdictions within county following a disaster.
- ✓ Streamline disaster recovery by outlining pre-disaster actions to reduce or eliminate future damage.
- ✓ Demonstrate a strong local commitment to hazard mitigation principles.
- ✓ Serve as a basis for future funding opportunities through state or federal grant and technical assistance programs, enabling participating jurisdictions to take advantage of emerging mitigation grant opportunities.
- ✓ Ensure that participating jurisdictions maintain eligibility for the full range of future federal disaster relief.

Authority

The HMAP adheres to all requirements set forth by TDEM and complies with the relevant provisions of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Section 104 of the DMA of 2000, and the Bunning-Bereuter-Blumenauer (BBB) Flood Insurance Reform Act of 2004, which amended the National Flood Insurance Act (NFIA) of 1968. Additionally, the HMAP

FEMA

[1] https://www.ecfr.gov/current/title-44/chapter-I/subchapter-D/part-201

[2] http://www.fema.gov/hazard-mitigation-planning-resources

meets the criteria specified in the Hazard Mitigation Planning and Hazard Mitigation Grant Program (44 CFR, Part 201), which outline the approval requirements for mitigation plans as mandated by Section 322 of the DMA 2000. It also aligns with the standards in the FEMA Local Mitigation Planning Policy Guide (April 2022) and the Local Mitigation Planning Handbook (May 2023). The HMAP incorporates guidance from the National Flood Insurance Program (NFIP), the Community Rating System (CRS), and the 2023 Texas State Hazard Mitigation Plan provided by TDEM. This plan is independently tailored to the participating jurisdictions with contributions from planning team members, stakeholders, and the public while respecting the principles underlying the above frameworks.

Summary of Sections

- ✓ Sections 1 and 2:
  Brief introduction and discussion of the planning process, including plan preparation and development, review and incorporation of existing plans, timeline for implementing mitigation actions, and public and stakeholder involvement.

- ✓ Section 3:
  Overview of the jurisdiction(s), including population and demographics, population growth, future development, economic impact, and existing and future land use and development trends, if applicable.

- ✓ Section 4:
  Overview of the risk and vulnerability assessment, including the definition of risk and methodology, significant events since the last HMAP update, hazard identification, community assets, and the risk analysis and assessment matrix.

- ✓ Section 5:
  Overview of the capability assessment, including the purpose, the types and evaluation of capabilities, integration with existing plans and local processes, and capability needs and challenges.

- ✓ Section 6:
  Hazard profiles of identified natural, technological, and human caused hazards addressed in the HMAP.

- ✓ Section 7:
  Mitigation strategy, including the goals of the county, the participating jurisdictions, and the public. Methodology used for the development and update of mitigation strategies and actions.

- ✓ Section 8:
  Action plan developed by the county and participating jurisdictions.

- ✓ Section 9:
  HMAP maintenance, including the evaluation and assessment of the mitigation strategy and actions.

- ✓ Section 10:
  References utilized in the development of the HMAP.

- ✓ Section 11:
  Appendices applicable to planning, updates, and adoption. See the Table of Contents for additional information or page numbers[3].

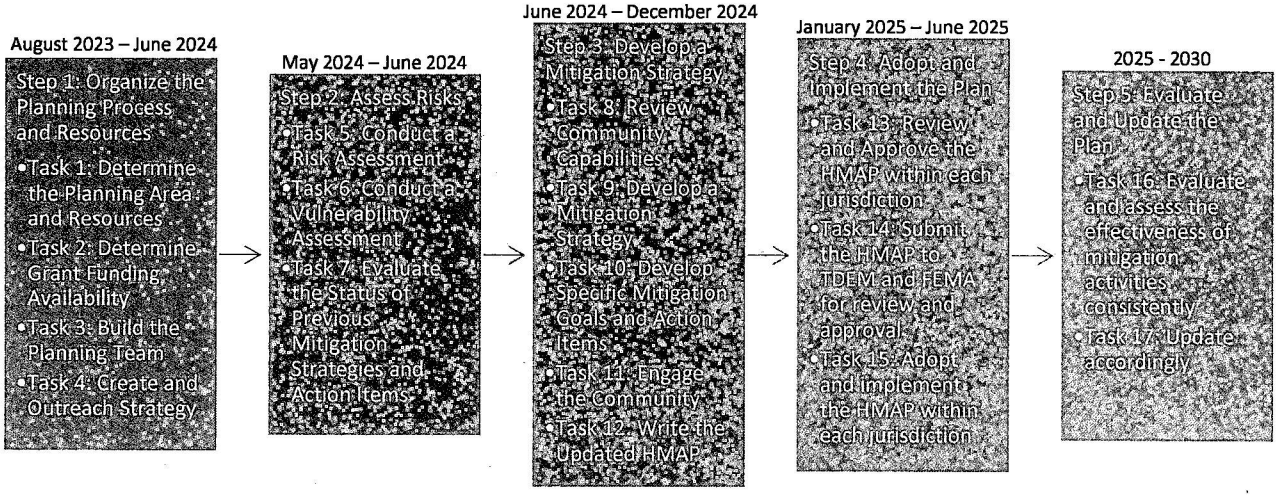
[3] Information contained in some of these sections and appendices are exempt from public release under the Freedom of Information Act (FOIA).

SECTION 2: PLANNING PROCESS

44 CFR REQUIREMENT
Requirement 44 CFR § 201.6(c)(1) The planning process is documented and includes how it was prepared and who was involved in the process for each jurisdiction.
Requirement 44 CFR § 201.6(c)(1) The plan documents how the plan was prepared, including the schedule or time frame and activities that made up the plan's development, as well as who was involved.
Requirement 44 CFR § 201.6(b)(2) The plan lists the jurisdictions participating the plan that seek approval and describes how they participated in the planning process.

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. The overall planning process is an opportunity for Brown County, the participating jurisdictions, stakeholders, and the public to evaluate and develop successful hazard mitigation actions to reduce future risk of loss of life and damage to property resulting from a disaster in Brown County. WCTCOG, Brown County, and participating jurisdictions met in June 2024 to begin organizing resources, identify planning team members, and conducting a risk and capability assessment. Planning team meetings were held from June to September 2024 that consisted of mitigation strategy development, action item development, and public and stakeholder engagement. Plan development, review, and revision occurred from September 2024 to December 2024. Submission to TDEM and FEMA for plan approval was planned to occur in December 2024.

FIGURE 2-1. *Local Mitigation Planning Steps and Tasks*



Participating Jurisdictions

The participating jurisdictions include the county, all incorporated cities, and special districts that expressed interest:

- ✓ Brown County
- ✓ City of Bangs
- ✓ City of Blanket
- ✓ City of Brownwood
- ✓ City of Early
- ✓ Brookesmith Independent School District

Planning Team

44 CFR REQUIREMENT

Requirement 44 CFR § 201.6(b)(2) The plan identifies all stakeholders involved or given an opportunity to be involved in the planning process and how each stakeholder was presented with this opportunity. The plan identifies all stakeholders involved or given an opportunity to be involved in the planning process and how each stakeholder was presented with this opportunity.

The WCTCOG hazard mitigation team developed the HMAP in conjunction with the Brown County executive planning team. The executive planning team was established using a direct representation model to complete capability assessment surveys, provide input regarding the identification of hazards, complete risk assessment surveys, identify mitigation goals, support public involvement strategies, update critical facility inventory, and develop mitigation strategies. An advisory planning team consisted of key personnel from each of the participating jurisdictions within Brown County was developed to provide additional input on threats and hazards, mitigation measures, and previous success stories.

TABLE 2-1. *Executive Planning Team (2024 planning cycle)*

ORGANIZATION	TITLE	ORGANIZATION	TITLE
Brown County	Judge	City of Early	Mayor
Brown County	Emergency Management Coordinator	City of Early	City Administrator
City of Brownwood	Mayor	City of Early	Assistant City Administrator
City of Brownwood	EMC/Fire Chief	City of Early	EMC/Police Chief
City of Brownwood	Deputy EMC/Assistant Fire Chief	City of Early	Fire Chief
City of Brownwood	Public Health Emergency Preparedness	Brookesmith ISD	Superintendent
City of Bangs	Mayor	Brookesmith ISD	Assistant Superintendent
City of Bangs	Mayor Pro-Tem	WCTCOG	EM Program Coordinator
City of Bangs	City Secretary	WCTCOG	Homeland Security Planner
City of Blanket	Mayor	WCTCOG	Hazard Mitigation Program Specialist
City of Blanket	City Secretary		

TABLE 2-2. *Advisory Planning Team (2024 planning cycle)*

ORGANIZATION	TITLE	ORGANIZATION	TITLE
Brown County	Sheriff	City of Bangs	Council Member
Brown County	Surveyor	City of Bangs	Council Member
Brown County	County Clerk	City of Bangs	Council Member
Brown County	Precinct 1 Commissioner	City of Blanket	Council Member
Brown County	Precinct 2 Commissioner	City of Blanket	Council Member
Brown County	Precinct 3 Commissioner	City of Blanket	Council Member
Brown County	Precinct 4 Commissioner	City of Blanket	Council Member
City of Brownwood	Council Member	City of Early	Mayor Pro-Tem
City of Brownwood	Council Member	City of Early	Council Member
City of Brownwood	Council Member	City of Early	Council Member
City of Brownwood	Council Member	City of Early	Council Member
City of Brownwood	Council Member	City of Early	Council Member
City of Bangs	Council Member		

The WCTCOG hazard mitigation team and Brown County planning teams coordinated to identify mitigation goals and develop mitigation strategies and actions for the HMAP via in person, over the phone, and through email communications over the course of several months. Based on results of completed risk and capability assessments, participating jurisdictions within Brown County described methods for achieving future hazard mitigation measures by expanding existing capabilities. For example, options to identify areas for capability improvement could include the following:

- ✓ Establish planning team members with the authority to monitor the HMAP and identify grant funding opportunities for personnel expansion.
- ✓ Identify opportunities for cross-training or increasing the technical expertise of staff by attending free training available through FEMA and/or TDEM.
- ✓ Review current floodplain ordinances for opportunities to increase resiliency through permit or building code modification.
- ✓ Develop ordinances that require all new developments to conform to the highest mitigation standards.

Sample hazard mitigation actions developed with similar hazard risks were shared at meetings. These important discussions resulted in the development of multiple mitigation actions that are included in the HMAP to further mitigate risk from natural, technological, and human-caused hazards in the future. The DMA 2000 and 44 CFR, Part 201 requires jurisdictions to address only natural hazards within the HMAP; however, the WCTCOG and Brown County determined it was in the best interest of Brown County to address all three (3) categories of hazards throughout the risk and capability assessments to determine mitigation needs.

Planning Process

44 CFR REQUIREMENT

Requirement 44 CFR § 201.6(b)(3) The plan documents what existing plans, studies, reports, and technical information were reviewed for the development of the plan as well as how they were incorporated into the development.

Once grant funding was awarded within Step 1 of the planning process and the planning team was developed, the WCTCOG hazard mitigation team identified natural, technological, and human-caused hazards based on historical data from FEMA[4], the United States Army Corps of Engineers (USACE)[5], the U.S. Fire Administration (USFA)[6], National Oceanic and Atmospheric Administration (NOAA)[7], the Texas Water Development Board (TWDB)[8], the Texas Commission on Environmental Quality (TCEQ)[9], the Texas State Data Center (TSDC)[10], Texas Forest Service (TFS)[11], the 2023 Texas State Hazard Mitigation Plan[12], the 2017 Mills County and City of Brownwood Hazard Mitigation Plan, and the 2020 WCTCOG Regional Planning Area Hazard Mitigation Plan Update. Additional databases and resources were researched throughout the planning process as necessary for hazard profiles and strategy development, including but not limited to dam assessments, wildfire risk assessments, regional Threat and Hazard Identification and Risk Assessment, and public opinion. These resources are identified and incorporated within the HMAP where appropriate to support HMAP development.

An initial risk and capability assessment was developed and distributed via survey format to key public officials and stakeholders. Data collection and analysis was presented to the executive planning team at the kick-off workshop for discussion on capability gaps, critical infrastructure concerns, categories of mitigation preferences, status of previous mitigation action items, and levels of low, moderate, and high hazard risks. Hazards, vulnerabilities, and capabilities were identified and discussed at the mitigation strategy workshop. Plan maintenance and implementation procedures were developed and included in Section 8.

Participation of planning team members, stakeholders, and the public throughout the planning process is documented in Appendix B through E. Plan development workshops and meetings throughout the planning process took the following factors into consideration:

- ✓ The nature and magnitude of risks currently affecting the community.
- ✓ Hazard mitigation goals to address current and expected conditions.
- ✓ Evaluation of current resources for HMAP implementation.
- ✓ Implementation and coordination concerns (i.e.. technical, political, legal) that may hinder development.
- ✓ Anticipated outcomes.
- ✓ Capability or willingness of jurisdictions, organizations, and partners to implement the HMAP.

The planning team pursued a gradual, non-disruptive process of hazard mitigation planning to improve existing procedures and processes to increase efficiency and fix deficiencies. It involved plans to update or streamline procedures and incorporate new practices. The planning team further identified the risks associated with the planned changes, estimated the effects on resources, efforts, and schedules, and determined what needs to be modified to accomplish meaningful change.

[4] https://www.fema.gov/flood-maps/products-tools/national-risk-index
[5] https://www.usace.army.mil/
[6] https://www.usfa.fema.gov/index.html
[7] https://www.noaa.gov/
[8] https://www.twdb.texas.gov/
[9] https://www.tceq.texas.gov/
[10] https://demographics.texas.gov/
[11] https://tfsweb.tamu.edu/
[12] https://tdem.texas.gov/mitigation/hazard-mitigation-section

KICKOFF WORKSHOP

The Kickoff Workshop was held at the Brown County Courthouse in Brownwood on June 20, 2024. The initial workshop informed multi-jurisdictional key elected and appointed public officials on the planning process, expected roles, and next steps. The participants discussed the following information:

- ✓ Project overview regarding the planning process.
- ✓ Final identification of planning team members.
- ✓ Public survey access information.
- ✓ Increase risk assessment data.
- ✓ Hazard identification and discussion.
- ✓ Capability assessment survey analysis.
- ✓ Previous mitigation action item status discussion.
- ✓ Potential future mitigation goals and actions.

RISK ASSESSMENT

Prior to the Kickoff Workshop, through e-mail and phone correspondence, the WCTCOG hazard mitigation team conducted a preliminary hazard identification survey. In consideration of a full range of natural, technological, and human-caused hazards documented by TDEM and FEMA, the team narrowed the list to significant hazards by those considered to have greater effect to the region according to research described previously. Following this initial analysis, twelve (12) natural hazards were identified, twelve (12) technological hazards were identified, and seven (7) human-caused hazards were identified which pose a significant threat to the planning area. A risk ranking was conducted of each category. Participants ranked each hazard high to low in terms of perceived level of risk, frequency of past occurrence, likelihood of future occurrence, potential human impact, and potential economic impact.

An initial risk assessment survey for participating jurisdictions within Brown County was completed May through June 2024 and results were presented to key public officials at the Kick-Off Workshop held on June 20, 2024, with additional survey analysis presented to planning team members in July 2024. The mitigation action teams evaluated the characteristics and consequences of each hazard to determine the extent to which the planning area would be affected in terms of potential danger to life and property.

Property and crop damage estimates were available via gathered data from the National Center for Environmental Information (NCEI) and NOAA. These assessments examine the impact of various hazards on the built environment, including general building stock, critical facilities, lifelines, and infrastructure. The resulting risk assessment survey profiled hazard events which provided information on previous occurrences, probability of future events, and human and economic impact. Assessments set priorities for hazard mitigation actions based on potential loss of lives and economic loss. Hazard profiles and vulnerability analysis can be found in Section 4.

MITIGATION REVIEW AND DEVELOPMENT

44 CFR REQUIREMENT

Requirement 44 CFR § 201.6(c)(3)(iii) The plan contains an action plan that describes how the actions identified will be prioritized (including a cost-benefit review), implemented, and administered by each jurisdiction.

An inclusive and structured process was used to develop and prioritize new hazard mitigation actions for the HMAP. The prioritization method was based on FEMA's STAPLE+E criteria which 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, found in Section 7. Planning teams identified the costs and benefits, responsible organization(s), effects on new and existing buildings, implementation schedules, priorities, and potential funding sources for each hazard mitigation action item. Specifically, the process involved:

- ✓ Review of the jurisdiction's capability assessment, the jurisdiction's National Flood Insurance Program compliance table, the jurisdiction's adaptive capacity and/or concern for climate change, the jurisdiction's identified opportunities for future planning integration, jurisdiction-specific vulnerabilities, and public input.

- ✓ 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 the 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 points of contact.

- ✓ Planning teams 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 HMAP, planning teams utilized economic evaluation as a determining factor between hazard mitigation actions.

- ✓ Planning teams reviewed county-wide mitigation recommendations and determined if those actions chosen in the base plan met the needs of the jurisdiction.

- ✓ Planning teams then selected mitigation actions. Action plans that identify each project, who will oversee each task, how it may be financed, and when it is estimated to occur were developed.

- ✓ Planning teams determined the implementation priority and grant pursuit priority of selected mitigation actions.

TABLE 2-3. *Benefit and Cost Ratings*

BENEFIT RATING		COST RATING	
HIGH	Immediate risk reduction for life and property.	HIGH	Inadequate current funding. Requires increased revenue (e.g., bonds, grants, fee increases).
MEDIUM	Long-term impact. Immediate risk reduction.	MEDIUM	Needs budget reapportionment/amendment. Costs spread over multiple years.
LOW	Long-term benefits are difficult to quantify short-term.	LOW	Funding available within the existing budget. Part of or can be integrated into an ongoing program.

TABLE 2-4. *Implementation Prioritization Ratings*

IMPLEMENTATION PRIORITY		GRANT PURSUIT PRIORITY	
HIGH	Meets multiple objectives, benefits exceed costs, funding secured, short-term goal (1-5 years).	HIGH	Meets grant eligibility, high benefits, high/medium priority, no local funding options.
MEDIUM	Meets multiple objectives, benefits exceed costs, eligible for funding but not secured, short-term goal (1-5 years) once funded.	MEDIUM	Meets grant eligibility, low/medium benefits, medium/low priority, no local funding options.
LOW	Mitigates hazard risk, benefits do not exceed costs or are difficult to quantify, no funding secured, not eligible for grants, long-term goal (1-10 years).	LOW	Not eligible for any grant funding.

Hazard mitigation actions identified in this process were made available to the executive planning team for review. The draft mitigation actions were made available to the public by request and provided during public meetings for discussion and input.

INCORPORATION OF EXISTING PLANS INTO THE HMAP PROCESS

44 CFR REQUIREMENT

Requirement 44 CFR § 201.6(b)(3) The plan describes the review and incorporation of existing plans, studies, reports, and technical information.

A Capability Assessment was completed which provided information pertaining to existing plans, policies, codes, ordinances, and regulations currently integrated into or to be integrated into the goals and objectives of the HMAP. The planning team will regularly participate in jurisdictional meetings with planning partners to ensure effective integration of hazard mitigation into future planning activities and mechanisms wherever applicable and appropriate. This work can include:

- ✓ Updating work plans, policies, or procedures to include hazard mitigation concepts.
- ✓ Establishing mitigation funding within capital and operational budgets.
- ✓ Developing guidance on risk-reduction techniques.
- ✓ Issuing plans, policies, regulations, or other directives to carry out mitigation actions.
- ✓ Adding hazard mitigation elements to redevelopment and capital plans.

Existing projects and studies were utilized as a starting point for discussing hazard mitigation actions among the planning and hazard mitigation team members. Policies, ordinances, and other plans were reviewed, such as Emergency Operations Plans and Capital Improvement Plans, to identify any additional mitigation actions. Finally, the 2023 State of Texas Mitigation Plan, developed by TDEM, was discussed in the initial planning meeting to develop a specific selection of hazards to address in the planning process. The 2023 State HMAP was also used as a guidance document, along with FEMA materials, in the development of the Brown County HMAP.

Accomplishments will be documented and integrated into the HMAP planning process to include applicable amendments and updates, as required. The planning team will continue to pursue additional opportunities for integration between the HMAP and other planning mechanisms. The methodology, timelines, and expectations are defined below and in Section 9.

INCORPORATION OF THE HMAP INTO OTHER PLANNING MECHANISMS

44 CFR REQUIREMENT
Requirement 44 CFR § 201.6(c)(4)(ii) The plan describes the process by which each community will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate.
Requirement 44 CFR § 201.6(c)(4)(ii) The plan describes the process the community will follow to integrate the ideas, information, and strategy of the mitigation plan into other planning mechanisms.
Requirement 44 CFR § 201.6(c)(4)(ii) The plan identifies the planning mechanisms for each plan participant into which the ideas, information, and strategy from the mitigation plan may be integrated.
Requirement 44 CFR § 201.6(c)(4)(ii) For multi-jurisdictional plans, the plan describes each participant's individual process for integrating information from the mitigation strategy into their identified planning mechanisms.

Participating jurisdictions within Brown County will be responsible for implementing hazard mitigation actions contained in Section 7 and integrating the hazard mitigation strategy and actions into existing planning mechanisms. These may include storm water management plans and ordinances, emergency operations or management plans, evacuation plans, and other local and area planning efforts. Brown County will work closely with area organizations to coordinate the implementation of hazard mitigation actions that benefit the planning area in terms of financial and economic impact. Each hazard mitigation action item has been assigned to a specific County or City department responsible for tracking and implementing the action, utilizing the applicable funding source within the given timeframe.

Brown County participating jurisdictions will work together to advance the goals of the HMAP as it applies to ongoing, long-range planning goals and actions for mitigating risk to natural hazards throughout the county. Section 5 provides an overview of existing planning and regulatory capabilities that support the implementation of mitigation strategy objectives. Section 5 also provides further analysis of how each intends to incorporate hazard mitigation actions into existing plans, policies, and the annual budget review as it pertains to prioritizing grant applications for funding and implementation of identified hazard mitigation projects.

The HMAP has been used as a reference when reviewing and updating plans and ordinances for the county, including all participating jurisdictions, and will continue within future planning mechanisms. The emergency operations plans developed independently by the Brookesmith Independent School District, City of Bangs, City of Blanket, City of Brownwood, City of Early, and Brown County are updated every 5 years and incorporate goals, objectives, and actions identified in the mitigation plan. Each jurisdiction has identified similar individual processes for integration of the mitigation strategy into other plans and planning mechanisms. Examples provided by the jurisdiction are included below.

TABLE 2-5. *Methods of Incorporating Mitigation Actions into Planning Mechanisms*

Planning Mechanism	Incorporation of HMAP
Annual Budget Review	Various departments and key personnel participate in the planning process and review the plan update and mitigation actions. When conducting the annual budget review, allowances will be made in accordance with grant applications sought and mitigation actions will be undertaken, according to the implementation schedule of the specific action.
Capital Improvement Plan	Participating jurisdiction has a Capital Improvement Plan (CIP) in place. Prior to any revisions to the CIP, county and city departments review the risk assessment and mitigation strategy sections of the HMAP, as limiting public spending in hazardous zones are one of the most effective long-term mitigation actions available to local governments.

TABLE 2-5, CONTINUED. *Methods of Incorporating Mitigation Actions into Planning Mechanisms*

Planning Mechanism	Incorporation of HMAP
Comprehensive Plans	Participating jurisdiction has a Long-Term Comprehensive Development Plan in place. Since comprehensive plans involve developing a unified vision for a community, the mitigation goals of the HMAP 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 will be reviewed, and revised when participating jurisdictions update the management plans or develop new plans.
Grant Applications	The HMAP will be evaluated by participating jurisdictions when grant funding is sought for mitigation projects. If a project is not in the plan update, an amendment may be necessary to include the action in the plan.
Regulatory Plans	Currently, participating jurisdictions have regulatory plans in place, such as Emergency Management Plans, Continuity of Operations Plans, Economic Development Plans, and Evacuation Plans. The HMAP will be consulted when county and city departments review or revise the current regulatory planning mechanisms, or in the development of regulatory plans that are not currently in place.

TIMELINE FOR IMPLEMENTING MITIGATION ACTIONS

The planning teams evaluated and prioritized the most suitable hazard mitigation actions for the community to implement. The timeline for implementation of actions is partially directed by participating jurisdictions' comprehensive planning processes, budgetary constraints, and community needs. Brown County participating jurisdictions are committed to addressing and implementing hazard mitigation actions that are aligned with and integrated into the overall improvement of community resiliency. The planning team agrees that the goals and actions of the HMAP shall be aligned with the timeframe for implementation of hazard mitigation actions with respect to annual review and updates of existing plans and policies. Considerations include start dates, timelines and effects of existing planning mechanisms, and theoretical length of time to complete mitigation actions. Implementation schedules remain generalized but are set with priority based on short-, medium-, and long-term goals of the HMAP hazard mitigation strategy for Brown County (i.e.: 12-24 months versus 24-36 months).

PUBLIC AND STAKEHOLDER INVOLVEMENT

44 CFR REQUIREMENT
Requirement 44 CFR § 201.6(b)(2) The planning process documents the opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development as well as businesses, academia, and other private and non-profit interests to be involved in the planning process. The plan identifies all stakeholders involved or given an opportunity to be involved in the planning process and how each stakeholder was presented with this opportunity.
Requirement 44 CFR § 201.6(b)(1) The planning process documents how the public was involved in the planning process during the drafting stage and prior to plan approval. The plan documents how the public was given the opportunity to be in the planning process and how their feedback was included in the plan.

An important component of hazard mitigation planning is stakeholder involvement and public participation. Input from individual citizens and the community 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-profit organizations, 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 participating jurisdictions ensured increased community outreach to vulnerable populations and considered the additional needs of these communities throughout the planning and public engagement processes.

The public was involved in the development of the HMAP at different stages prior to official plan approval and adoption. Public input was sought using three methods: (1) open public meetings; (2) survey; and (3) public review of planned mitigation actions made available by participating jurisdictions. All three methods presented to the public allowed for opinions and comments. Continued public involvement will occur throughout future evaluation and update processes.

Public Meetings

A public meeting for Brown County was held on August 29th, 2024, at The Brownwood Depot and Cultural Center to collect public and stakeholder input. The public was notified during an open public meeting that the mitigation strategy and action items will be available for further review and comment. No additional feedback was received on following the public meeting. Public input was utilized to assist in identifying hazards that were of most concern to the citizens of Brown County and what actions they felt should be included and prioritized.

The current HMAP was advertised and posted on the WCTCOG and participating jurisdictions' websites, and a copy was maintained at the WCTCOG. Upon FEMA approval and formal adoption, the updated HMAP will be available to the public in redacted form upon request through each participating jurisdiction. An original copy for official use only will be maintained at the WCTCOG.

A public meeting was held in Brown County to collect public and stakeholder input. Topics of discussion included the purpose of hazard mitigation, discussion of the planning process, and types of hazards. Each participating jurisdiction within the county released information regarding the public meeting in their area to increase public participation in the HMAP development process, through posting on websites, social media sources, local media, and/or bulletin boards in public facilities. A sampling of these notices can be found in Appendix B, along with the documentation on the public meetings. Representatives from area neighborhood associations and area residents were invited to participate.

Public Participation Survey

In addition to a public meeting, the hazard mitigation team 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 websites of the WCTCOG and participating jurisdictions. A total of 20 surveys were completed online. The survey results are summarized in Appendix A. Brown County reviewed the input from the surveys and decided which information to incorporate into the HMAP as hazard mitigation actions.

Stakeholders

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, utility providers/distributors, neighboring jurisdictions, schools, hospitals, and organizations that represent, advocate for, and/or interact with underserved and vulnerable communities were invited to participate in development of the HMAP. The stakeholder group included a broad range of representatives from both the public and private sector and served as a key component in WCTCOG's outreach efforts for development of the HMAP.

TABLE 2-6. *Stakeholder Group (2024 planning cycle)*

ORGANIZATION/DEPARTMENT	TITLE	ORGANIZATION/DEPARTMENT	TITLE
Brownwood ISD	Superintendent	Texas Tech University	Program Manager
Bangs ISD	Superintendent	First Baptist Church	Senior Pastor
Blanket ISD	Superintendent	Calvary Baptist Church	Pastor
Early ISD	Superintendent	Midtown Church	Pastor
May ISD	Superintendent	St. John's Church	Priest
Brown County WID	President	High Mesa Cowboy Church	Pastor
Zephyr ISD	Superintendent	Austin Avenue Church of Christ	Minister
Brookesmith VFD	Fire Chief	4th & Stewart Church of Christ	Preacher
Dam VFD	Fire Chief	St. Mary's Catholic Church	Priest
Lake Brownwood VFD	Fire Chief	First Baptist Church	Senior Pastor
May VFD	Fire Chief	Casa in the Heart of Texas	President
North Lake Brownwood VFD	Fire Chief	Aldersgate Enrichment Center	Executive Director
Winchell VFD	Fire Chief	United Way of Brown County	Executive Director
Zephyr VFD	Fire Chief	Good Samaritans Ministries	Executive Director
Early VFD	Fire Chief	Atmos Energy Corporation	Operations Director
Bangs VFD	Fire Chief	TXU Electric	Local Representative
3M	Senior Manufacturing Supervisor	General Power and Light	Manager
Brownwood Country Club	General Manager	Oncor Electric	Representative
Texas State Technical College	Provost	Calvary Church	Pastor
Ranger College	President	Southside Baptist Church	Lead Pastor
Blanket VFD	Fire Chief	Comanche Electric Coop. Assoc. Western Division	Early Representative
Barr	Fabrication	Brookesmith Special Utility District	Manager
Brown County Fairground Assoc	President	Brown County Water Improvement District	General Manager
Howard Payne University	President	Pecan Bayou Soil and Water Conservation District	Field Representative

UPDATES AND ADOPTION

44 CFR REQUIREMENT

Requirement 44 CFR § 201.6(c)(5)) For multijurisdictional plans, the governing body of each jurisdiction officially adopts the plan to be eligible for certain FEMA assistance.

Requirement 44 CFR § 201.6(c)(5)) Each participant adopts the plan and provides documentation of that adoption.

Background information utilized during the planning process included various studies, plans, reports, and technical information from sources such as FEMA, USACE, USFA, NOAA, TWDB, TCEQ, TSDC, TFS, TDEM, and local hazard assessments and plans. Section 4 (Risk and Vulnerability Assessment) and Section 5 (Capability Assessment) summarize relevant background on hazard-specific information obtained from public officials and citizens within Brown County.

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. TSDC documents were used to obtain population projections. The State Demographer webpages were reviewed for population and other projections and are included in Section 3. Information from TFS 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 HMAP development requirements.

Each participating jurisdiction is responsible for obtaining adoption through the applicable governing body to ensure eligibility of certain FEMA assistance programs and will provide documentation of adoption to WCTCOG for insertion in Appendix H.

Planning teams from the participating jurisdictions reviewed existing plans along with building codes to guide development and ensure that hazard mitigation actions are implemented. Each jurisdiction will be responsible for coordinating periodic review of the HMAP with members of the advisory planning team to ensure integration of hazard mitigation strategies into these planning mechanisms, policies, ordinances, and codes.

In accordance with the schedule described in Section 9 for HMAP Maintenance, existing planning mechanisms will be reviewed and analyzed as they pertain to the HMAP to ensure cross-integration of jurisdictional goals. 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 HMAP and contribute to the goals of reducing long-term risk to life and property from moderate and high-risk hazards. In addition, the planning team will also re-evaluate prioritization of the hazard mitigation actions, assess completion rate, and evaluate barriers. The county will notify the WCTCOG hazard mitigation team of any concerns, barriers, requests for funding submitted, or HMAP amendments needed. The WCTCOG plans to seek additional grant funding for hazard mitigation planning prior to the next HMAP update.

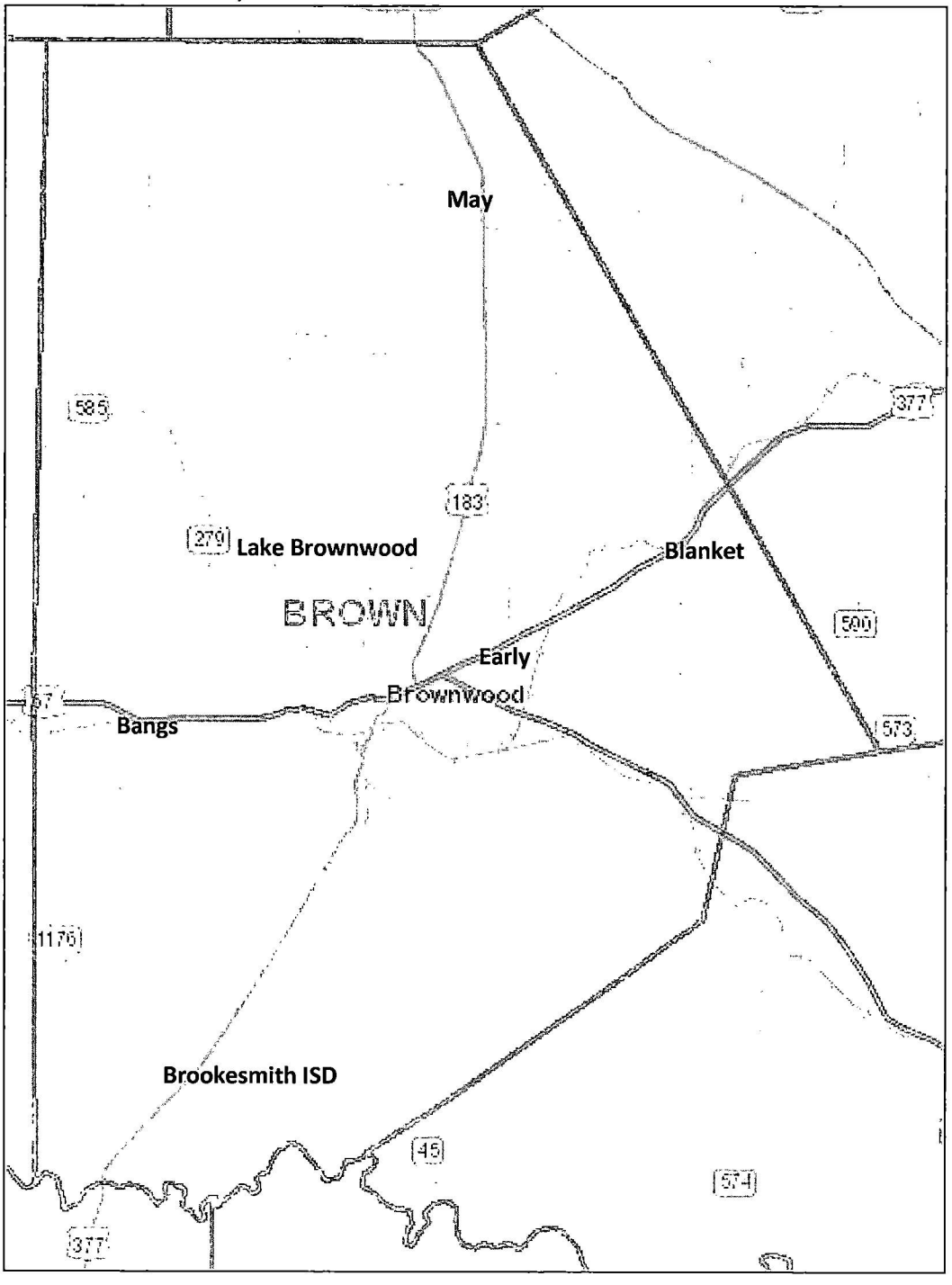
SECTION 3: COUNTY PROFILE

44 CFR REQUIREMENT

Requirement 44 CFR § 201.6(d)(3) The plan describes changes in development that have occurred in hazard-prone areas that have increased or decreased each community's vulnerability since the previous plan was approved.

Brown County is primarily rural and served by an adequate transportation system, including state and county roadways, railways, airport, waterways, and tributaries. Brown County has 957 square miles in total area with 13 square miles covered by water.

FIGURE 3-1. *Brown County*



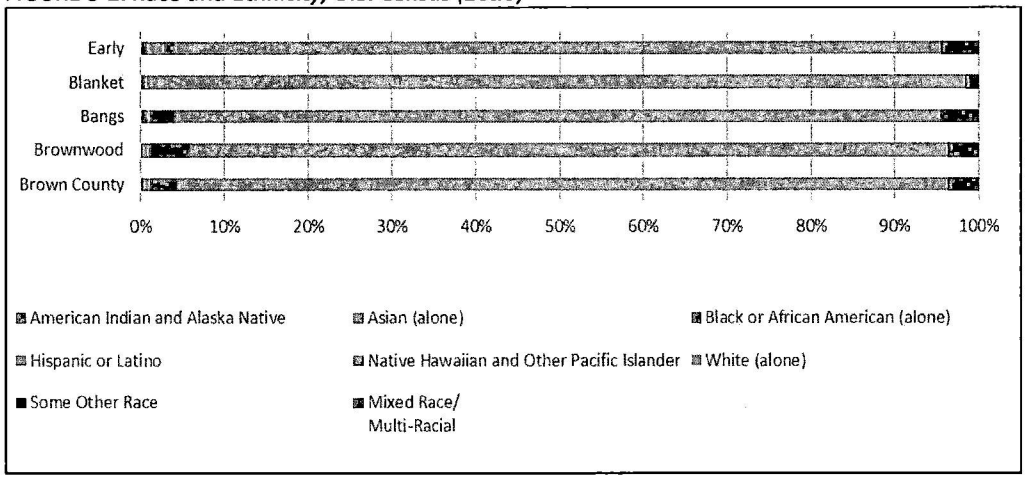
Population and Demographics

According to the 2020 United States Census[13], Brown County had a population of 38,095 residents with an estimated 1.6% population growth by mid-2023[14]. The planning teams considered detailed population and demographic statistics, including vulnerable populations during risk assessments and emergency management planning. Brookesmith ISD is within an unincorporated area of Brown County and therefore the population is addressed within Brown County census information below. However, it is important to note that Brookesmith ISD consists of 6 schools across 1 campus and supports 188 students from pre-kindergarten to 12th grade, with 50% minority enrollment and 32.1% of the students considered economically disadvantaged. See Appendix A for additional U.S. Census population and demographic information.

TABLE 3-1. *Population and Demographics, U.S. Census (2020)*

					Estimated Vulnerable or Sensitive Population			
Jurisdictions	2020 Total Population	Median Household Income ($)	Employment Rate (%)	Total Households	Elderly (over 65) (%)	Below Poverty Level (%)	People with Disabilities (%)	Non-English Speaking at Home (%)
Brown County	38,095	53,792	55.4	14,977	20.1	13.3	21.3	17.0
Brownwood	18,862	45,412	58.9	7,313	15.8	17.6	20.2	22.3
Bangs	1,540	47,490	57.9	625	16.3	12.2	18.7	14.6
Blanket	369	54,583	59.2	141	20.4	10.1	28.6	15.6
Early	9,087	60,313	66.2	1,175	14.4	11.0	16.9	12.6

FIGURE 3-2. *Race and Ethnicity, U.S. Census (2020)*



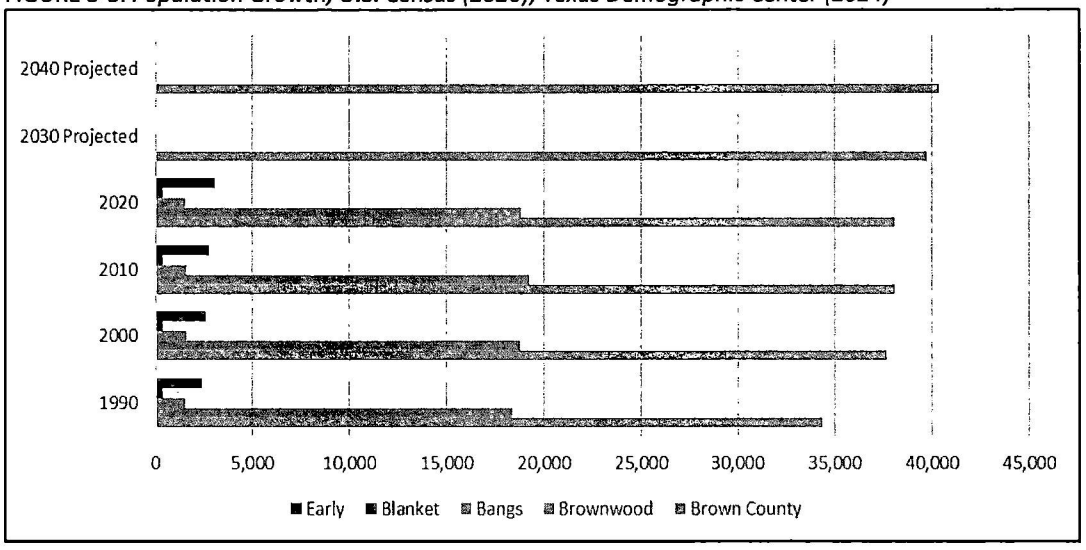
Population Growth and Future Development

Overall, Brown County experienced a 10.83% increase in population between 1990 and 2020, while the cities of Bangs and Blanket experienced population decreases from 2010 to 2020 highlighting population shifts from rural towns to urban areas in recent years, a shift projected to continue across the region. Population projections are only available at the county level[15] and are based on a 0.5 scenario growth rate (50 percent of the population growth rate that occurred during 2010-2020).

Population projections show an increase in population density for Brown County. To better understand how growth and future development in Brown 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.

[13] https://data.census.gov/profile/Brown_Co...?g=050XX00US48049
[14] https://www.census.gov/quickfacts/fact/table/browncountytexas,US/COM100218
[15] U.S. Census Bureau; Texas Demographic Center

FIGURE 3-3. *Population Growth, U.S. Census (2020); Texas Demographic Center (2024)*



ECONOMIC IMPACT

The protection of infrastructure from threats and hazards is important to the participating jurisdictions of Brown County. Critical infrastructure protection consists of mitigation activities that enhance continuity of operations and the ability to continue providing essential utility and emergency response services during an emergency or disaster. Critical infrastructure, such as energy, transportation, and communications, is essential to the region's economy and security. Disruptions to critical infrastructure can have significant economic impacts and consequences, including loss of business, loss of tax revenue, dispersed workforce, health and safety concerns, financial transaction delays, and transportation and supply chain issues.

Major employers in the area are critical to the health of the economy, effective transportation connectivity, and distribution of goods, services, and utilities. Brown County has several large national and international businesses that have created over 3,000 manufacturing jobs (3M, Kohler, Texas Rock Crusher Railway, and Superior Essex).

The City of Brownwood Economic Development created the Brownwood Municipal Development District (BMDD) to promote, assist, stimulate, and enhance economic development in Brownwood. The BMDD may help develop and finance any permissible project that benefits, strengthens, and diversifies the economic base of Brownwood. The City of Bangs Economic Development promotes economic growth through new businesses and affordable housing incentive programs. The Early Municipal Development District celebrates and encourages small business support. Small businesses are the heartbeat of these communities.

EXISTING AND FUTURE LAND USE AND DEVELOPMENT TRENDS

Several participating jurisdictions have comprehensive master plans in place, a structured planning process for the development of community visions for conservation, preservation, land use, and development with long-term goals and objectives. For example, the City of Brownwood 2010 Comprehensive Plan ensures that new development and redevelopment of land, roads, parks, and public facilities is well-planned and occurs in a manner that achieves the desired vision of the community. Planning and development issues, zoning measures, building codes, landscaping codes, and other land use concerns are frequently discussed within each jurisdiction internally and publicly to ensure the most effective measures are implemented according to the desired resident outcomes. Often, public discussion and debates have been warranted related to the adoption or enforcement of more stringent building codes that may offer increased mitigation, especially in urbanized settings and as the Wildland Urban Interface (WUI) continues to increase.

SECTION 4: RISK AND VULNERABILITY ASSESSMENT

Risk Analysis and Assessment Matrix

A risk assessment is a critical component of a hazard mitigation plan that helps determine the potential impacts of hazards on a community, including people, the economy, and the built and natural environments. It provides a factual basis for the activities proposed in the mitigation strategy and helps inform priorities, develop/compare courses of action, and inform decision making.

METHODOLOGY

According to FEMA, risk is a function of the nature and magnitude of a threat, the vulnerabilities to that threat, and the consequences that could result. A widely used approach is to define the risk function as the product of the three fundamental variables: Risk = Threat x Vulnerability x Consequence.

Risk is the likelihood of a hazard event causing an adverse condition that results in damage or injury. It is also defined as the probability or threat of loss, liability, injury, damage, or any other negative occurrence. Risk is a function of hazard occurrence and projected losses, and depends on three factors: hazard, vulnerability, and exposure:

- ✓ Hazard: something that is potentially harmful or dangerous
- ✓ Vulnerability: how exposed or susceptible an asset is to damage
- ✓ Exposure: what lies in the area the hazard could affect

This risk equation was utilized to assess risk for the county and each participating jurisdiction (see Risk Summary, Section 4). FEMA has several methodologies for assessing risk, including: standardized risk assessments that measure potential loss of life, personal injury, economic loss, and property damages from hazards; the National Risk Index that assess expected annual losses, social vulnerability, and community resilience; the Resilience Analysis and Planning Tool (RAPT) that analyzes and maps relationships between census data, infrastructure locations, and hazards; and the Threat and Hazard Identification and Risk Assessment (THIRA) that aids communities in understanding their risks and the associated impact of those risks. The methodologies utilized to develop the Risk Analysis include a historical analysis and a statistical approach. Both methodologies provided an estimate of potential impact by using a common, systematic framework for evaluation. Records retrieved from NCEI and NOAA were reported for the participating jurisdictions. Remaining records identifying the occurrence of hazard events in the planning area and the maximum recorded magnitude of each event were also evaluated. Geographic Information System (GIS) technology was utilized to identify and assess risks and evaluate community assets and their vulnerability to the hazards.

Exposure Analysis

Brown County and the participating jurisdictions evaluated the potential exposure of people, property, systems, and functions that could be lost to a hazard through the risk, vulnerability, and capability assessments within the hazard mitigation planning process. This included identifying hazards, evaluating risks, profiling hazards and consequences, and determining vulnerabilities.

Historical Analysis

Background research of Brown County and participating jurisdictions for the hazard identification process included record retrieval from the U.S. Department of Homeland Security (DHS), Electric Reliability Council of Texas (ERCOT), FBI, FEMA, NCEI, NOAA, TCEQ, TDEM, Texas Department of Public Safety (DPS), TFS, U.S. Department of Agriculture (USDA), U.S. Geological Survey (USGS), and local agencies, officials, and stakeholders. The methodologies utilized to develop the risk assessment included historical analysis and statistical approaches to estimate the potential impact through a common, systemic framework for evaluation. Records of past hazard events were evaluated for magnitude and scope.

Scenario Analysis

The WCTCOG Threat and Hazard Identification and Risk Assessment (THIRA) conducted in 2023 comprehensively covered 32 capability targets across the 19-county region; however, the scenarios discussed did not specifically involve any participating jurisdictions within this HMAP. The HMAP planning teams discussed scenarios during the risk identification and assessment processes to evaluate applicable vulnerabilities and capabilities pertinent to the development of a hazard mitigation strategy.

Changes in Development Analysis

44 CFR REQUIREMENT

Requirement 44 CFR § 201.6(d)(3) The plan describes changes in development that have occurred in hazard-prone areas that have increased or decreased each community's vulnerability since the previous plan was approved.

Development changes, both structural and non-structural, were assessed across each participating jurisdiction, especially within hazard-prone areas, and incorporated into the risk assessment, vulnerability assessment, and capability assessment. The results of these assessments guided decisions on mitigation strategies and actions.

HAZARD IDENTIFICATION

44 CFR REQUIREMENT

Requirement 44 CFR § 201.6(c)(2)(i) The plan describes all natural hazards that can affect the jurisdiction(s) in the planning area.

Requirement HHPD The plan addresses HHPDs in the risk assessment. The plan describes the risks and vulnerabilities to and from HHPDs.

Upon review of the natural hazards suggested under FEMA hazard mitigation planning guidance and hazards identified within the 2023 Texas Hazard Mitigation Plan, Brown County identified twelve (12) natural hazards as significant. Beyond the state and federal requirements of hazard mitigation planning, Brown County also identified twelve (12) technological and seven (7) human-caused hazards that are addressed in the HMAP due to the increased concerns regarding occurrence, scope, and magnitude of these hazards nationally. Note: Atmospheric natural hazards are events or incidents associated with weather generated phenomenon. Hydrologic natural hazards are events or incidents associated with water related damage and account for over 75% of federal disaster declarations in the United States. Technological hazards refer to incidents that arise from human activities but are not inherently human induced (i.e.: disaster may be caused by human error but does not involve intent to harm). Human-caused hazards refer to incidents that arise from deliberate or intentional human actions to threaten or harm the well-being of people or property.

TABLE 4-1. *Natural Hazards*

HAZARD	DESCRIPTIONS
	ATMOSPHERIC
EXTREME HEAT	Temperatures hover ten degrees or more above the average high temperature in a region for an extended period.
HAILSTORM	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 releasing hail ranging in size.
SEVERE WIND	3 significant types: straight-line (thunderstorm winds not associated with rotation), derecho (widespread, long-lived windstorm with band of rapidly moving storm), and gust front (leading edge or rain-cooled air that clashes with warmer thunderstorm inflow).
TORNADO	Violently rotating column of air that has contact with the ground; often visible as a funnel cloud; vortex rotates cyclonically with wind speeds ranging from 40 mph to 300 mph; destruction ranges from light to catastrophic depending on location, intensity, size, and duration of the storm.
LIGHTNING	Visible electrical discharge or spark of electricity in the atmosphere between clouds, the air and/or the ground often produced by a thunderstorm.
SEVERE WINTER STORM	Snow, sleet, freezing rain, and/or mixture of these forms of precipitation; blizzards combine low temperatures, heavy snowfall, and winds of at least 35 mph reducing visibility; ice storms occur when moisture falls and freezes immediately upon impact with trees, power lines, communication towers, structures, roads, and other surfaces; winter storms and ice storms may down trees, cause widespread power outages, damage property, and cause fatalities and injuries.
	HYDROLOGIC
DROUGHT	Prolonged period of less than normal precipitation such that the lack of water causes a serious hydrologic imbalance; common effects of drought include increased wildfire risk, crop failure, water supply shortages, and fish and wildlife mortality.
FLOOD / STORMWATER RUNOFF	Flooding is an accumulation of water within a body of water resulting in the overflow of excess water onto adjacent lands, usually floodplains (land adjoining the channel of a river, stream, ocean, lake, or other watercourse or water body susceptible to flooding); 3 categories: riverine flooding, coastal flooding, shallow flooding. Stormwater runoff is generated from rain and snowmelt that flows over land or impervious surfaces, such as paved streets, parking lots, and building rooftops, and does not soak into the ground; runoff can pick up and deposit harmful pollutants into waterways.

TABLE 4-1, CONTINUED. *Natural Hazards*

HAZARD	DESCRIPTIONS
	OTHER
EARTHQUAKE	Sudden, rapid, shaking of the earth caused by the breaking and shifting of the subterranean rock as it releases strain that has accumulated over time; initial mild shaking may strengthen and become extremely violent within seconds.
EXPANSIVE SOIL	Soft rock that tends to swell or shrink due to changes in moisture content; changes in volume present a hazard to structures.
WILDFIRE	Uncontrolled fire burning in areas 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 increase the risk to people and property within the hazard area or along the urban wildland interface; part of natural management of forest ecosystems, but most are caused by human factors.
INFECTIOUS DISEASE	Illness caused by harmful, microscopic organisms/pathogens (viruses, bacteria, fungi, or parasites) that enter the body; passed directly or indirectly from one person to another.

TABLE 4-2. *Technological Hazards*

HAZARD	DESCRIPTIONS
TRANSPORTATION INCIDENT (ROADWAYS)	Incident involving at least one moving road vehicle on a public or private road that results in at least one person being injured or killed; exceeds typical roadway incidents for jurisdiction and overwhelms local resources.
AIRCRAFT INCIDENT	Accident in which aircraft hits land or water; causes damages and/or casualties.
TRAIN DERAILMENT	Classification of train incident that occurs when any portion of the train comes off rails.
COMMUNICATION and/or COMPUTER DATABASE FAILURE	Unintentional disruption of communication abilities and/or ability to access the information in the jurisdiction's database leading to internal communication failures for first responders, departmental workflow disruptions, and external issues that affect stakeholders.
DAM FAILURE	Uncontrolled release of water or waste due to the catastrophic collapse, breach, or overtopping of a dam leading to significant downstream flooding, casualties, property damage, and economic losses.
POWER FAILURE	Disruption of electrical supply to a particular building, community, or region.
HAZARDOUS MATERIALS RELEASE (HAZMAT)	(Chemical, Biological, Radiological, Nuclear, Explosive) Unintentional release of HAZMAT not due to natural or human caused hazards; any situation that poses a potential threat to human health and safety or the environment; may occur accidentally during production, storage, transportation, use, or disposal.
FACTORY EXPLOSION	Rapid increase in volume and energy release caused by various factors including heat, chemical reactions, electrical arcs, or mechanical failure.
STRUCTURE COLLAPSE	Building collapses into itself and pulls the exterior walls into the falling structure when the internal load bearing structural elements fail.
URBAN FIRE (UNINTENTIONAL)	Fire primarily occurring in cities or towns with the potential to rapidly spread to adjoining structures.
PIPELINE SPILL / RELEASE	Discharge of materials in a pipeline caused by any leak, break, fire, explosion, or malfunction.
WATER MAIN BREAK	Damage to the point of failure to the water main results in water runoff and disruption of service.

TABLE 4-3. *Human Caused Hazards*

HAZARD	DESCRIPTIONS
ACTIVE SHOOTER / ACTIVE ATTACK	Individual engaged in attempting to harm or kill people in a confined space or populated area; typically using firearms; no pattern to victim selection.
CYBERATTACK	Malicious attempt to access or damage a computer network system; disrupt, disable, destroy, or maliciously control a computing environment or infrastructure; destroy the integrity of the data; steal controlled information.
POWER GRID ATTACK	Attempt to exploit vulnerabilities in the power grid; cause power outages, damage infrastructure, result in loss of life; cyber or physical attacks; target protection systems in digital substations leading to disconnections in generation and lines; intrusions into control houses to damage or destroy assets, set fires, tamper with switches; attack outside perimeter of electrical infrastructure; ballistic attacks on substations.
WATER SUPPLY CONTAMINATION (INTENTIONAL)	Intentional contamination of water supply with harmful substances making it unsafe for drinking, cooking, and other uses; substances may be physical, chemical, biological, or radiological, and include germs, bacteria, viruses, and chemicals; may occur at the water's source or in the distribution system after the water has been treated.
HAZMAT ATTACK	Intentional release of a HAZMAT to cause harm, such as in a terrorist attack. HAZMATs include chemicals, radioactive materials, biological materials, explosives, flammable substances, poisons, and more; exposure to these substances can cause serious medical complications for victims and responders.

TABLE 4-3, CONTINUED. *Human Caused Hazards*

HAZARD	DESCRIPTIONS
WILDFIRE/URBAN FIRE (MALICIOUS)	Willful or malicious burning of property, especially with criminal or fraudulent intent.
CIVIL UNREST	Range of group actions that can be violent or nonviolent, and are often a response to political, economic, or social issues; may include: riots, protests, demonstrations, threatening individuals or assemblies, limited political violence, sporadic violent collective action, nonviolent and mildly violent collective action; may be a slow build of discontent within a group of people or an immediate response to a major political issue or legislation; also known as civil disorder, civil strife, or turmoil.

Hazards Excluded from Risk Assessment

44 CFR REQUIREMENT

Requirement 44 CFR § 201.6(c)(2)(i) The plan provides rationale if omitting any natural hazards that are commonly recognized to affect the jurisdiction(s) in the planning area.

Coastal erosion, hurricanes, and land subsidence were hazards listed by FEMA and TDEM not considered significant to Brown County and were not included in the HMAP but may be assessed during future updates.

TABLE 4-4. *Hazards Excluded from HMAP*

HAZARD CONSIDERED	REASON FOR DETERMINATION
COASTAL EROSION	The county is not located on the coast; therefore, coastal erosion does not pose a risk.
HURRICANE	The county is not located within 200 miles of the coast; therefore, hurricanes do not pose a risk. Any remnants of a hurricane or tropical storm system would be covered through severe weather assessment and mitigation.
LAND SUBSIDENCE	There are no historical occurrences of land subsidence for the county. The county is 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, and is not expected in the future.

Significant Events Since the Last HMAP

Over the past 25 years, 22 disasters have been declared by Brown County, most of which related to fire incidents. Two disaster declarations have been declared since the last HMAP; however, these declarations were for the same severe winter storm incident. Although flooding has been identified by the planning team as a high priority hazard, there has been no significant incidents since 2018 with no reported property or agricultural losses due to flooding.

TABLE 4-5. *History of Disaster Declarations in Brown County*

DATE	DESCRIPTION	DATE	DESCRIPTION
2021-02-10	Severe Winter Storm (county-wide)	2005-11-26	Wildfire (Extreme Wildfire Threat)
2021-02-10	Severe Winter Storm (county-wide)	2002-09-22	Hurricane (Hurricane Rita)
2020-01-19	Infectious Disease (COVID-19)	2005-09-19	Hurricane (Hurricane Rita)
2018-09-09	Flood	2002-06-28	Flood; Severe Weather
2018-07-22	Wildfire (259 Fire)	1999-07-31	Wildfire (Extreme Fire Hazards)
2016-05-21	Flood	1998-08-21	Severe Weather (Tropical Storm Charlie)
2015-05-03	Severe Weather; Tornadoes; Severe Wind; Flood	1996-02-22	Wildfire (Extreme Fire Hazards)
2011-04-05	Wildfire	1993-08-29	Wildfire (Extreme Fire Hazards)
2008-06-15	Wildfire (Camp Bowie Fire)	1991-12-19	Flood; Severe Weather
2008-03-13	Wildfire	1990-04-14	Severe Weather; Tornadoes; Flood
2007-06-15	Severe Weather; Tornadoes; Flood	1989-05-03	Severe Weather; Tornadoes; Flood

Hazard Prioritization

44 CFR REQUIREMENT

Requirement 44 CFR § 201.6(d)(3) The plan was revised to reflect changes in priorities and progress in local mitigation efforts.

Requirement 44 CFR § 201.6(d)(3) The plan describes how it was revised due to changes in community priorities.

To better understand how future growth and development in Brown 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. Hazard vulnerability for all participating jurisdictions in Brown County was reviewed based on recent development changes that occurred throughout the planning area. Brown County has grown minimally between 2010 and 2024, and therefore there has been no significant factors or development trends with a consequential effect or increase in vulnerability to the population, infrastructure, and buildings for hazards. This HMAP has undergone a complete overhaul of previous hazard priorities and mitigation action items to best reflect the current needs of the participating jurisdictions. All assessments, evaluations, and prioritizations have been completed from start to finish during this planning cycle and the strategies and actions reflect these changes.

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. The use of geographic information system (GIS) technology to identify and assess risks for Brown 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.

NOTES: The planning team discussed and agreed flooding/stormwater runoff was a higher concern than the risk assessment reflected for the City of Brownwood. Brookesmith ISD conducted a risk assessment utilizing hazards identified by the Texas School Safety Center (TxSSC) Hazard Analysis Tool Scoring Guide.

TABLE 4-6. *Priority Level of Natural Hazards from Risk Analysis, Natural Hazards, 2024*

Rank	Brown County	Bangs	Blanket	Brownwood	Early	Brookesmith ISD
1	Wildfire	Drought	Flood/ Stormwater Runoff	Severe Winter Storm	Extreme Heat	Tornado
2	Extreme Heat	Extreme Heat	Extreme Heat	Infectious Disease	Drought	Severe Thunderstorm
3	Infectious Disease	Flood/ Stormwater Runoff	Drought	Drought	Wildfire	Wildfire
4	Hailstorm	Wildfire	Wildfire	Extreme Heat	Severe Winter Storm	Winter Storm
5	Drought	Tornado	Hailstorm	Severe Wind	Tornado	Communicable Disease
6	Severe Winter Storm	Severe Winter Storm	Tornado	Wildfire	Hailstorm	Flooding
7	Severe Wind	Hailstorm	Severe Winter Storm	Tornado	Infectious Disease	Earthquake
8	Tornado	Severe Wind	Severe Wind	Flood/ Stormwater Runoff	Flood/ Stormwater Runoff	Hurricane/ Tropical Storm
9	Flood/ Stormwater Runoff	Lightning	Lightning	Lightning	Severe Wind	NA
10	Lightning	Infectious Disease	Earthquake	Expansive Soil	Lightning	NA
11	Expansive Soil	Earthquake	Infectious Disease	Earthquake	Earthquake	NA
12	Earthquake	Expansive Soil	Expansive Soil	Hailstorm	Expansive Soil	NA

TABLE 4-7. *Priority Level of Technological Hazards from Risk Analysis, Natural Hazards, 2024*

Rank	Brown County	Bangs	Blanket	Brownwood	Early	Brookesmith ISD
1	Power Failure	Power Failure	Water Main Break	Power Failure	Water Main Break	Major Utility Loss
2	Water Main Break	Water Main Break	Power Failure	Communication Failure / Database Failure	Power Failure	Highway Accident/ HAZMAT
3	Communication Failure / Database Failure	Communication Failure / Database Failure	Communication Failure / Database Failure	Transportation Incident	Transportation Incident	Chemical Plant Release
4	Transportation Incident	Urban Fire	Train Derailment	Water Main Break	Pipeline Incident	Train Derailment
5	Urban Fire	Train Derailment	Structure Collapse	HAZMAT Release	Structure Collapse	Pipeline Release
6	HAZMAT Release	Airplane Crash	Airplane Crash	Train Derailment	HAZMAT Release	NA
7	Train Derailment	HAZMAT Release	Dam Failure	Dam Failure	Urban Fire	NA
8	Dam Failure	Transportation Incident	HAZMAT Release	Urban Fire	Factory Explosion	NA
9	Factory Explosion	Structure Collapse	Factory Explosion	Pipeline Spill	Dam Failure	NA
10	Pipeline Spill	Pipeline Spill	Pipeline Spill	Factory Explosion	Airplane Crash	NA
11	Airplane Crash	Dam Failure	Urban Fire	Structure Collapse	Communication Failure / Database Failure	NA
12	Structure Collapse	Factory Explosion	Transportation Incident	Airplane Crash	Train Derailment	NA

TABLE 4-8. *Priority Level of Human Caused Hazards from Risk Analysis, Natural Hazards, 2024*

Rank	Brown County	Bangs	Blanket	Brownwood	Early	Brookesmith ISD
1	Power Grid Attack	Water Supply Contamination	Power Grid Attack	Cyberattack	Water Supply Contamination	Active Shooter (Attacker)
2	Cyberattack	Power Grid Attack	Water Supply Contamination	Power Grid Attack	Active Shooter/ Attack	Cyberattack/ Ransomware
3	Wildfire/Urban Fire	Wildfire/Urban Fire	Active Shooter/ Attack	Water Supply Contamination	Wildfire/Urban Fire	NA
4	HAZMAT Attack	Cyberattack	Wildfire/Urban Fire	HAZMAT Attack	Cyberattack	NA
5	Water Supply Contamination	HAZMAT Attack	Cyberattack	Wildfire/Urban Fire	Power Grid Attack	NA
6	Active Shooter/ Attack	Active Shooter/ Attack	HAZMAT Attack	Active Shooter/ Attack	HAZMAT Attack	NA
7	Civil Unrest	Civil Unrest	Civil Unrest	Civil Unrest	Civil Unrest	NA

Community Assets

Building Resilient Infrastructure and Communities (BRIC) previously supported local governments as they work to reduce hazard risks, but is no longer an active program through FEMA[16]. The program aimed to support communities to build capability and capacity while encouraging innovation through partnerships and infrastructure projects. Community assets that aid in the capabilities and capacities of local governments and communities to improve resiliency and reduce risk include the people, the economy, the built environment, and the natural environment.

[16] https://www.fema.gov/grants/mitigation/learn/building-resilient-infrastructure-communities

PEOPLE

In 2022, Brown County had a population[17] of 38.2k people with a median age of 41.2 and a median household income of $53,792. Between 2021 and 2022 the population of Brown County, TX grew from 38,085 to 38,159, a 0.194% increase and its median household income grew from $49,232 to $53,792, a 9.26% increase. The 5 largest ethnic groups in Brown County, TX are White (Non-Hispanic) (69.7%), White (Hispanic) (11.6%), Two+ (Hispanic) (9.68%), Black or African American (Non-Hispanic) (3.32%), and two or more (non-Hispanic) (2.59%). None of the households in Brown County, TX reported speaking a non-English language at home as their primary shared language. This does not consider the potential multi-lingual nature of households, but only the primary self-reported language spoken by all members of the household. 97.8% of the residents in Brown County are U.S. citizens. The largest universities in Brown County are Howard Payne University (156 degrees awarded in 2022). In 2022, the median property value in Brown County was $137,900, and the homeownership rate was 68.3%. Most people in Brown County drove alone to work, and the average commute time was 18.1 minutes. The average car ownership in Brown County was 2 cars per household. Brown County borders Callahan County, Coleman County, Comanche County, Eastland County, McCulloch County, Mills County, and San Saba County.

ECONOMY

The economy[18] of Brown County employed 17,300 people as of 2022, a 3% growth from 2021. The largest industries in Brown County are health care and social assistance (2,414 people), manufacturing (2,395 people), and retail trade (2,192 people), and the highest paying industries are mining, quarrying, and oil and gas extraction ($100,757), information ($85,500), and utilities ($75,192).

NATURAL ENVIRONMENT

FEMA has incentivized the protection and use of the natural environment through HMGP and BRIC grant funding in hazard mitigation projects that reduce potential harm to people or property.

Protected Natural Areas

Less than 500 acres across Brown County are considered conserved lands by the Texas Land Trust Council. Brown County has one state park. The Civilian Conservation Corps built Lake Brownwood State Park, now maintained by the Texas Parks and Wildlife Department. Located on the shore of Lake Brownwood, a 7,300 surface-acre lake, it includes nine miles of hiking and biking trails, fishing, wildlife, and plant life.

Watershed and Water Resources

Pecan Bayou Basin:

The Central Oklahoma-Texas Plains region is a transition area between the former prairie, now winter wheat-growing regions to the west and the forested low mountains of eastern Oklahoma. The region does not possess the arability and suitability for crops such as corn and soybeans that are common in the Central Great Plains to the northeast. Transitional "cross-timbers" are the native vegetation, and presently rangeland and pastureland comprise the predominant land cover. Oil production has been a major activity in this region for a century.

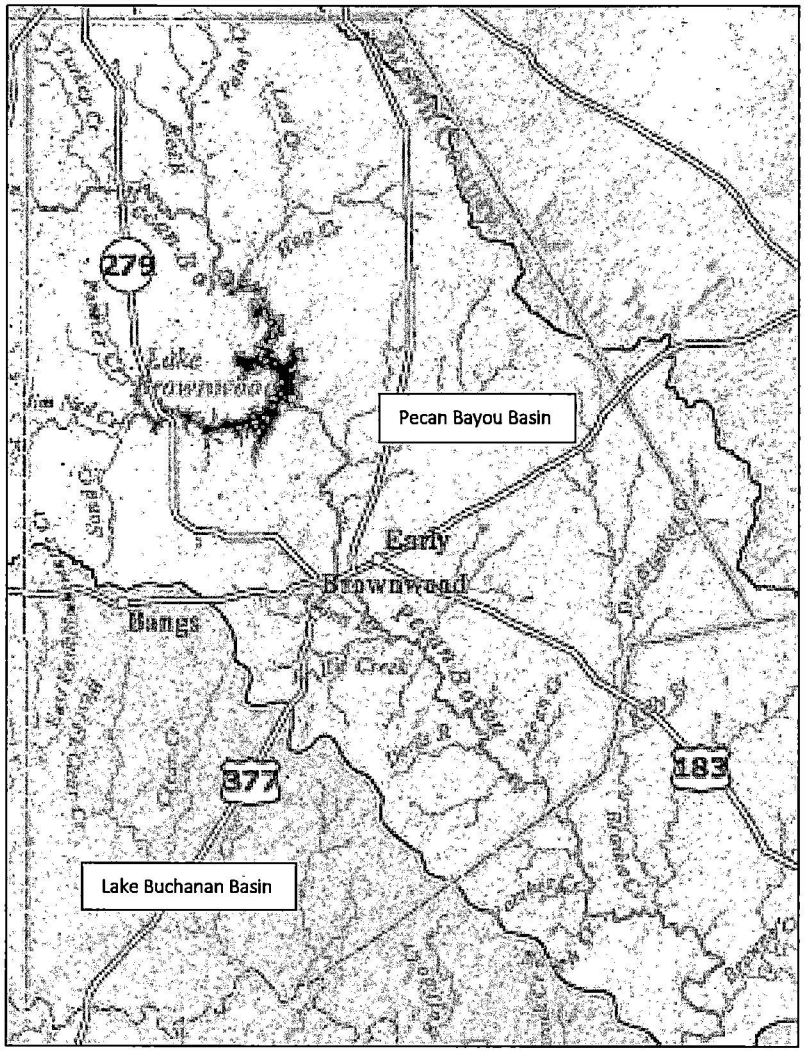
Lake Buchanan Basin:

Three ecoregions cover this area. The Central Great Plains region is slightly lower, receives more precipitation, and is somewhat more irregular than the Western High Plains to the west. The Central Texas Plateau (Edwards Plateau) is a largely dissected plateau that is hillier in the south and east where it is easily distinguished from bordering ecological regions by a sharp fault line. The climate in the Central Great Plains is arid with wide ranges in temperature and precipitation and frequent windstorms. Annual average precipitation is about 20 inches (highest levels typically in May).

[17] https://datausa.io/profile/geo/brown-county-tx

[18] https://datausa.io/profile/geo/brown-county-tx#economy

FIGURE 4-1 *River Basin Watershed*[19]



BUILT ENVIRONMENT

Hazard mitigation is a sustained process that aims to reduce or eliminate the long-term risk to life and property from disasters through hazard mitigation planning, mitigation reconstruction, and hazard mitigation assistance. Nature-based solutions involve engineering planning and practices that incorporate natural features into the built environment to increase resilience and adaptation to support several issues including flood risk reduction and water quality improvements.

Existing Structures

FEMA Hazard Mitigation Assistance (HMA) programs can fund actions to modify existing structures to protect them from hazards, including: retrofits (structural or non-structural modifications to reduce the risk of future damage); mitigation reconstruction (construction of an improved, elevated building on the same site as a partially or completely demolished building); removing structures from hazard areas (removing existing structures from areas at risk of subsidence); and constructing safe rooms (building safe rooms to protect people).

Historic and Cultural Resources

Brown County has 7 places on the National Register of Historic Places[20]. Brown County Jail, Greenleaf Fisk House, R.F. Hardin High School, Santa Fe Railroad Station, St. John's Episcopal Church, J.A. Walker House, and R.B. Rogers House.

[19] https://maps.lcra.org/default.aspx?MapType=Watershed%20Maps

[20] https://www.nationalregisterofhistoricplaces.com/TX/Brown/state.html

Future Development

Future development within Brown County and the participating jurisdictions will be conducted with hazard mitigation planning in mind to help reduce the impact of disasters. For example, the following areas should be evaluated within planning mechanisms: preserving natural areas (policies that protect floodplains or riparian corridors can help avoid or minimize development in hazardous areas); reducing damage to existing and future development; strengthening community resilience (prioritizing hazard mitigation planning to protect lives and property from hazards); and aligning plans (aligning hazard mitigation plans and other community plans with economic development strategies to improve resiliency).

Th WCTCOG is actively working on community and economic development initiatives, including grant programs for infrastructure and business expansion. The Brownwood Municipal Development District is involved in downtown revitalization and expansion of retail opportunities. The Early Economic Development Corporation facilitates business incentives and infrastructure improvements to boost the local economy.

Brown County does not regulate land use for residential, commercial, or industrial purposes. The land use authority for Brookesmith ISD primarily falls under the jurisdiction of the county government. The Brown County Commissioners Court oversees land use regulations in unincorporated areas, including those affecting school districts. Brookesmith ISD has some autonomy in managing facilities and land use within the framework of local and state regulations. Bangs, Blanket, Brownwood, and Early have zoning authority and regulate land use within city limits.

Infrastructure

Brown County and its cities (Bangs, Blanket, Brownwood, and Early) have a broad mix of essential infrastructure supporting residents and businesses. The region benefits from a structured water supply system, transportation infrastructure that facilitates connectivity and commerce, healthcare facilities, educational institutions, and commercial centers. The area also has historical significance with infrastructure evolving alongside development. Traditional and renewable energy infrastructure includes natural gas pipelines, potential solar energy, and existing wind energy. Blanket benefits from wind energy revenues in neighboring Comanche County.

ERCOT oversees the state's power grid and power distribution system reliability. Reforms were implemented following severe winter weather in 2021 that resulted in widespread power outages that included improved communication between natural gas suppliers and electric providers.

TxDOT, Brownwood District[21], spends approximately $10 million on sealcoating projects and several million dollars rehabilitating I-20 north of Brown County and other major corridors. The Brownwood District's priority corridor efforts focus on I-20, US 183, US 84, US 377, US 67, and US 190, to include nearly 300 bridges.

Brownwood and Brown County are upgrading their emergency radio systems to improve communication among public safety agencies. The project includes replacing outdated equipment, expanding radio tower sites, and ensuring interoperability for emergency response.

Current infrastructure development projects include:

- ✓ Highway 377 improvements: Brown County has joined TEX-21, an organization advocating for transportation infrastructure improvements. Highway 377 is heavily traveled and has a crash rate 55% higher than the state average.
- ✓ Natural Gas Pipeline: The DeLa Express Project is a proposed 690-mile pipeline transporting natural gas from West Texas to Louisiana. The pipeline will run through Brown County, with a compressor station planned in the area. The project is expected to create temporary jobs during construction and full-time positions once operational.
- ✓ Water Supply Planning: Brown County is part of the Region F Regional Water Planning Area. The Texas Water Development Board provides resources for drought resilience and future supply needs, specifically improvements to water treatment facilities and wastewater management systems.

[21] https://www.txdot.gov/about/districts/brownwood-district.html

CRITICAL INFRASTRUCTURE / COMMUNITY LIFELINES

Brown County

FIGURE 4-2. *Brown County Critical Infrastructure*

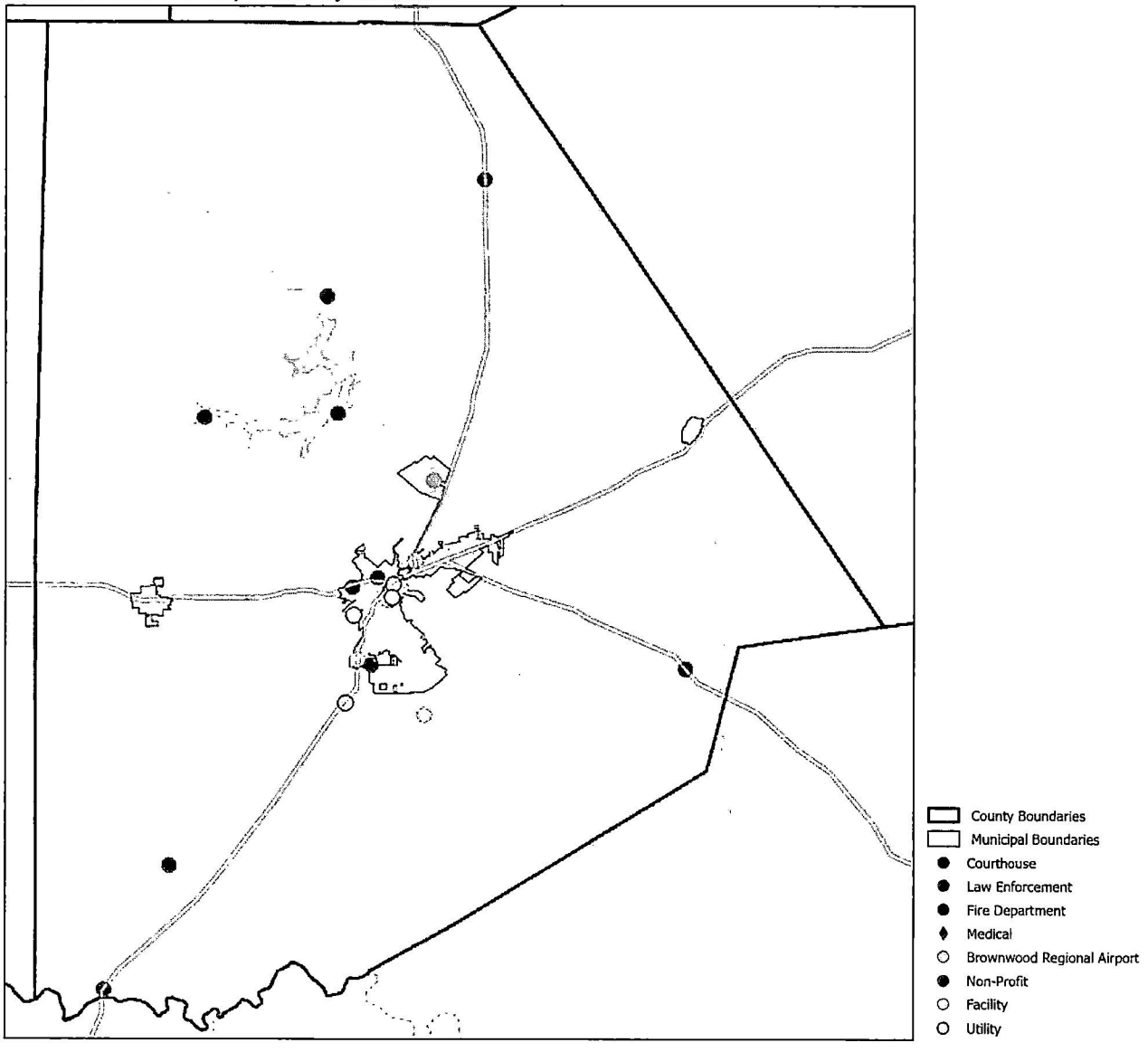


TABLE 4-9. *Brown County Critical Infrastructure*

FACILITY	LATITUDE	LONGITUDE	FACILITY	LATITUDE	LONGITUDE
Brown County Courthouse	31°43'22"N	98°58'49"W	*May Independent School District	31°58'44"N	98°55'21"W
Brown County Sheriff's Office/ Jail	31°43'32"N	99°00'14"W	*May High School	31°58'47"N	98°55'25"W
Brown County/ Brownwood EOC	31°43'01"N	98°58'47"W	May Volunteer Fire Department	31°58'52"N	98°55'12"W
Brown County Veteran Services	31°40'36"N	98°59'31"W	*Zephyr Independent School District	31°40'26"N	98°47'37"W
Brown County Appraisal District	31°43'09"N	98°58'53"W	*Zephyr Elementary / High School	31°40'35"N	98°47'38"W
Brownwood-Brown County Health Department	31°43'07"N	98°58'43"W	*Zephyr Volunteer Fire Department	31°40'26"N	98°47'37"W
Brown County AgriLife Extension	31°43'05"N	98°58'58"W	Winchell Volunteer Fire Department	31°28'25"N	99°09'36"W
Brown County Water Improvement District	31°43'38"N	98°58'40"W	Dam Volunteer Fire Department	31°50'05"N	99°00'46"W
Brown County Water Improvement District No. 1	31°43'09"N	98°58'43"W	Lake Brownwood VFD	31°49'56"N	99°05'47"W
Brown County Water Treatment District No. 1	31°42'27"N	99°00'10"W	North Lake Brownwood VFD	31°54'28"N	99°01'09"W
Brown County Fair Grounds	31°40'49"N	99°00'00"W	Texas Department of Public Safety	31°43'54"N	98°59'16"W
*Brookesmith Independent School District	31°32'50"N	99°07'11"W	TxDOT, Brownwood District HQ	31°44'31"N	98°57'50"W
Brookesmith Volunteer Fire Department	31°33'06"N	99°07'07"W	Texas A&M Forest Service	31°38'43"N	98°57'29"W
Brookesmith Water Supply Corporation	31°39'11"N	99°00'29"W	US Department of Agriculture	31°43'33"N	98°58'23"W

* Schools and school facilities listed here are mapped on page 36, Independent School District Boundary Lines.
† Communication towers are identified on page 86, Communication and/or Database Failure Hazard Profile.

Bangs

FIGURE 4-3. *Bangs Critical Infrastructure*

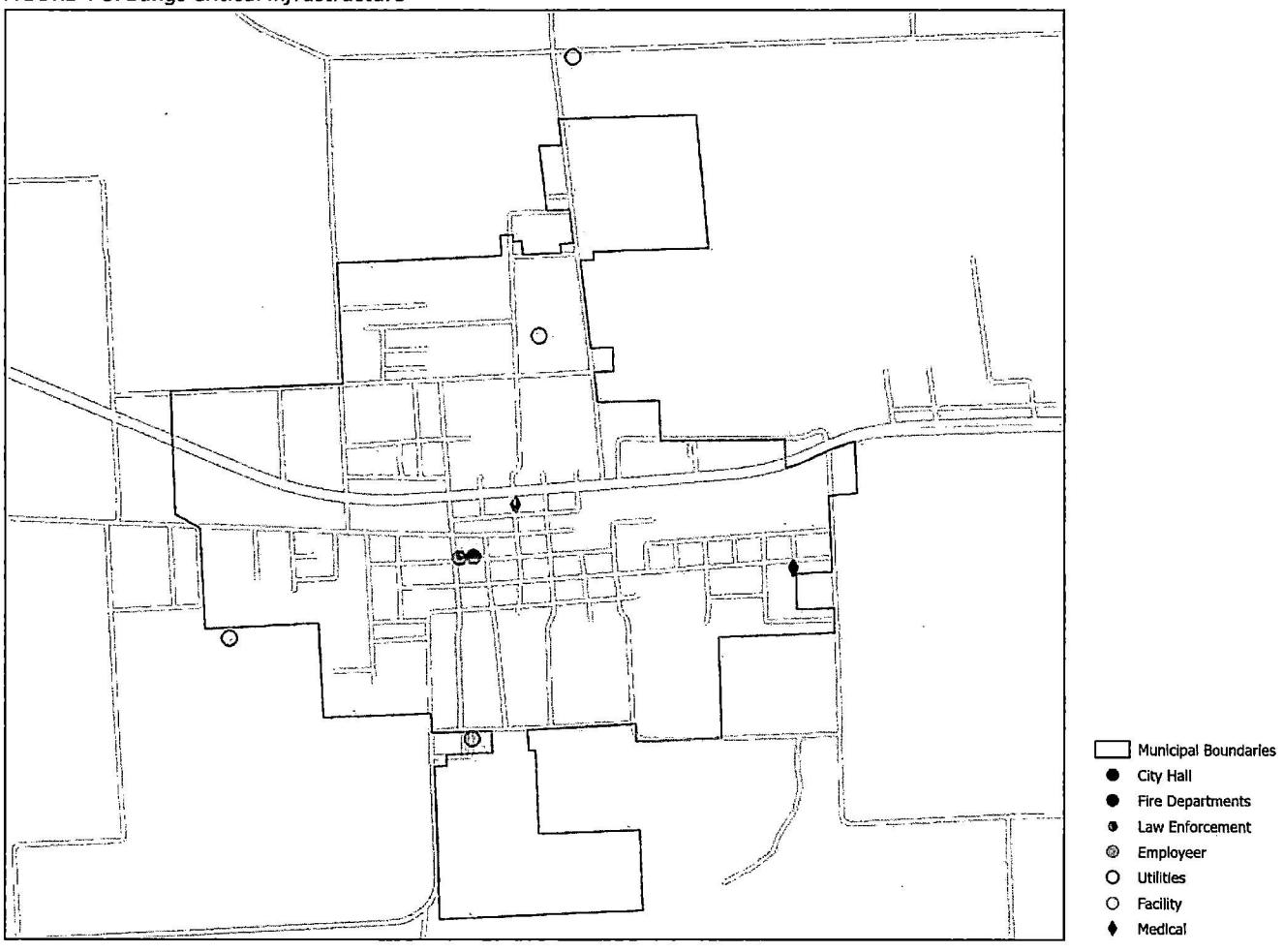


TABLE 4-10. *Bangs Critical Infrastructure*

FACILITY	LATITUDE	LONGITUDE	FACILITY	LATITUDE	LONGITUDE
Bangs City Hall	31°42'52"N	99°07'57"W	*Bangs High School	31°43'03"N	99°07'47"W
Bangs Police Department	31°42'52"N	99°07'57"W	Bangs Food Pantry	31°43'09"N	99°06'56"W
Bangs Volunteer Fire Department	31°42'52"N	99°07'55"W	Bangs Event Center	31°42'27"N	99°07'56"W
City of Bangs Water Plant	31°43'22"N	99°07'45"W	Bangs Medical Clinic	31°42'59"N	99°07'49"W
*Bangs Independent School District	31°43'01"N	99°07'52"W	Bangs Nursing and Rehabilitation Center	31°42'49"N	99°07'11"W
*Bangs Elementary School	31°43'45"N	99°07'36"W	Water Tower	31°42'42"N	99°08'29"W
*Bangs Middle School	31°43'06"N	99°07'49"W	Electrical Transformer	31°44'00"N	99°07'39"W

* Schools and school facilities listed here are mapped on page 36, Independent School District Boundary Lines.
† Communication towers are identified on page 86, Communication and/or Database Failure Hazard Profile.

Blanket

FIGURE 4-4. ***Blanket Critical Infrastructure***

TABLE 4-11. ***Blanket Critical Infrastructure***

FACILITY	LATITUDE	LONGITUDE	FACILITY	LATITUDE	LONGITUDE
Blanket City Hall	31°49'26"N	98°47'14"W	Blanket Community Center	31°49'28"N	98°47'19"W
Blanket Volunteer Fire Department	31°49'26"N	98°47'14"W	City of Blanket Public Water Supply	31°49'50"N	98°47'17"W
*Blanket ISD	31°49'17"N	98°47'32"W	Blanket Wastewater Plant	31°49'02"N	98°47'23"W
*Blanket School	31°49'17"N	98°47'34"W	Blanket General Store	31°49'12"N	98°47'11"W

* Schools and school facilities listed here are mapped on page 36, Independent School District Boundary Lines.
† Communication towers are identified on page 86, Communication and/or Database Failure Hazard Profile.

Brownwood

FIGURE 4-5. *Brownwood Critical Infrastructure*

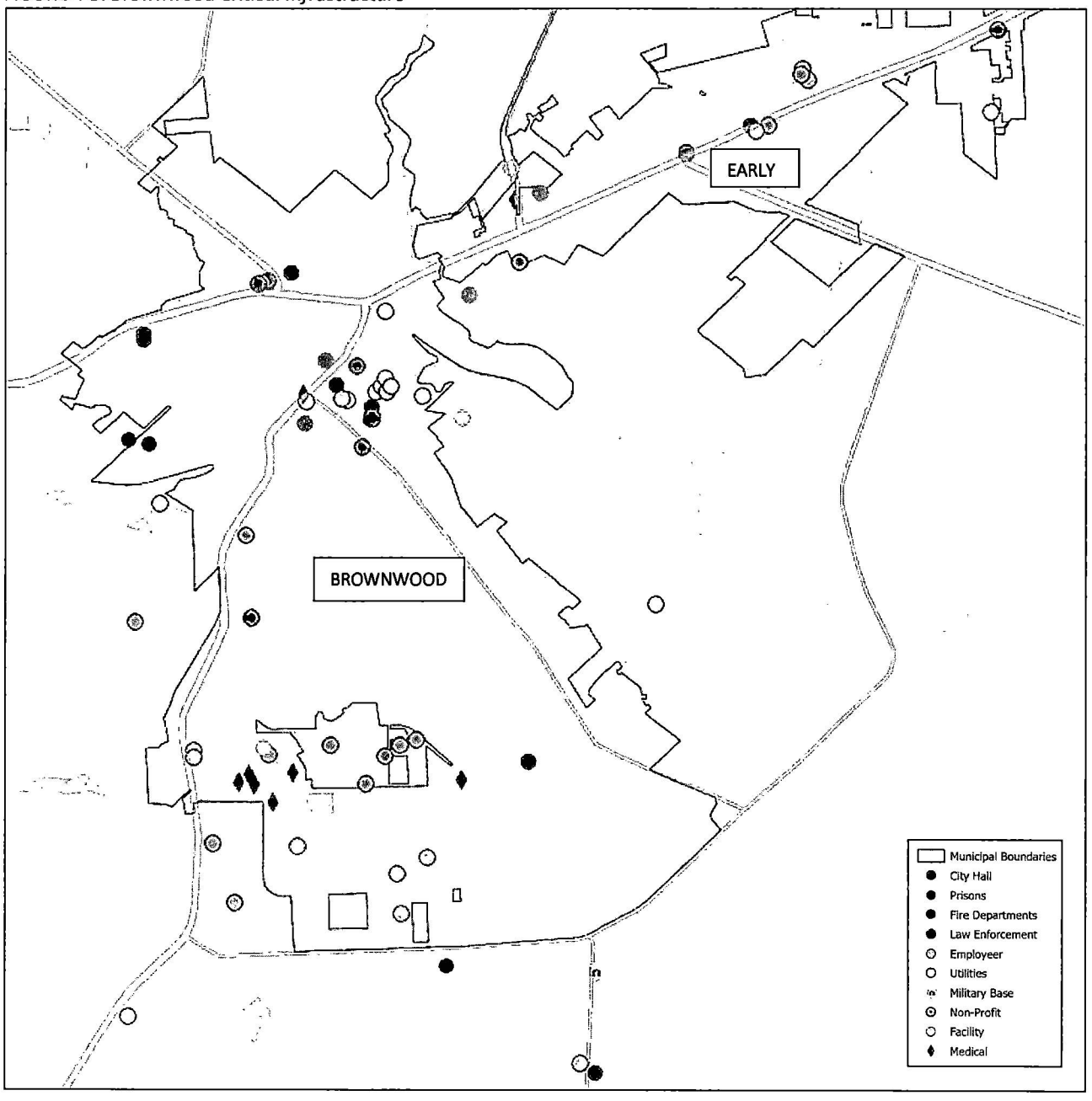


TABLE 4-12. *Brownwood Critical Infrastructure*

FACILITY	LATITUDE	LONGITUDE	FACILITY	LATITUDE	LONGITUDE
Brownwood City Hall	31°43'10"N	98°59'00"W	*Coggin Elementary	31°42'45"N	98°58'53"W
Brownwood Law Enforcement Center	31°43'30"N	99°00'14"W	*Northwest Elementary	31°43'06"N	99°00'12"W
Brownwood Central Fire Station	31°43'01"N	98°58'47"W	*Woodland Heights Elementary	31°40'41"N	98°57'40"W
Brownwood Fire Station 2	31°40'43"N	98°57'51"W	*East Elementary	31°41'44"N	98°57'53"W
Brownwood Public Works	31°40'52"N	99°00'00"W	Bert V Massey Sports Complex	31°39'47"N	98°58'42"W
Brownwood Regional Landfill	31°38'47"N	98°57'35"W	Gordon Wood Stadium	31°40'02"N	98°58'43"W
Brownwood Wastewater Treatment Plant	31°41'42"N	98°57'00"W	Camp Bowie Soccer Complex	31°40'08"N	98°58'31"W
Brownwood Coliseum	31°43'12"N	98°58'41"W	Howard Payne University	31°42'56"N	98°59'13"W
Brownwood Event Center Complex	31°43'07"N	98°58'41"W	Texas State Technical College	31°43'20"N	98°59'04"W
Brownwood Regional Airport (identified on Brown County map)	31°47'35"N	98°57'08"W	Ranger College	31°44'21"N	98°57'39"W
Brownwood Senior Citizen Center	31°43'09"N	98°58'39"W	Brown County Christian School - Victory Life	31°43'43"N	98°58'08"W
Brownwood Area Chamber of Commerce	31°42'57"N	98°58'47"W	Cross Classical Academy (Private)	31°43'03"N	98°58'59"W
3M Company	31°40'16"N	98°59'54"W	Hendrick Medical Center Brownwood	31°40'38"N	98°59'37"W
Kohler Co	31°39'53"N	98°59'46"W	Air Evac LifeTeam	31°40'42"N	98°59'39"W
Wright Asphalt Products	31°40'47"N	98°58'46"W	Lifeguard EMS	31°43'07"N	98°59'13"W
Superior Essex Corp	31°40'37"N	98°58'54"W	Pecan Bayou Nursing & Rehab	31°40'42"N	98°59'22"W
VRC Technologies	31°40'51"N	98°58'40"W	Oak Ridge Manor Skilled Nursing & Rehab	31°40'31"N	98°59'30"W
Performance Pipe	31°40'52"N	98°59'07"W	Songbird Lodge	31°40'49"N	98°59'31"W
Vulcan Materials Company	31°41'42"N	99°00'21"W	Redstone Park	31°40'52"N	98°59'33"W
Canidae, LLC.	31°40'53"N	98°58'34"W	The Chatfield Assisted Living	31°40'37"N	98°58'17"W
Nelson Wholesale Services	31°42'14"N	98°59'37"W	Brownwood Nursing & Rehabilitation	31°40'39"N	98°59'43"W
Pecan Grove Farms	31°49'12"N	98°59'25"W	Big Country Healthcare Services	31°43'17"N	98°58'52"W
Texas Dept. of Transportation	31°44'28"N	98°57'51"W	Center for Life Resources	31°43'51"N	98°59'25"W
Burlington Northern and Sante Fe (BNSF) Railway	31°42'56"N	98°58'12"W	Salvation Army of Brownwood	31°43'50"N	98°59'29"W
Camp Bowie Army National Guard	31°39'22"N	98°57'28"W	The ARK	31°41'42"N	98°59'36"W
Texas Department of Criminal Justice (TDCJ) Havins Unit	31°39'26"N	98°58'25"W	American Red Cross	31°42'46"N	98°58'51"W
Texas Juvenile Justice Department (TJJD) Ron Jackson State Juvenile Correctional Complex	31°42'50"N	99°00'13"W	Brown County United Way	31°42'46"N	98°58'51"W
Texas Juvenile Justice Department (TJJD) The Oaks Rite of Passage Facility	31°42'52"N	99°00'21"W	Oncor Electric Delivery	31°43'05"N	98°58'27"W
*Brownwood Independent School District	31°41'27"N	98°58'20"W	Atmos Energy Corporation	31°40'14"N	98°59'21"W
*Brownwood Accelerated High School	31°41'28"N	98°58'21"W	Comanche Electric Coop. Assoc. /Western Division	31°46'24"N	98°56'57"W
*Brownwood High School	31°41'30"N	98°58'44"W	Wendlee Broadcasting	31°43'04"N	98°58'56"W
*Brownwood Premier High School	31°44'24"N	98°57'00"W	KOXE/KBWD Radio Station	31°43'07"N	98°58'45"W
*Brownwood Intermediate School	31°42'46"N	98°58'58"W	KPSM 99.3 - The Rock	31°43'04"N	98°59'12"W

* Schools and school facilities listed here are mapped on page 36, Independent School District Boundary Lines.
† Communication towers are identified on page 86, Communication and/or Database Failure Hazard Profile.

Early

FIGURE 4-6. *Early Critical Infrastructure*

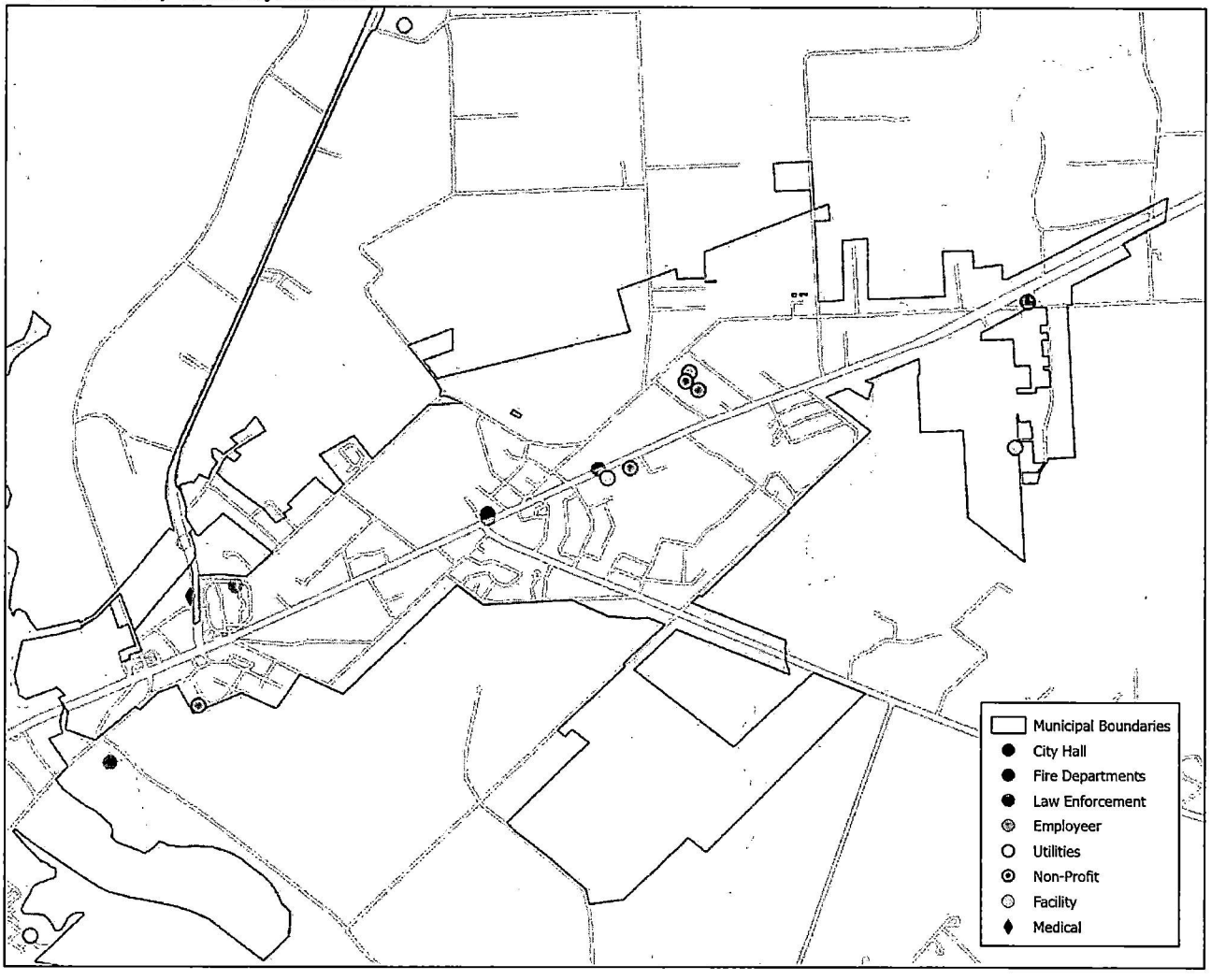


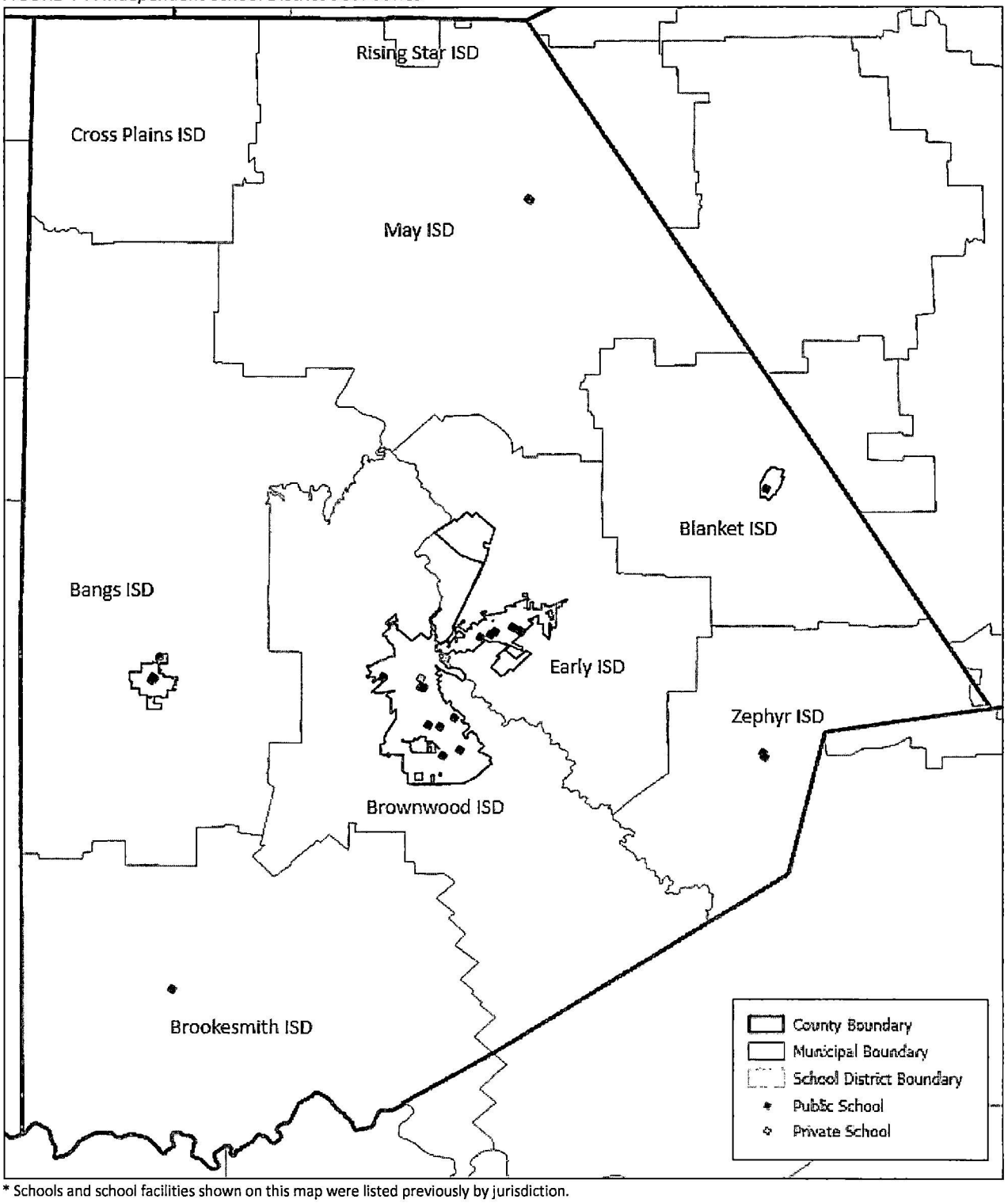
TABLE 4-13. *Early Critical Infrastructure*

FACILITY	LATITUDE	LONGITUDE	FACILITY	LATITUDE	LONGITUDE
Early City Hall	31°44'35"N	98°56'42"W	Early Glass/Brownwood Door	31°45'01"N	98°55'54"W
Early Police Department	31°44'34"N	98°56'42"W	*Early ISD	31°44'36"N	98°56'30"W
Early Fire Station	31°44'44"N	98°56'17"W	*Early Highschool	31°44'44"N	98°55'56"W
City of Early Water Tower	31°44'46"N	98°54'44"W	*Early Middle School	31°44'38"N	98°55'45"W
Solaris Oilfield	31°43'55"N	98°57'48"W	*Early Elementary School	31°44'35"N	98°55'40"W
Sweetwater Steel	31°44'44"N	98°56'10"W	*Early Primary School	31°44'31"N	98°56'39"W
Central Texas Rural Transit District	31°44'42"N	98°56'15"W	Hendrick Clinic Early	31°44'19"N	98°57'49"W
Bishop Distributing/Sunbeater Co	31°45'05"N	98°55'56"W	Heart of Texas Baptist Network	31°45'18"N	98°54'40"W
Rodgers Machining	31°45'03"N	98°55'57"W			

* Schools and school facilities listed here are mapped on page 36, Independent School District Boundary Lines.
† Communication towers are identified on page 86, Communication and/or Database Failure Hazard Profile.

Independent School District Boundary Lines

FIGURE 4-7. *Independent School District Boundaries*[22]



* Schools and school facilities shown on this map were listed previously by jurisdiction.

[22] https://www.arcgis.com/home/item.html?id=95738ddb2b784336a60aff23312ff480

Vulnerability Summary

44 CFR REQUIREMENT

Requirement 44 CFR § 201.6(c)(2)(ii) The plan includes a summary of the jurisdiction's vulnerability and the impacts on the community from the identified hazards.

Requirement 44 CFR § 201.6(c)(2)(ii) The plan describes the effects of future conditions, including climate change (i.e. long-term weather patterns, average temperature, and sea levels), on the type, location, and range of anticipated intensities of identified hazards.

The vulnerability assessment used a 1-10 scale, with 1 indicating extreme low susceptibility and 10 indicating extreme high susceptibility to hazards. Brookesmith ISD assessed and calculated the weighted risk scores based on TxSSC. The Brown County vulnerability assessment identified an overall value of 5.64. Medium susceptibility is defined as having weaknesses within the POETE solution cycle or model for emergency management (planning, organizing, equipping, training, and exercising) that identifies a lack of protection measures or redundancies. Brown County is moderately vulnerable to the identified hazards and risks. The Bangs vulnerability assessment identified an overall value of 4.53. Bangs is moderately vulnerable to the identified hazards and risks. The Blanket vulnerability assessment identified an overall value of 2.0. Blanket is minimally vulnerable to the identified hazards and risks. The Brookesmith ISD vulnerability assessment was conducted using a different format provided by the TxSSC. Weighted scores related to the probability that the hazard will impact the school district, the impact to life safety, the impact to property, and the impact to district operations were determined to assess an overall vulnerability to each identified hazard. The Brownwood vulnerability assessment identified an overall value of 4.32. Brownwood is moderately vulnerable to the identified hazards and risks. The Early vulnerability assessment identified an overall value of 5.74. Early is moderately vulnerable to the identified hazards and risks.

Effects of Climate Change, Population Trends, and Land Use Change

Climate change is defined as a long-term hazard which can increase or decrease the risk of other weather-related 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. Paleoclimate records also show that the climate over this region has experienced large changes between periods of droughts. While the cause of these fluctuations is unclear, anticipating how such changes could impact risk could improve mitigation efforts. Climate change was evaluated within the risk assessment and the results indicated that Brown County and the participating jurisdictions were not significantly concerned with the impacts of climate change on current or future natural hazards at this time. Population and land use data and trends suggest minimal changes will occur resulting in statistically insignificant impacts on the vulnerability of participating jurisdictions to natural hazards. The effects of climate change, population shifts, and land use changes on vulnerability will continue to be assessed through HMAP evaluations and updates.

Risk Summary

The identified hazards have the potential to cause harm, while the correlating risk is the likelihood of that harm occurring. Risk is the product of the scope of the hazard and the probability of it occurring. The outcome depends on the situation and how exposed, or vulnerable, the person, property, or jurisdiction is to that hazard. The following charts reflect the risk assessment results for natural, technological, and human caused hazards within each participating jurisdiction. The risk assessment included a description of the general vulnerability and consequence (human impact and economic impact).

Probability = Vulnerability x Threat (P = V x T)
Consequence = Human Impact x Economic Impact (C = HI x EI)
Risk = Probability x Consequence = Vulnerability x Threat x Consequence (R = P x C = V x T x C)

Vulnerability (V) is the total susceptibility of assets subject to damages from a hazard, based on historic recorded damages, weaknesses identified within the POETE (planning, organizing, training, equipping, and exercising) solution cycle, and protection measures or redundancies needed to remain operational. Assets in the region were inventoried and defined in hazard zones where appropriate. The total amount of damages, including property and crop damages, for each hazard was theoretically divided by the total number of assets (building value totals) in that community to determine the percentage of damage that each hazard could cause to the community.

Consequence (C) is relative to the total asset population (human impact (HI)) and relative to the total asset value (economic impact (EI)). It is determined through evaluating number and types of potential victims, cost to replace asset, cost to respond, and cost to recover. These values were factored along with the likelihood that the hazard, or threat (T), would occur within the next twelve (12) months.

BROWN COUNTY

FIGURE 4-8. *Brown County Natural Hazard Risk Assessment*

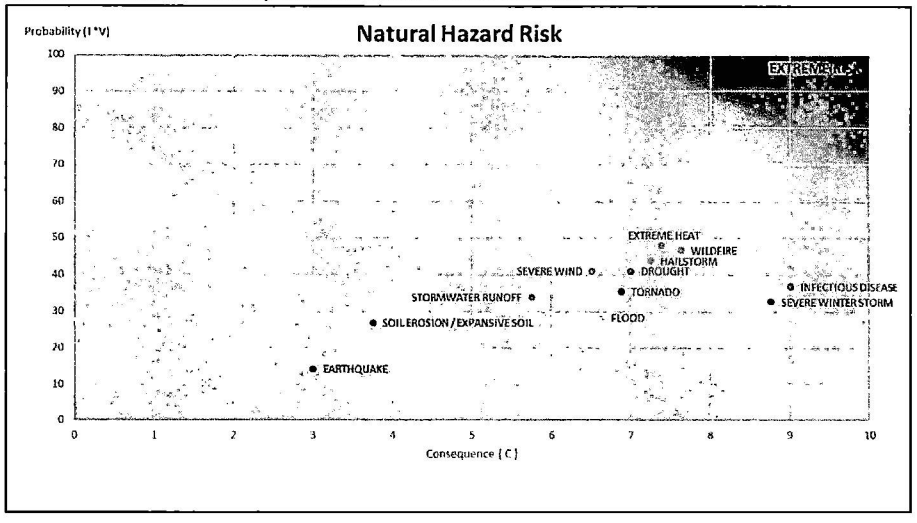


FIGURE 4-9. *Brown County Technological Hazard Risk Assessment*

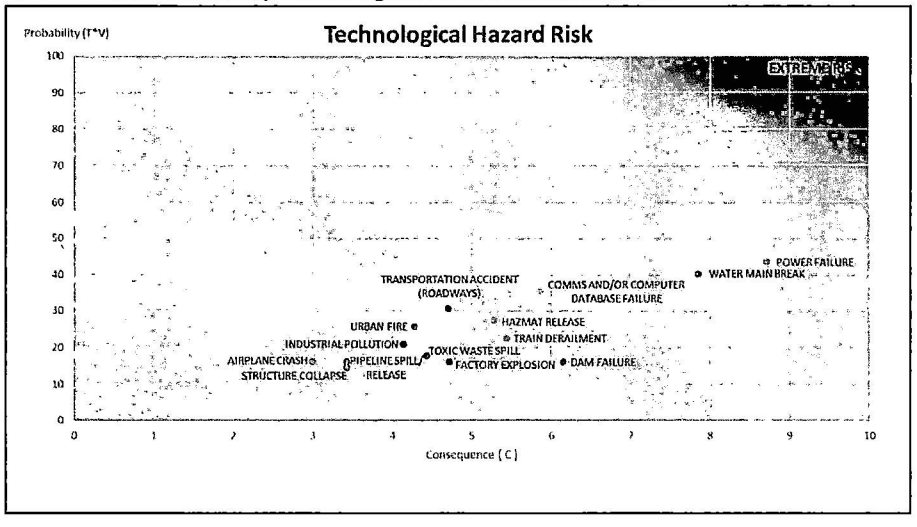
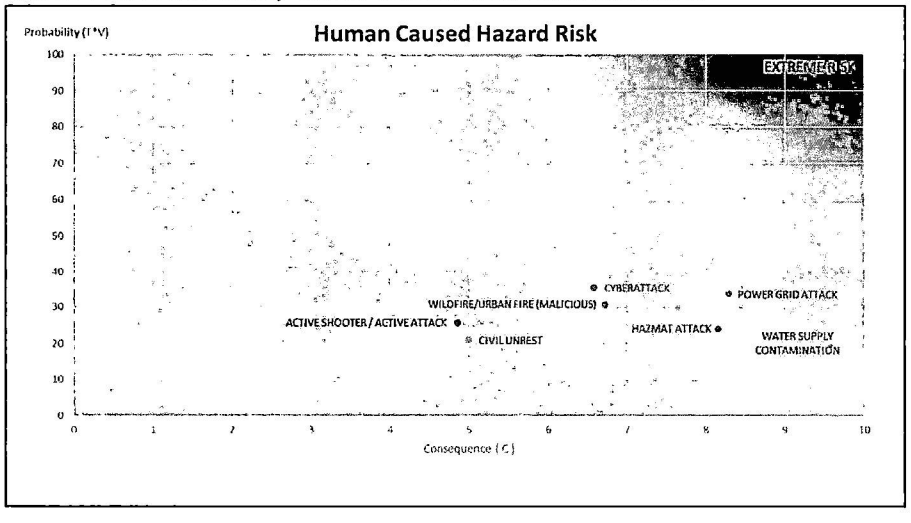


FIGURE 4-10. *Brown County Human Caused Hazard Risk Assessment*



BANGS

FIGURE 4-11. *Bangs Natural Hazard Risk Assessment*

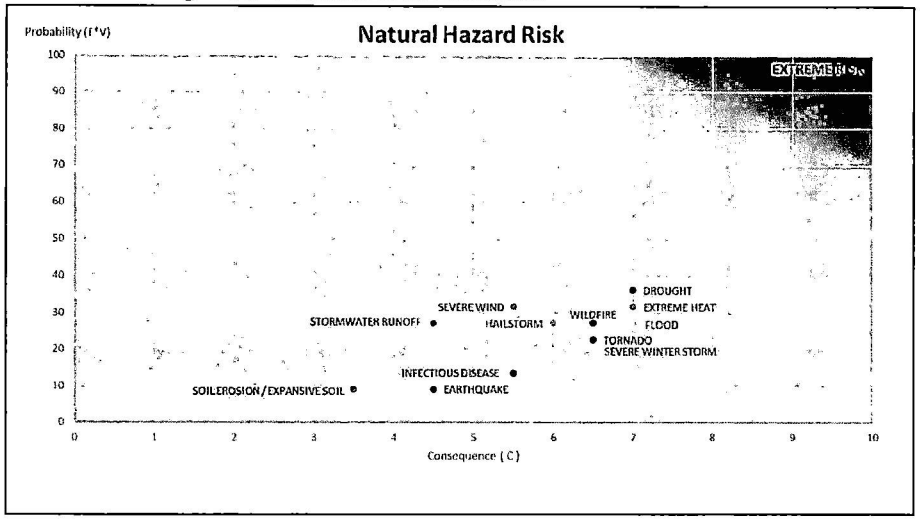


FIGURE 4-12. *Bangs Technological Hazard Risk Assessment*

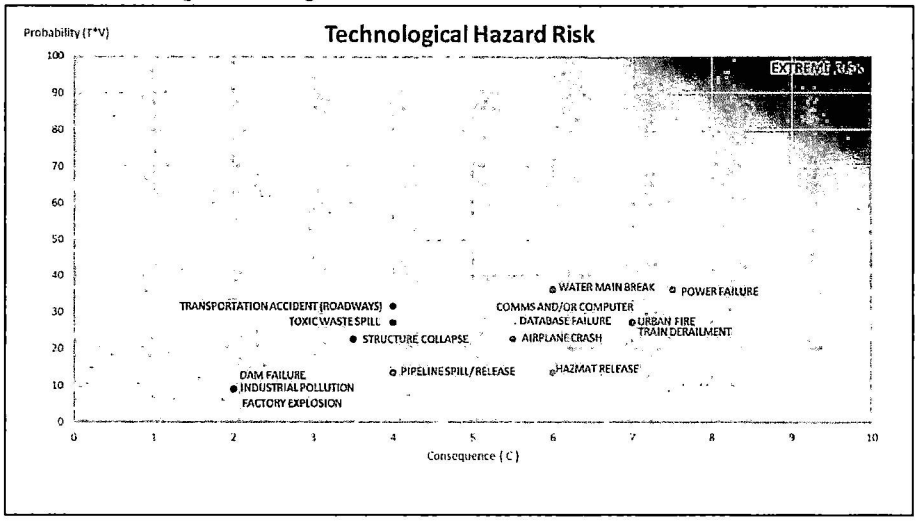
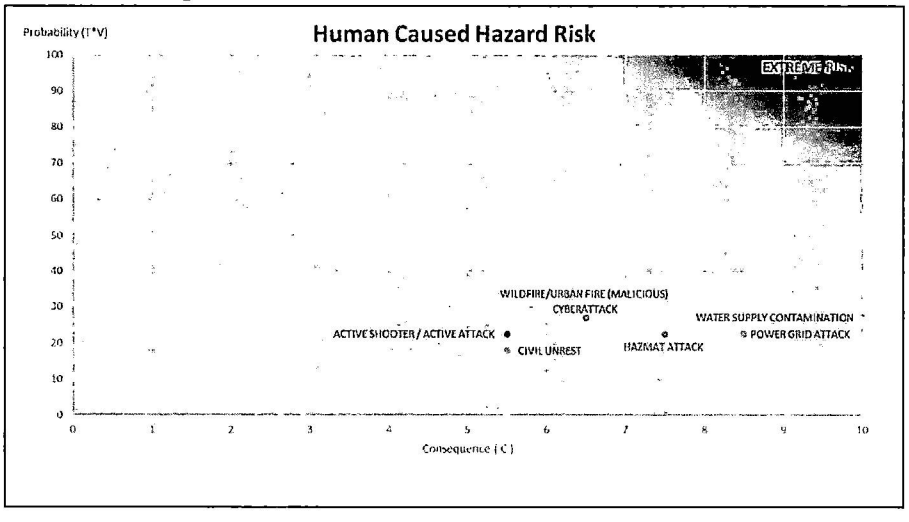


FIGURE 4-13. *Bangs Human Caused Hazard Risk Assessment*



BLANKET

FIGURE 4-14. *Blanket Natural Hazard Risk Assessment*

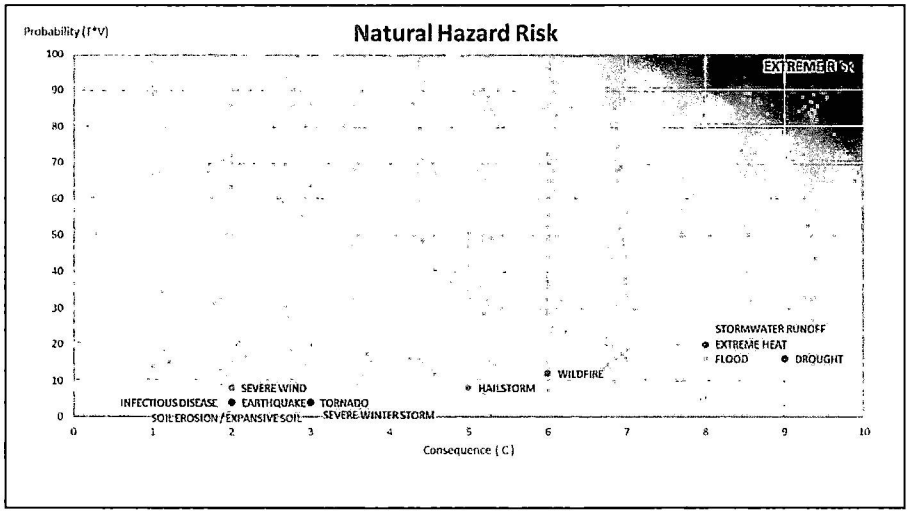


FIGURE 4-15. *Blanket Technological Hazard Risk Assessment*

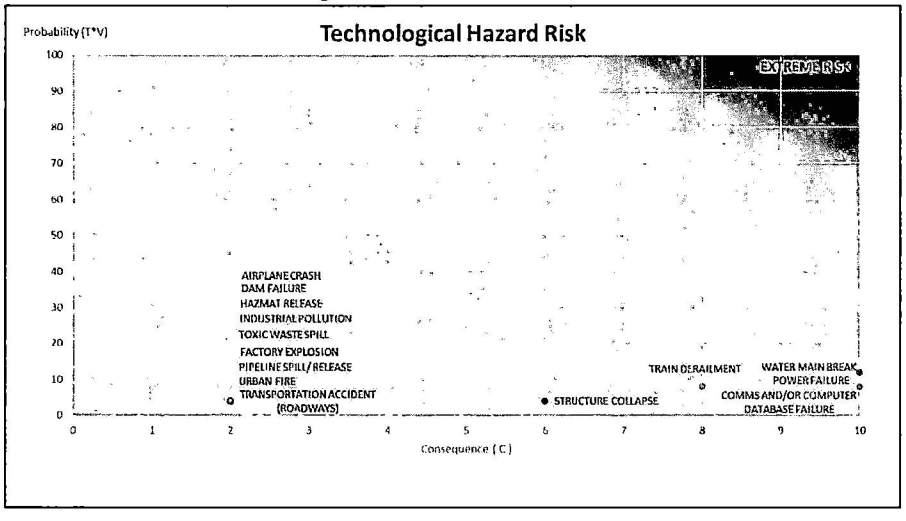
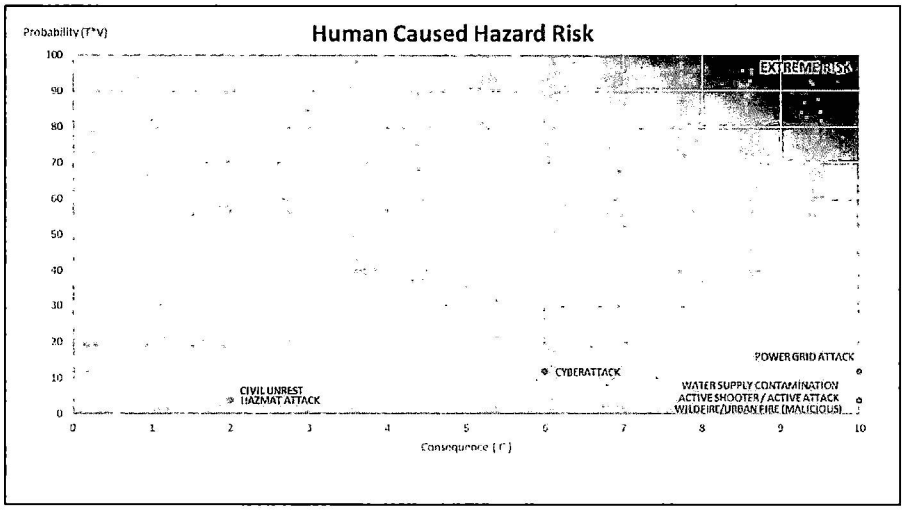


FIGURE 4-16. *Blanket Human Caused Hazard Risk Assessment*



BROWNWOOD

FIGURE 4-17. *Brownwood Natural Hazard Risk Assessment*

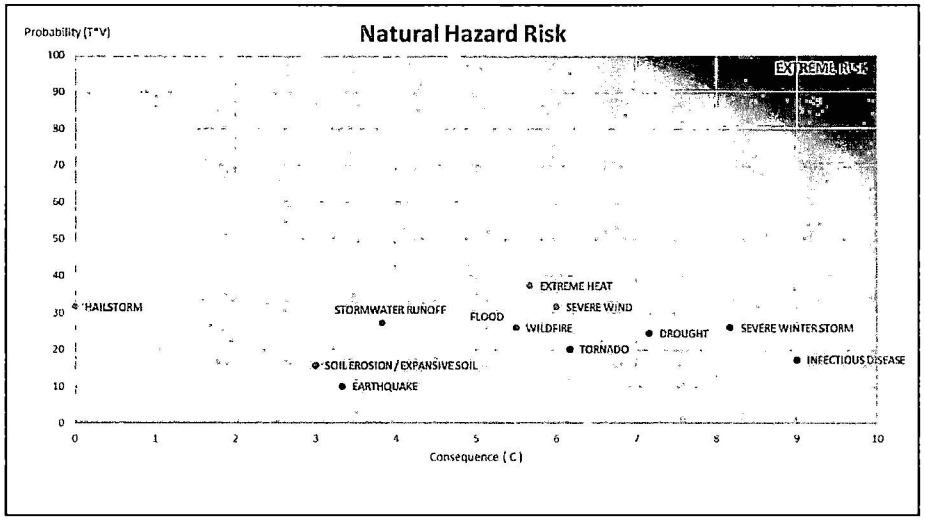


FIGURE 4-18. *Brownwood Technological Hazard Risk Assessment*

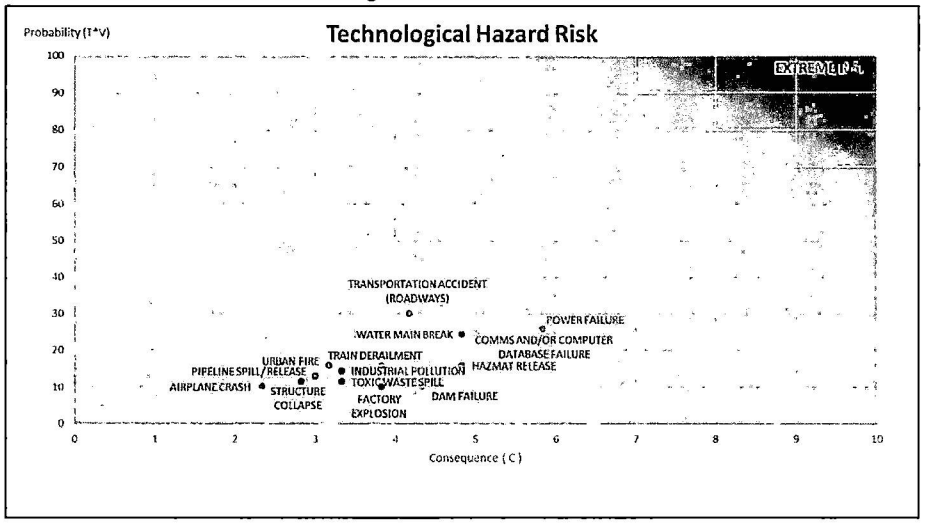
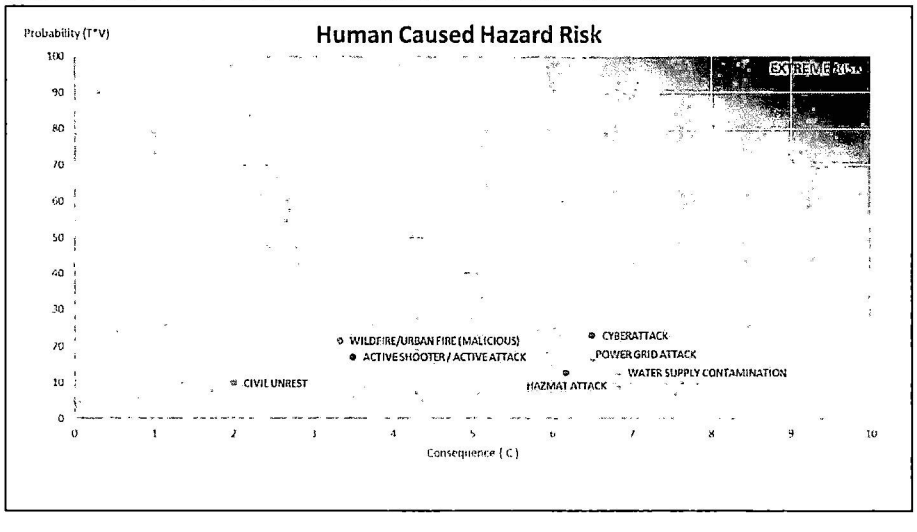


FIGURE 4-19. *Brownwood Human Caused Hazard Risk Assessment*



EARLY

FIGURE 4-20. *Early Natural Hazard Risk Assessment*

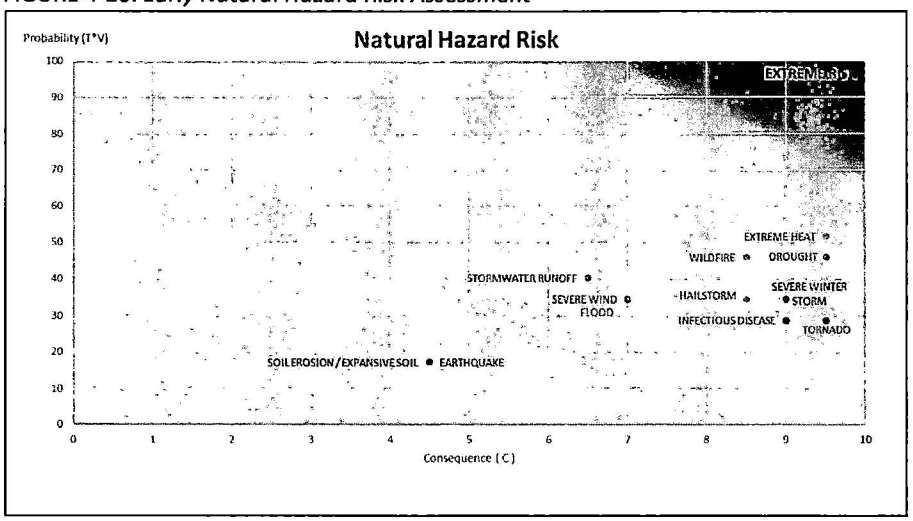


FIGURE 4-21. *Early Technological Hazard Risk Assessment*

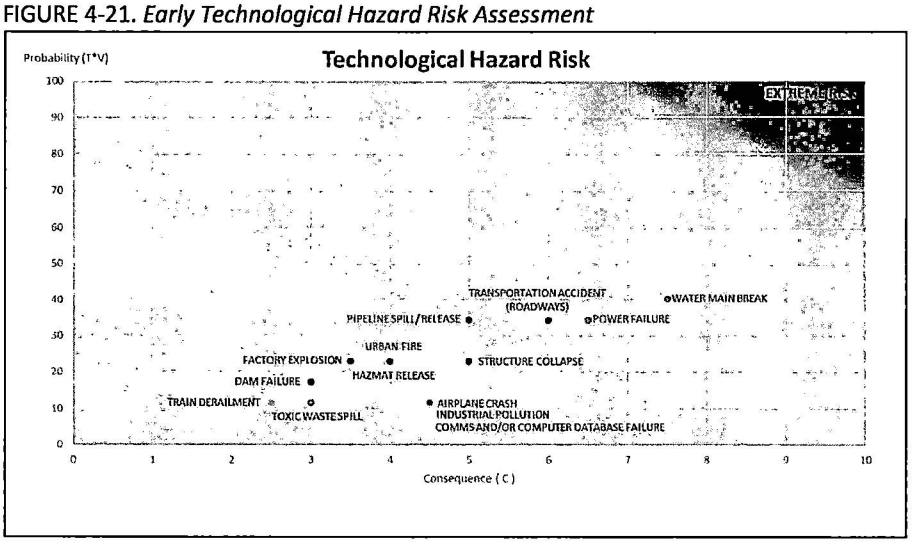
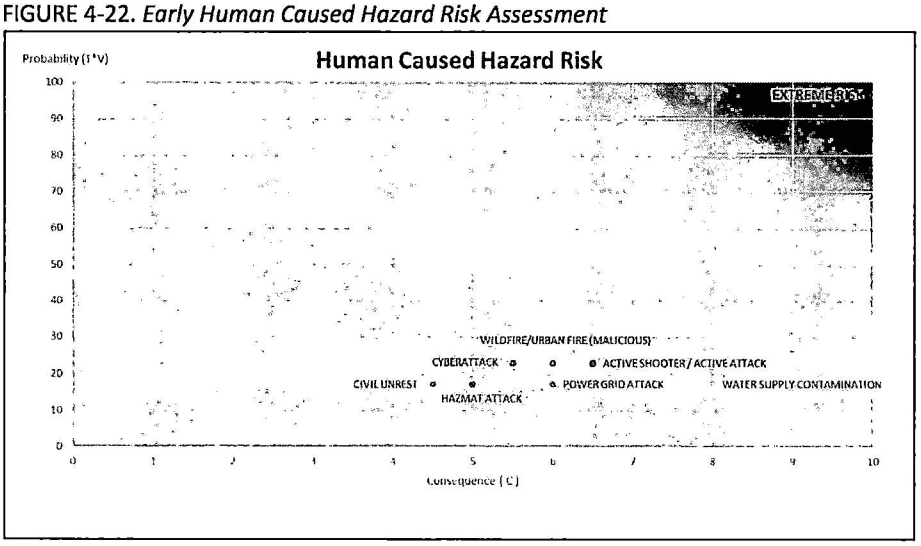


FIGURE 4-22. *Early Human Caused Hazard Risk Assessment*



BROOKESMITH ISD

TABLE 4-14. *Brookesmith ISD Hazard Risk Assessment*

Hazard	Probability (0-9)	"Severity of Impact – Life Safety (0-10)"	Severity of Impact – Property (0-3)	"Severity of Impact – District Operations (0-6)"	Total Score
Active Shooter (Attacker)	1	10	2	6	19
Chemical Plant Release	0	0	0	0	0
Communicable Disease	2	6	1	3	12
Cyber Attack/Ransomware	3	2	1	4	10
Earthquake	1	1	1	1	4
Flooding	1	1	1	2	5
Highway Accident/HAZMAT	2	3	2	3	10
Hurricane/Tropical Storm	0	0	0	0	0
Major Utility Loss	3	3	2	4	12
Pipeline Release	0	0	0	0	0
Severe Thunderstorm	5	6	2	5	18
Tornado	3	10	3	6	22
Train Derailment	0	0	0	0	0
Wildfire	3	6	3	6	18
Winter Storm	2	4	3	5	14

SECTION 5: CAPABILITY ASSESSMENT

44 CFR REQUIREMENT

Requirement 44 CFR § 201.6(c)(3) The plan documents each participant's existing authorities, policies, programs, and resources, and its ability to expand on and improve these existing policies and programs.

Requirement 44 CFR § 201.6(c)(3) The plan describes how the existing capabilities of each participant are available to support the mitigation strategy. The plan includes a discussion of the existing building codes and land use and development ordinances or regulations.

A Community Capability Assessment is an integral component of the HMAP process. It is an invaluable tool in assessing a community's existing planning and regulatory capabilities to support implementation of mitigation strategy objectives. The completed Capability Assessment Checklist provides information on existing policies, plans, and regulations at the local level and are denoted with an "x". Response resources were evaluated to examine the type, number, and description of available resources within each participating jurisdiction. Brown County and Brookesmith ISD do not have existing building codes, land use, and development ordinances; however, they are obligated to adhere to state and federal guidelines. Bangs, Blanket, Brownwood, and Early have existing building codes, land use, and development ordinances that support increased safety and protection of life and property. Discussions have occurred within each city that address the status of existing and future needs.

Evaluation of Capabilities

TABLE 5-1. *Jurisdiction Capability Assessment*

	COUNTY	BANGS	BLANKET	BROWNWOOD	EARLY	BROOKESMITH ISD
PLANS						
Capital Improvements Plan			X	X	X	X
Community Wildfire Protection Plan	X	X	X	X	X	X
Continuity of Operations			X			X
Economic Development Plan		X		X	X	
Emergency Operations Plan	X		X	X	X	X
Evacuation Plan	X				X	
Hazard Mitigation Plan	X	X	X	X	X	X
Historic Preservation Plan	X		X			
Land Use Plan				X	X	
Master or Comprehensive Plan		X				
Open Space Plan						
Post-Disaster Recovery Plan						
Redevelopment Plan					X	
Stormwater Management Plan					X	
Transportation Plan	X					X
Watershed Protection Plan						
POLICIES / ORDINANCES						
Building Codes		X	X	X	X	
Floodplain Ordinance	X	X	X	X	X	
Property Set-Back Ordinance		X	X	X	X	
Real Estate Disclosure Requirements						
Site Plan Review Requirements				X	X	
Stormwater Ordinance				X	X	
Subdivision Regulations				X	X	
Watershed Ordinance				X		
Zoning Ordinance/ Land Use Restrictions			X	X	X	
PROGRAMS						
Fire Code		X		X	X	
Floodplain Maps/ Flood Insurance Studies	X	X	X	X	X	
Hydrologic/ Hydraulic Studies				X		
Mutual Aid Agreements	X		X	X	X	
NFIP Participant	X	X	X	X	X	
NFIP CRS Participant			X			
Property Acquisition Program						
Public Education/ Awareness Programs	X		X	X	X	

TABLE 5-1, CONTINUED. *Jurisdiction Capability Assessment*

	COUNTY	BANGS	BLANKET	BROWNWOOD	EARLY	BROOKESMITH ISD
Storm Drainage Systems Maintenance						
Stream Maintenance Program	X			X	X	
STAFF / DEPARTMENTS						
Building Code Official		X		X	X	
Emergency Manager	X	X	X	X	X	
Engineer/ Public Works Official		X	X	X		
Environmental Conservation Specialist						
Floodplain Administrator	X	X	X	X	X	
Geo-Information Systems Specialist				X	X	
Planner/ Planning Department			X		X	
Public Information Official			X	X	X	X
Resource Development/ Grant Writer	X	X				X
County Health Department	X	X	X	X	X	X

Evaluation of Response Resources

Specific response resources were assessed within each jurisdiction to ascertain the capabilities of key personnel, assets, and departments to respond to hazard events within and across the participating jurisdictions. The following resources and capabilities of each participating jurisdiction are available to support the mitigation strategy and hazard events.

TABLE 5-2. *Jurisdiction Resource Assessment*

	COUNTY	BANGS	BLANKET	BROWNWOOD	EARLY	BROOKESMITH ISD
LAW ENFORCEMENT RESOURCES						
PD Officers	NA	<10	<10	10 - 50	<10	NA
SO Deputies	10 - 50	NA	NA	NA	NA	NA
SWAT Officers	YES	Regional Asset from Brown County/ Brownwood	Regional Asset from Brown County/ Brownwood	Regional Asset from Brown County/ Brownwood	Regional Asset from Brown County/ Brownwood	Regional Asset from Brown County/ Brownwood
SERT	0	NA	NA	NA	NA	NA
FIRE DEPARTMENT RESOURCES						
VFDs	6-10	1	1	0	1	NA
Paid FDs	NA	0	0	2	0	NA
Bomb Squad Response	Brownwood	Brownwood	Brownwood	Brownwood	Brownwood	Brownwood
HAZMAT Response	Brownwood	Brownwood	Brownwood	Brownwood	Brownwood	Brownwood
Vehicles/ Assets	6 Tankers, 10 Structural Engines, 5 Rescue, 20 Wildland Engines	27 firefighter volunteers; 3 non-firefighter volunteers	NA	4 Engines 1 Ladder 4 Brush Trucks 1 Boat 3 Command Vehicles	2 Pumpers 1 Tanker 1 Rescue 4 Brush Trucks 1 Mule	NA
EMS RESOURCES						
Ambulances Operating in Jurisdiction	1-5	NA	NA	NA	NA	NA
# of Personnel	2	NA	NA	NA	NA	NA
Highest Level of Qualification	EMT	NA	NA	NA	NA	NA
Specialized EMS Equipment	AIR EVAC Helicopter	NA	NA	NA	NA	NA
EMS Organization	Lifeguard/ AMR EMS	NA	NA	NA	NA	NA

TABLE 5-2, CONTINUED. *Jurisdiction Resource Assessment*

	COUNTY	BANGS	BLANKET	BROWNWOOD	EARLY	BROOKESMITH ISD
COMMUNICATION RESOURCES						
Type (UHF/VHF/P25)	Combination	Combination	Combination	Combination	Combination	NA
System	County	County	County	County	County	NA
Interoperability	State	County	County	State	County	NA
Deployed Personnel	Personnel Issued Radio	Personnel Issued Radio	Personnel Issued Radio	Personnel Issued Radio	Personnel Issued Radio	NA
Concerns/ Needs	Interop; Coverage	Interop; Coverage	Interop; Coverage	Interop; Coverage	Interop; Coverage	Direct Line to Dispatch
HOSPITAL RESOURCES						
Hospital Bed Capacity	188 Licensed Beds	NA	NA	188 Licensed Beds	NA	NA
Specialized Equipment for MCI	Decon Shower BCHCC Partner	NA	NA	Decon Shower BCHCC Partner	NA	NA
Staffing Levels	At Census	NA	NA	NA	NA	NA
HAZMAT Capabilities	1 DECON Shower	NA	NA	1 DECON Shower	NA	NA
Resource Overwhelming Scenario	MCI	MCI	MCI	MCI	MCI	NA
ADDITIONAL RESOURCES						
72-Hr Stockpile of Resources	YES	NO	NO	YES	NO	NA
Dedicated IT Department	YES	YES	YES	YES	YES	YES
Mutual Aid Agreements	YES	YES	YES	YES	YES	YES
Emergency Procurement Policy	YES	YES	YES	YES	YES	NA
Emergency Pay Policy	YES	NO	NO	YES	NO	NA
Conduct/ Track Energy Conservation Activities	NO	NO	NO	NO	NO	NA
Conduct/ Track Water Conservation Activities	YES	NO	NO	YES	YES	NA
Community Emergency Response Team	YES	NO	NO	YES	YES	NA
MRC	YES	NO	NO	YES	YES	NA
Operation Disrupting Scenario	Dam Failure ; Infectious Disease ; Resource relocation; CI damage/ limited capabilities	Train Derailment Server Weather / Tornado	Wildfire; Tornado	Outbreak, Fire, Flood, Utility Loss; Cyber Attack, , Biological Attack, Severe Damage to CI	Active Shooter / MCI Hostage Situation within City Hall/ Courthouse	Active Attack; Tornado

Capability Needs/Challenges

Creating a hazard mitigation plan involves identifying both the capabilities needed and the challenges that might be encountered. Each participating jurisdiction recognizes the importance of identifying, expanding, and improving the existing capabilities to achieve mitigation goals. These are addressed within the identified mitigation actions in Section 8. Some key points that were considered include:

Capability Needs:

1. Risk Assessment Tools: Implement advanced tools and technologies for accurate hazard assessment and mapping.
2. Data Collection and Analysis: Develop robust systems for gathering and analyzing data on past events, vulnerabilities, and potential impacts.
3. Interagency Coordination: Foster effective communication and collaboration among local, state, and federal agencies.
4. Public Education and Outreach: Establish programs to educate the public about risks and mitigation strategies.
5. Funding and Resources: Secure adequate financial resources and materials to implement mitigation measures.
6. Technical Expertise: Employ skilled personnel with expertise in engineering, environmental science, urban planning, and emergency management.
7. Community Involvement: Engage local communities in planning and decision-making processes.
8. Regulatory Framework: Strengthen policies and regulations to support mitigation efforts.
9. Mapping: Obtain inundation zone mapping, flood height mapping, and track repetitive loss properties by FEMA-designated loss categories, location, use, and construction type.

Challenges:

1. Funding Limitations: Overcome challenges in securing sufficient funding for comprehensive mitigation projects.
2. Data Gaps: Address issues related to incomplete or outdated data that can hinder accurate risk assessments.
3. Interagency Coordination: Ensure seamless cooperation among various agencies and stakeholders.
4. Public Awareness: Tackle public apathy or resistance to mitigation measures.
5. Changing Hazards: Adapt to evolving threats due to climate change or other factors.
6. Regulatory Hurdles: Navigate complex regulatory requirements and obtain necessary permits.
7. Resource Allocation: Prioritize resources effectively among competing needs.
8. Technological Barriers: Keep up with advancements in technology and integrate them into mitigation strategies.

Addressing Needs and Challenges: To develop a robust and effective hazard mitigation plan, it is crucial to address these needs and challenges. Planning and regulatory capabilities are particularly impactful in enabling municipalities or utilities to plan and develop in a disaster-resilient manner. The City of Brownwood already has critical capabilities related to planning and development, such as Capital Improvement Programs, subdivision ordinances, comprehensive plans, transportation plans, and zoning codes. In smaller communities, many critical municipal functions and roles are often carried out by individuals who wear multiple hats. While this can be cost-effective, it may lead to roles being filled by those who are not experts in all required areas. This often necessitates contracting with outside consultants who may lack local knowledge and background. To address this, local focus should be placed on hiring planning, GIS, and building official personnel or developing these capabilities through grants and other means.

Studies should be conducted to identify gaps in capabilities and compare them with other communities of similar size and economy. Currently, communities in the planning area utilize a variety of means to meet these capability needs. Exploring fiscal mechanisms to fund growth, such as drainage utility fees and impact fees, is also essential. Lastly, strengthening educational programs and literature related to hazard mitigation within all municipalities, including close coordination with local school districts, is vital. Actions that can expand and improve existing authorities, plans, policies, and resources for mitigation include budgeting and passing policies and procedures for mitigation actions, adopting and implementing stricter mitigation regulations, approving the hiring and training of staff for mitigation activities, and approving mitigation updates to existing plans as new needs are recognized.

Although the participating jurisdictions strived to engage vulnerable populations, improvements in this area remain necessary. Throughout the planning and implementation processes of the HMAP, the participating jurisdictions have and will continue to conduct community outreach with individuals and organizations that represent, advocate for, and/or interact with underserved and vulnerable communities.

SECTION 6: HAZARD PROFILES

44 CFR REQUIREMENT
Requirement 44 CFR § 201.6(c)(2)(i) The plan includes a description of the type, location, and extent of all natural hazards that can affect the jurisdiction. The plan includes information on previous occurrences of hazard events and on the probability of future hazard events.
Requirement 44 CFR § 201.6(c)(2)(i) The plan includes information on the location of each identified hazard.
Requirement 44 CFR § 201.6(c)(2)(i) The plan describes the extent for each identified hazard.
Requirement 44 CFR § 201.6(c)(2)(i) The plan includes the history of previous hazard events for each identified hazard.
Requirement 44 CFR § 201.6(c)(2)(i) The plan includes the probability of future events for each identified hazard. The plan describes the effects of future conditions, including climate change (i.e. long-term weather patterns, average temperature, and sea levels) on the type, location, and range of anticipated intensities of identified hazards.
Requirement 44 CFR § 201.6(c)(2)(i) For participating jurisdictions in a multi-jurisdictional plan, the plan describes hazards that are unique to and/or vary from those affecting the overall planning area, if applicable.
Requirement 44 CFR § 201.6(c)(2)(ii) The plan provides an overall summary of each jurisdiction's vulnerability to the identified hazards.
Requirement 44 CFR § 201.6(c)(2)(ii) The plan describes the potential impacts of each of the identified hazards on each participating jurisdiction.

Natural Hazards

Brown County[23] has a moderate natural disaster risk score of 37%, with a low average storm events risk score of 24.6% (distribution places tornadoes at 50%, hailstorms at 39%). 58% of Brown County has a moderate or higher wildfire hazard potential (1% very high, 18% high, 39% moderate, 29% low, 13% very low, while its 5% average earthquake risk score is very low (a modified Mercalli Intensity index of 4 and would be light and felt indoors by many, and/or felt outdoors by few)[24]. The average summer temperature is expected to rise by 2.2 Fahrenheit degrees by 2100, which could affect wildfire hazard in the coming decades. Brown County has a moderate societal risk score of 35% and a low average crime risk score of 26% to account for the low to moderate concern for human caused hazards during the risk assessment.

Probability of Future Events: the likelihood of the hazard occurring, or reoccurring, may be defined in historical frequencies, statistical probabilities, hazard probability maps and/or general descriptions. Unlikely reflects a low chance of occurrence (it is not impossible, but the odds are against it based on historical data). Likely suggests a good chance of occurrence (it is not guaranteed, but the odds lean toward it). Highly likely suggests an almost certain chance of occurrence (nearly guaranteed).

FIGURE 6-1. Natural Disaster Score (Moderate)

FIGURE 6-2. Storm Events Score (Low)

[23] https://www.augurisk.com/risk/state/texas/brown-county/48049
[24] https://www.usgs.gov/

EXTREME HEAT

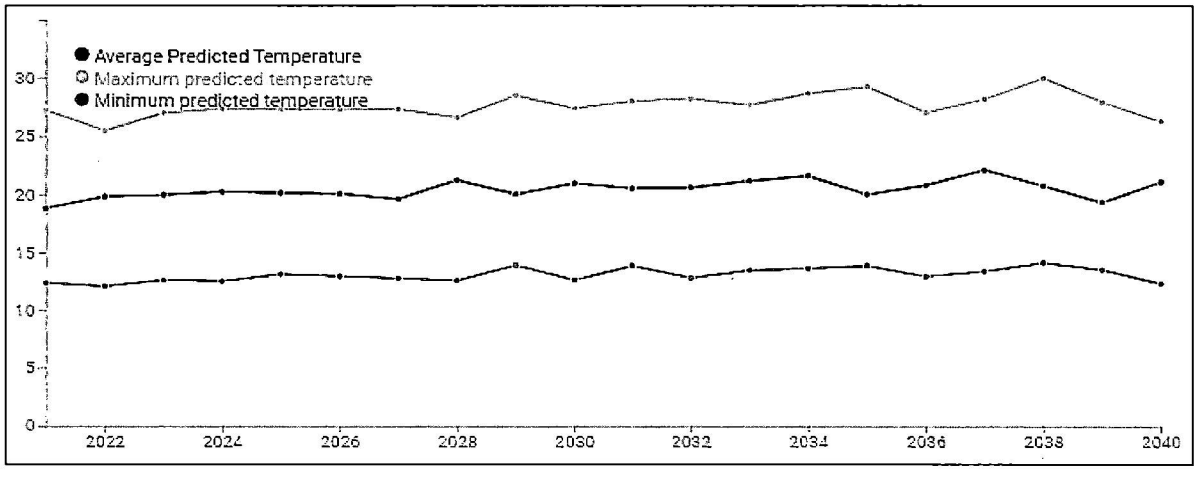
	MODERATE IMPACT
LOCATION	Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early.
EXTENT	Magnitude or intensity measured according to temperature in relation to the percentage of humidity and time. Excessive or extreme heat occurs when the heat index is expected to reach or exceed 105°-110° for at least 2 consecutive days, measured in shady locations.
HISTORICAL OCCURRENCE	No historical impact data is available for Brown County or individual participating jurisdictions; however, extreme heat is a common hazard throughout the region and state.

TABLE 6-1. *Heat Related Deaths, Texas Statewide*

YEAR	DEATHS	NOTES
2023	334	2ND Highest Summer Averages on Record
2022	306	
2021	203	
2010	160	Highest Summer Averages on Record

PROBABILITY	It is likely the participating jurisdictions will experience extreme heat in the next year.
VULNERABILITY / IMPACT	Significant threat to life and safety for the population including hyperthermia, heat cramps, heat exhaustion, and heat stroke; greatest risk to vulnerable populations (65 and older; under 5; low or fixed incomes with no air conditioning or inoperable air conditioning systems; outdoor workforce); stress to livestock and crops may result in decreased quality or production; asphalt and concrete road damages; vehicle engine and colling system mechanical failures; degraded wildlife habitat due to decreased water and air quality. Secondary impacts include drought, water shortages, increased fire danger, and energy grid strain leading to potential needs for rolling blackouts/brownouts. Impact to assets is limited with minimal potential for damage. Annualized losses are negligible based on historical records over a 25-year period due to temporary power outages from extreme heat. The National Risk Index[25] estimates Brown County's expected annual loss due to extreme heat to be relatively low and community resilience relatively moderate but social vulnerability to be relatively high. Impact to participating jurisdictions is considered moderate due the vulnerability for loss of human life and secondary hazards that may cascade from sustained extreme heat.

FIGURE 6-3. *Temperature Trends for Brown County (Celsius), Augurisk*



[25] https://hazards.fema.gov/nri/map

FIGURE 6-4. *Average Temperature, Brown County, 1895-2024, National Centers for Environmental Information*

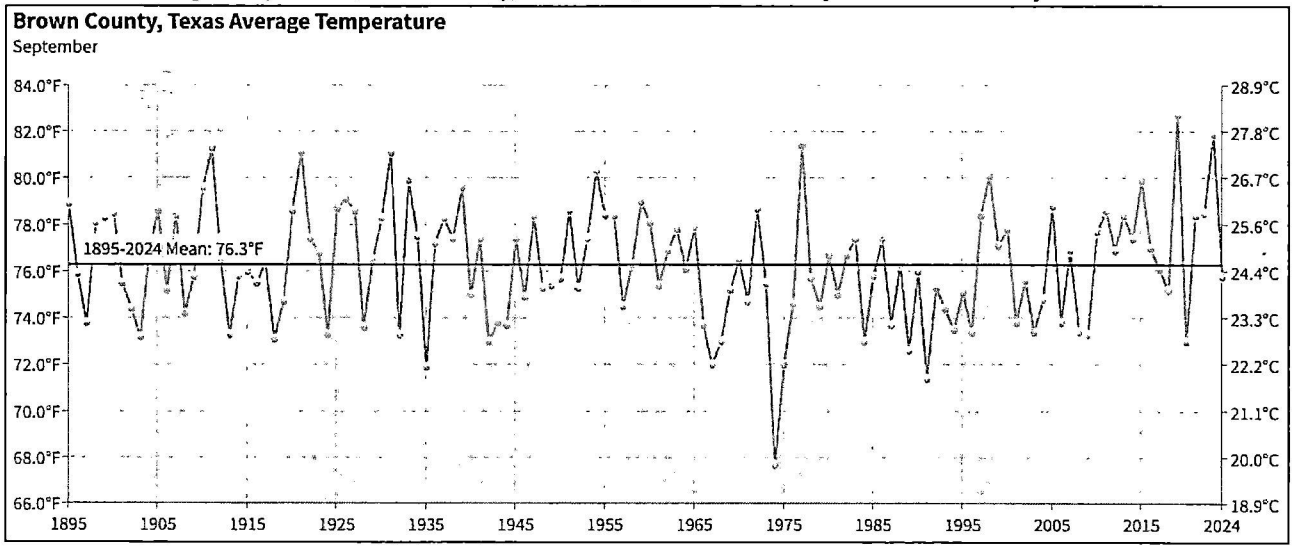
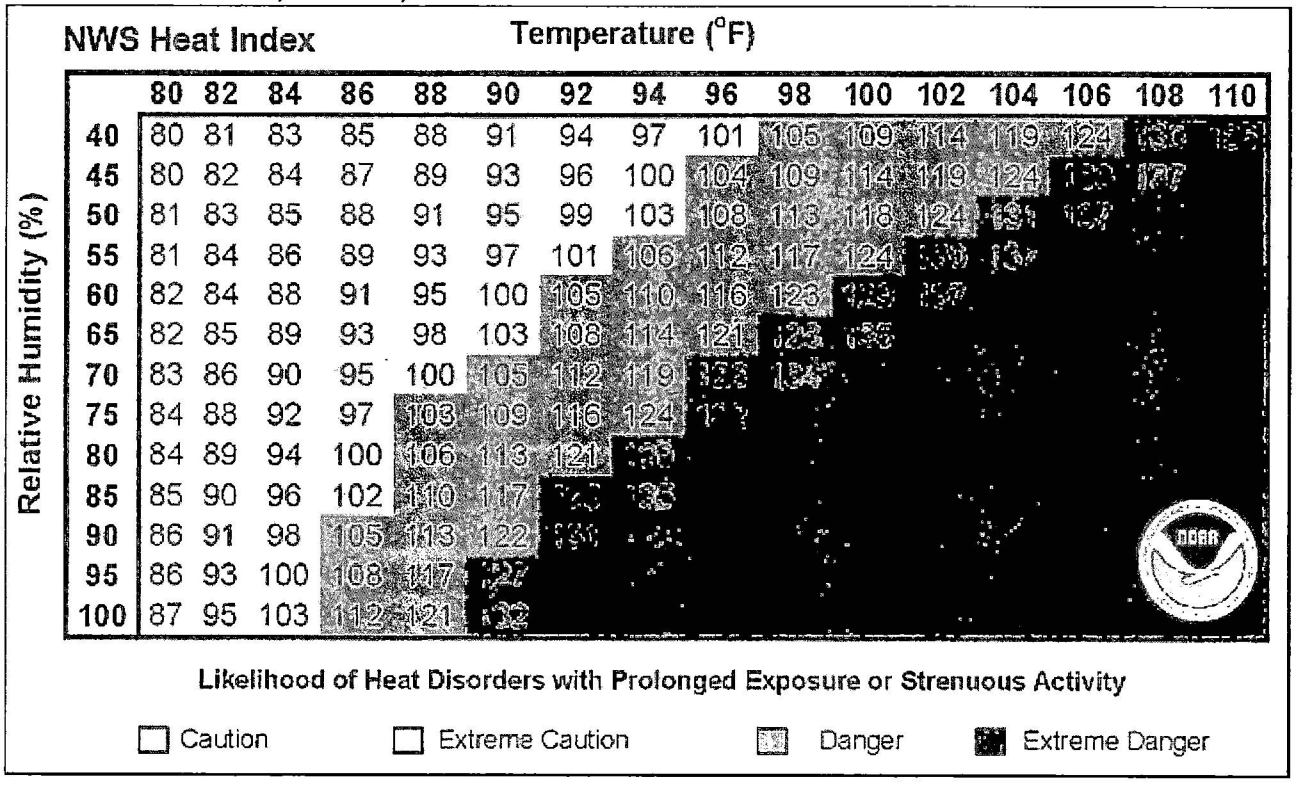


FIGURE 6-5. *Hazard Extent, Heat Index, NWS*[26]



[26] https://www.weather.gov/images/safety/heatindexchart-650.jpg

HAILSTORM

LIMITED IMPACT

LOCATION	Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early. Not confined to any specific geographic location; vary greatly in size, location, intensity, and duration.
EXTENT	National Weather Service (NWS) classifies hailstorm threat level based on hail diameter while the intensity and magnitude 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.
HISTORICAL OCCURRENCES	Historical data reflects previous occurrences of hailstorms ranging from H0 to H10. Between 2018 and 2023 zero injuries, fatalities, property damages, or crop damages were reported within Brown County out 52 documented hailstorm events.

TABLE 6-2. *Hailstorm Incidents, 1955-2017*

JURISDICTION	EVENTS	FATALITIES	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Brown County	258	0	1	$629,816	$430,155
Bangs	32	0	0	$13,380	$0
Blanket	16	0	0	$6,044	$0
Brownwood	64	0	1	$94,000	$35,000
Early	9	0	0	$0	$0

PROBABILITY	Hailstorm events are highly likely to occur in all participating jurisdictions within the next year. Hailstorms frequently involve H2-H6 intensities; however, an H10 hailstorm with significant structural damage and potentially fatal injuries can be anticipated to occur in the future.
VULNERABILITY / IMPACT	Vehicles, roofs, and landscaping are most damaged by hail. Utility systems on roofs at school districts and critical facilities would be vulnerable. Mobile and manufactured homes are present within each participating jurisdiction and are typically more vulnerable than site-built structures. Single family homes built prior to 1980 may be more susceptible to damages during significant hail events due to less stringent construction standards. Hail events can create dangerous situations, hazardous road conditions, downed trees, and power lines, and delay first responders or critical personnel. Hail can damage crops and injure livestock adversely affecting the economy. 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. The National Risk Index estimates Brown County's expected annual loss due to hail to be relatively low and community resilience relatively high but social vulnerability to be relatively high. Impact to participating jurisdictions is considered limited severity due to minimal concern for critical facility shutdown of more than 24 hours, historical losses, and damages less than 10% of property destroyed or with major damage.

TABLE 6-3. *TORRO Hailstorm Intensity and Magnitude Scale (H Scale)*[27]

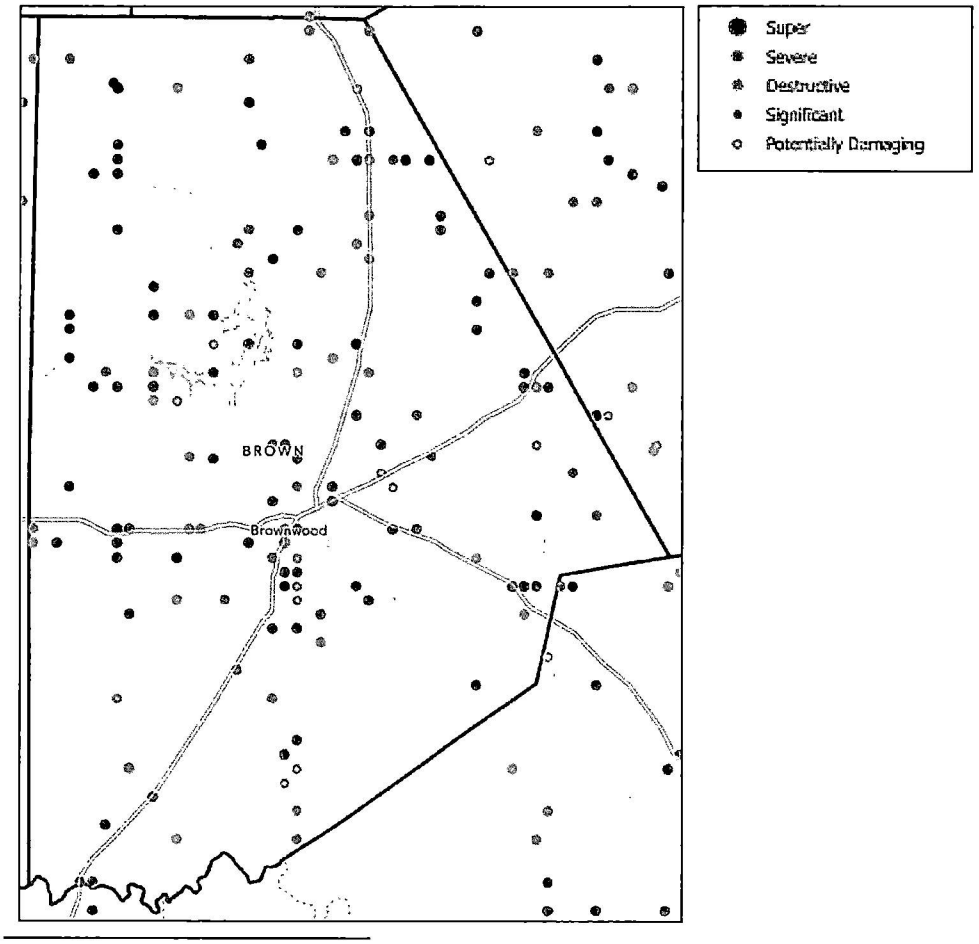
SCALE	INTENSITY	DIAMETER (mm)	TYPCAL DAMAGE IMPACTS
H0	Hard Hail	5	No damage
H1	Slight	5-15	Slight general damage to plants, crops
H2	Significant	10-20	Significant damage to fruit, crops, vegetation
H3	Severe	20-30	Severe damage to fruit, crops, glass, plastic structures, paint, wood
H4	Severe	25-40	Widespread glass damage, vehicle bodywork damage
H5	Destructive	30-50	Widespread damage to glass and tiled roofs, significant injuries
H6	Destructive	40-60	Bodywork of grounded aircraft dented; brick walls pitted
H7	Very Destructive	50-75	Severe roof damage, risk of serious injuries
H8	Very Destructive	60-90	Severe damage to aircraft bodywork
H9	Super Hailstorms	75-100	Extensive structural damage: risk of severe or fatal injuries
H10	Super Hailstorms	>100	Extensive structural damage: risk of severe or fatal injuries

[27] https://www.torro.org.uk/research/hail/hscale

TABLE 6-4. *Hail Threat Level, National Weather Service*

LEVEL	DESCRIPTION
	Extreme Threat to Life and Property from Severe Hail: Within 12 miles of a location, a moderate likelihood or greater (≥16% probability) of severe hail, with storms capable of baseball to softball sized stones AND/OR a high likelihood or greater (≥26% probability) of severe hail, with storms capable of golf ball to baseball sized hail stones AND/OR a very high likelihood (≥36%) of severe hail, with storms capable of quarter to golf ball sized hail stones.
HIGH (severe)	High Threat to Life and Property from Severe Hail: Within 12 miles of a location, a low likelihood (6-15% probability) of severe hail, with storms capable of baseball to softball sized stones AND/OR a moderate likelihood (16-25% probability) of very large hail (golf ball to baseball sized hail stones) AND/OR a high likelihood (26-35% probability) of large hail (quarter to golf ball sized hail stones).
MODERATE (destructive)	Moderate Threat to Life and Property from Severe Hail: Within 12 miles of a location, a very low likelihood (2-5% probability) of severe hail, with storms capable of baseball to softball sized stones AND/OR a low likelihood (6-15% probability) of severe hail, with storms capable of golf ball to baseball sized hail stones AND/OR a moderate likelihood (16-25% probability) of severe hail, with storms capable of quarter to golf ball sized hail stones.
LOW (significant)	Low Threat to Life and Property from Severe Hail: Within 12 miles of a location, a very low likelihood (2-5% probability) of severe hail, with storms capable of golf ball to baseball sized hail stones AND/OR a low likelihood (6-15% probability) of severe hail, with storms capable of quarter to golf ball sized hail stones.
VERY LOW (potentially damaging)	Very Low Threat to Life and Property from Severe Hail: Within 12 miles of a location, a very low likelihood (2-5% probability) of severe hail, with storms capable of nickel to golf ball sized hail stones AND/OR a low likelihood or greater (≥6%) of small hail (<1 inch).
NON-THREATENING	No Discernable Threat to Life and Property from Severe Hail: Within 12 miles of a location, environmental conditions do not support the occurrence of severe hail.

FIGURE 6-6. *Hailstorms 1955 - 2022*[28]



[28] https://www.arcgis.com/home/item.html?id=5972242f44714758b97c415a62a49ad5

SEVERE WIND

SUBSTANTIAL IMPACT

LOCATION

Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early. All participating jurisdictions are uniformly exposed to the threat of severe wind, common occurrence in all geographic locations within the county.

EXTENT

Extreme wind events caused by thunderstorms include straight line winds.

Higher pressures in one location of the atmosphere pushes air toward lower pressure areas creating wind (the distance between high- and low-pressure areas and the greater the difference in pressures, the stronger the force of wind). Straight line winds are responsible for most thunderstorm wind damages (a downburst of rapidly descending air beneath a thunderstorm, can cause damage equivalent to a strong tornado, derail trains, and make air travel extremely hazardous). The extent or magnitude of severe wind is measured by the Beaufort Wind Scale. Brown County can experience winds up to 200 mph and has experienced winds in the range of Beaufort Force 12 (74 mph and above). The worst extent in the future would be additional events of Beaufort Force 12.

TABLE 6-5. *Beaufort Wind Scale, NWS*

NUMBER	MPH	TERMINOLOGY	DESCRIPTION
0	0	Calm	Calm air, smoke rises vertically
1	1-3	Light Air	Wind motion visible in smoke
2	4-7	Light Breeze	Wind felt on exposed skin; leaves rustle
3	8-12	Gentle Breeze	Leaves and smaller twigs in constant motion
4	13-18	Moderate Breeze	Dust and loose paper are raised; small branches begin to move
5	19-24	Fresh Breeze	Smaller trees sway
6	25-31	Strong Breeze	Large branches in motion; whistling heard in overhead wires; umbrella use difficult
7	32-38	Near Gale	Whole trees in motion; some difficulty when walking into the wind
8	39-46	Gale	Twigs broken from trees; cars veer off road
9	47-54	Severe Gale	Light structure damage
10	55-63	Storm	Trees uprooted; considerable structural damage
11	64-73	Violent Storm	Widespread structural damage
12	74-95	Hurricane Force	Considerable and widespread damage to structures

HISTORICAL OCCURRENCES

Severe wind events associated with other hazards, such as tornadoes, have not been accounted for within this hazard. No property or crop damage has been reported with severe wind incidents (total of 9 events 2018 – 2023 across all participating jurisdictions) since the previous HMAP.

TABLE 6-6. *Severe Wind Events, 1955-2023*

JURISDICTION	EVENTS	FATALITIES	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
County	129	1	5	$5,887,879	$92,427
Bangs	9	0	0	$853,754	$0
Blanket	2	0	0	$67,024	$0
Brownwood	63	1	4	$2,546,550	$5,000
Early	7	0	0	$117,427	$0

On February 24, 2001, one man was fatally injured when an apparent downburst flipped his mobile home. One additional fatality occurred near Lake Brownwood due to significant debris.

PROBABILITY

Most thunderstorm winds occur during the months of March, April, May, and September. Based on available records of historic events, there have been 210 events in a 66-year reporting period, approximately 3 severe wind events annually. Even though the intensity of severe wind events is not always damaging for the participating jurisdictions, the frequency of occurrence is high, suggesting that an event is highly likely within the next year.

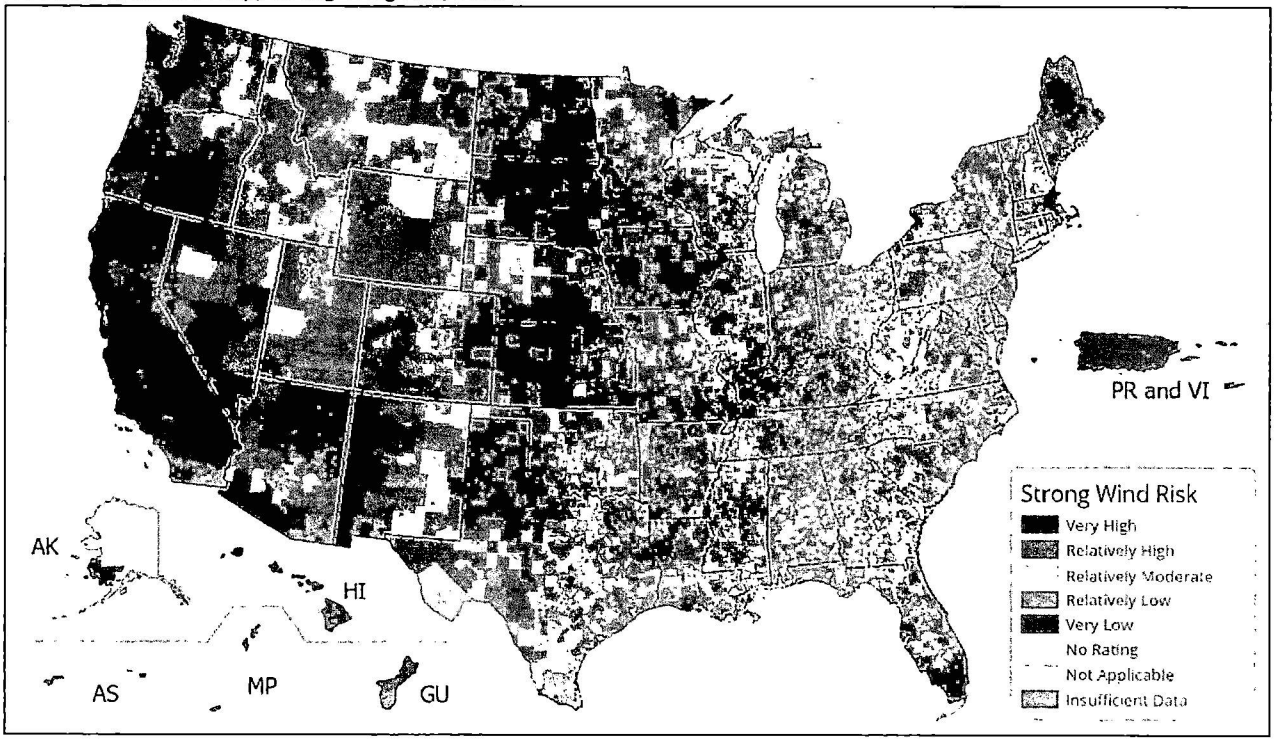
VULNERABILITY / IMPACT

Vulnerability is difficult to evaluate since severe 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 with the participating jurisdictions could potentially be impacted and remain vulnerable to possible injury and property loss. 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 severe wind events. More severe damage involves windborne debris; in some instances, patio furniture, other lawn items, and mobile homes 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 severe wind event.

In numerous instances roofs have been reported as having been torn off buildings. Portable buildings typically used at commercial properties and schools would be more vulnerable to severe wind events than typical site-built structures and could potentially pose a greater risk for wind-blown debris. The U.S. Census data indicates a total of 3,810 manufactured homes within Brown County. Approximately 2/3 of the single-family resident (SFR) structures in Brown County were built before 1980 and typically built to lower or less stringent construction standards than newer construction (may be more susceptible to damages during severe wind events).

Severe wind events can disrupt traffic leading to injuries, fatalities, and disruptions in government services including first responder capabilities and access. The impact of severe wind events in the participating jurisdictions is limited in structural damages, with less than 10% of properties damaged and critical facilities shutdown for 24 hours or less. However, there remains a moderate risk of fatalities and injuries. Additionally, the potential annualized losses for Brown County are expected to be above $100,000 county-wide for property and crop damages. Economic impacts are dependent on speed of repair and recovery activities.

FIGURE 6-7. *Hazard Map, Strong Wing Risk, FEMA*



TORNADO

MODERATE IMPACT

LOCATION

Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early. Not confined to any specific geographic location; vary greatly in size, location, intensity, and duration. All participating jurisdictions are uniformly at risk to tornadoes.

EXTENT

Capable of creating a path of tremendous destruction up to 1 mile wide and 50 miles long. Tornados are classified by the Enhanced Fujita (EF) Scale.

Weak tornadoes (69%) last 1-10 minutes with windspeeds less than 110 mph. Strong tornadoes (29%) may last 20 minutes or longer with winds of 110-205 mph and account for nearly 30% of all tornado deaths. Violent tornadoes (2%) may last more than 1 hour with winds greater than 205 mph and account for 70% of all tornado deaths. The expected tornado intensity within the participating jurisdictions is EF-1 based on historical data; however, planning should address all intensity levels (EF-0 to EF-5).

TABLE 6-7. *Beaufort Wind Scale, NWS*

RATING	EXPECTED DAMAGE	WIND SPEEDS (MPH)
EF-0	MINOR	65-85
EF-1	MODERATE	86-110
EF-2	CONSIDERABLE	111-135
EF-3	SEVERE	136-165
EF-4	DEVASTATING	166-200
EF-5	INCREDIBLE	Over 200

HISTORICAL OCCURRENCES

Only reported tornadoes were factored into the risk assessment. It is likely that a high number of occurrences have gone unreported, according to NOAA. A total of 21 tornado events have been recorded by the Storm Prediction Center at NOAA and NCEI databases for the county since 1950 with only 1 tornado event recorded in the last 10 years. Of those 21 tornado events recorded, 3 touched down within a participating jurisdiction other than the county (1 incident each since 1950: Bangs, Blanket, Early; 0 incidents each since 1950: Brownwood, Brookesmith ISD).

PROBABILITY

Based on recorded historical tornado events, the county can expect a tornado touchdown approximately every 3.5 years. However, the probability of a tornado event within Bangs, Blanket, Brookesmith ISD, Brownwood, and Early drops significantly.

VULNERABILITY / IMPACT

The National Risk Index estimates Brown County's expected annual loss due to tornadoes to be relatively low and community resilience relatively high but social vulnerability as relatively high. Tornadoes often cross jurisdictional boundaries. All existing and future buildings, facilities, and populations within the county are exposed to this hazard and could potentially be impacted. The damage caused by a tornado is typically a result of high wind velocity, wind-blown debris, lightning, and large hail. 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.

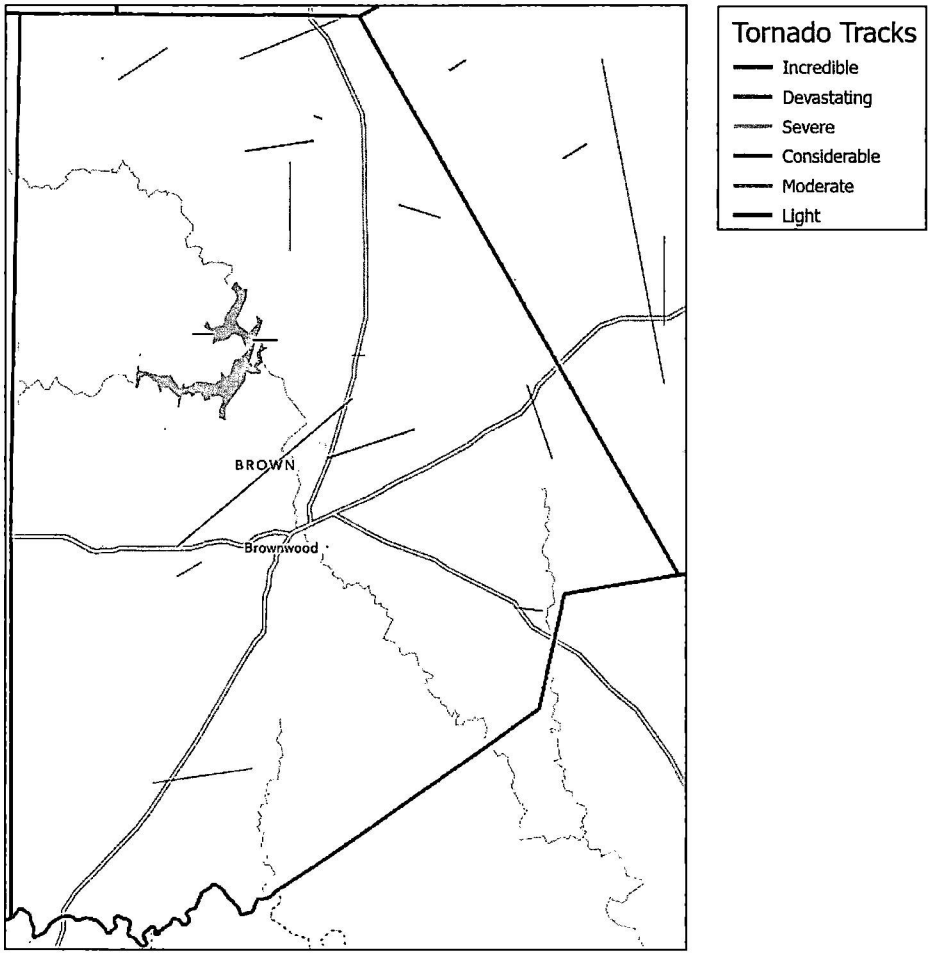
Brown County features multiple mobile or manufactured home parks, including all participating municipal jurisdictions (Brookesmith ISD features multiple manufactured buildings and classrooms). These areas are typically more vulnerable to tornado events than standard site-built structures. In addition, manufactured homes are located sporadically throughout the incorporated and unincorporated areas of the county which could also be more vulnerable. The U.S. Census data indicates a total of 3,810 manufactured homes within Brown County. Approximately 2/3 of the single-family resident (SFR) structures in Brown County were built before 1980 and typically built to lower or less stringent construction standards than newer construction (may be more susceptible to damages during significant tornado events).

Critical infrastructure would be vulnerable to tornado events in each participating jurisdiction. Based on historic loss and damages, the impact of tornadoes on Brown County and all participating jurisdictions can be considered limited, with less than 10% of property expected to be destroyed; however, the number of injuries and potential fatalities indicate a major impact, resulting in a moderate impact to the county.

TABLE 6-8. *Historical Tornado Events, 1950-2024*

JURISDICTION	DATE	TIME	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE ($)	CROP DAMAGE ($)
Brown County	1955-06-04	1630	F2	0	0	233,946	0
Brown County	1960-10-13	2030	F2	0	1	20,960,914	0
Brown County	1964-04-24	1410	F1	0	0	202,147	0
Brown County	1970-04-26	1657	F1	0	1	0	0
Brown County	1976-04-19	1730	F5	0	11	11,134,318	0
Brown County	1979-05-01	0500	F1	0	0	8,736	0
Brown County	1979-10-30	0615	F1	0	0	83,063	0
Brown County	1986-08-17	1600	F1	0	0	56,940	0
Early	1994-05-25	2030	F0	0	0	84,696	0
Brown County	1994-05-29	1845	F1	0	0	846,943	0
Brown County	1994-05-29	1943	F0	0	0	8,470	0
Brown County	1995-05-07	1830	F0	0	0	3,283	0
Brown County	1995-05-07	1900	F1	0	0	147,746	0
Brown County	1997-05-09	0130	F1	0	0	156,061	0
Brown County	2004-03-04	1236	F0	0	0	66,663	0
Brown County	2004-12-06	1443	F1	0	0	656,474	0
Brown County	2007-05-02	1448	F1	0	0	12,015	0
Bangs	2008-04-10	0035	F1 (2 EVENTS)	0	0	174,460	0
Blanket	2013-05-20	1641	F1	0	0	107,259	0
Brown County	2019-03-19	1419	F1	0	0	0	0

FIGURE 6-8. *Spatial Historical Tornado Events, 1950-2022*[29]



[29] https://www.arcgis.com/home/item.html?id=e75412d18bdc469dbf89bf7e929475cc

LIGHTNING

LIMITED IMPACT

LOCATION Not confined to any specific geographic location. All existing and future buildings, facilities, and populations with the participating jurisdictions are at risk from lightning. Prevalent across all participating jurisdictions (Brown County,). Risk scores vary based on geographical location (assessed by census tracts) for lightning across the participating jurisdictions.

FIGURE 6-9. *Lightning Risk, National Risk Index, Census Tracts*[30]

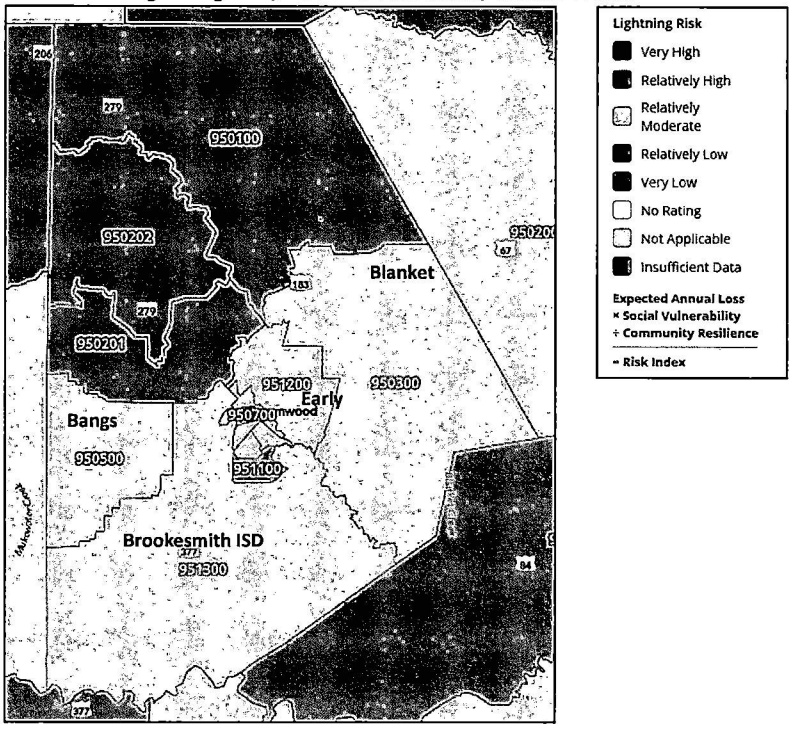
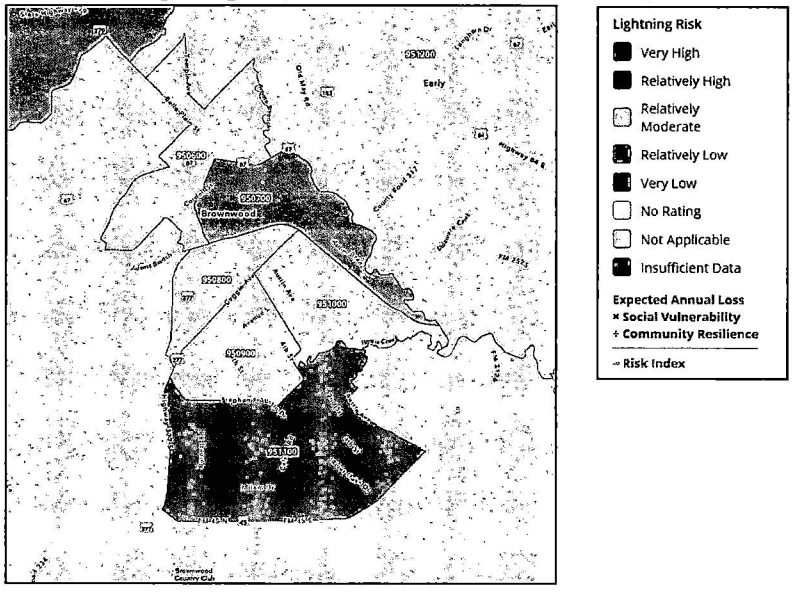


FIGURE 6-10. *Lightning Risk, National Risk Index, Census Tracts, Brownwood and Early*[31]



[30] https://hazards.fema.gov/nri/map

[31] https://hazards.fema.gov/nri/map#

EXTENT	Often, severe thunderstorms that involve hail, strong winds, and rain involve lightning (may occur as far as 10 miles away from precipitation). A bolt of lightning can reach temperatures approaching 50,000 degrees Fahrenheit. Lightning is a visible electrical discharge or spark of electricity in the atmosphere between clouds, the air and/or the ground often produced by a thunderstorm. The extent of lightning is measured by evaluating the annualized frequency and historic loss ratio. Annualized frequency is derived from either the number of recorded occurrences each year over a given period or the modeled probability of a hazard occurrence each year (annualized frequency = number of recorded events or event-days / period of record). For the purposes of this HMAP, the annualized frequency is based on recorded occurrences.
HISTORICAL OCCURRENCES	1,644 lightning events in Brown County over 22 years (74.7 events per year).
PROBABILITY	The probability of lightning within each participating jurisdiction is determined by annualized frequency. A higher annualized frequency value results in higher expected annual loss and risk index scores. Historical occurrences in all areas of Brown County, including Bangs, Blanket, Brookesmith ISD, and Brownwood) are statistically similar in events per year. Lightning risk ranges from relatively low to relatively high across the City of Brownwood. Unincorporated areas of Brown County range from relatively moderate to relatively high. Bangs, Blanket, Brookesmith ISD, and Early are rated as relatively moderate. The participating jurisdictions are highly likely to experience lightning within the next year; however, expected damages is likely to remain limited based on historic losses. One area of Brownwood[32], south of Stephen F. Austin Drive and Willis Creek has a relatively moderate risk of lightning, higher than all other areas of the county due to slightly higher annualized frequency (86.8 events per year) and expected annual losses ($11,114); however, the historic loss ratio remains relatively low for this geographical area.
VULNERABILITY / IMPACT	Vulnerabilities include infrastructure damage (electrical systems, communication networks, and buildings identified in HMAP), wildfires (secondary hazard especially in dry conditions), human safety (direct strikes or secondary effects can cause injuries or fatalities), economic disruption (damage to infrastructure and business can lead to financial losses), and educational impact (Ira ISD may face closures or disruptions due to lightning-related incidents). Impacts include power outages (electricity supply disruption affecting homes, businesses, schools, and local government operations), emergency response strain (local emergency services may be overwhelmed during severe lightning events), community displacement (severe impacts may lead to temporary relocation of residents), and environmental damage (lightning-induced fires can harm local ecosystems).

TABLE 6-9. *Lightning Categorization*[33]

TYPE	DESCRIPTION
Intracloud	This is the most common type, occurring within a single thunderstorm cloud between regions of opposite charge. It is often called sheet lightning because the flash illuminates the sky.
Cloud-to-Cloud	This occurs between two different clouds and can be part of a broader storm system.
Cloud-to-Ground	This is a discharge between a cloud and the ground, often referred to as a lightning strike.

† Positive vs. Negative Lightning
Lightning can be categorized by the polarity of the electrical discharge. Positive lightning involves a net transfer of positive charge from the cloud to the ground, while negative lightning involves a transfer of negative charge. Positive lightning is less common but more dangerous and can cause wildfires and damage to power lines.[34]

[32] https://hazards.fema.gov/nri/report/viewer?dataLOD=Census%20tracts&dataIDs=T48049951100
[33] https://www.weather.gov/safety/lightning-science-types-flashes#:~:text=There%20are%20two%20main%20types,cloud%20and%20on%20the%20ground.
[34] https://www.noaa.gov/jetstream/lightning/positive-and-negative-side-of-lightning

SEVERE WINTER STORM

SIGNIFICANT IMPACT

LOCATION	Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early. Not confined to any specific geographic location. All existing and future buildings, facilities, and populations with the participating jurisdictions are uniformly at risk to winter severe winter storms.
EXTENT	The extent or magnitude of a severe winter storm is measured in intensity based on the temperature and level of accumulations and wind chill factor (measure of how cold the wind makes real air temperature feel to the human body).
HISTORICAL OCCURRENCES	All jurisdictions within the county have been subject to winter storm watches, warnings, freezing rain, sleet, snow, and wind chill conditions on average 3-4 times per year. Historical data suggests that all participating jurisdictions can expect anywhere between 0.1 to 4.0 inches of ice and snow during a severe winter storm event and temperatures between 25 and 50 degrees with winds ranging from 0 to 20 mph. Six severe winter storm events have been recorded by the NCEI and NOAA since 2018 with no deaths or injuries and no property or crop damages reported. However, from 1996 to 2018, Brown County experienced property and crop losses of $51,976 with an annualized loss estimate of $2,363. However, on April 7, 2007, there was widespread sleet and snow (6 inches reported in Brown County, 4 inches reported in Brownwood) that caused dozens of traffic accidents, road closures, business disruptions, crop damage, and livestock deaths. In January 2021, widespread severe winter weather significantly disrupted power, government operations, business activities, education, and travel across the county, region, and state.
PROBABILITY	The probability of a future severe winter storm across all participating jurisdictions is highly likely with a winter storm likely to occur within the next year. THE NWS has improved the ability of public administrators to make time-sensitive decisions before and during severe winter weather. The probabilistic winter storm severity index (probWSSI) provides the likelihood of expected impacts that increase decision-making processes and provide additional time to plan. Deterministic forecasts will continue to be provided by NWS to decision-makers and the public.
VULNERABILITY / IMPACT	During periods of extreme cold and freezing temperatures, water pipes can freeze and crack, ice can build up on power lines, and tree limbs can fall on power lines resulting in utility service disruptions for extended periods of time. Increased heating fuel consumption leading to energy shortages and higher prices can impact the economy. House fires and subsequent casualties tend to occur more frequently from increased and improper use of alternate heating sources. Fires during severe winter storms present a greater danger due to frozen water supplies impeding response efforts. People and animals are subject to health risks from extended exposure to cold air and improper ventilation of portable generators. Vulnerable populations are at greater risk of death from hypothermia, especially in rural areas where populations are sparse and icy roads may impede travel. Nearly half of the 600 Americans that die from hypothermia annually are 65 years or older, per the U.S. Center for Disease Control and Prevention (CDC). Approximately 21% of the county population is 65 years or older. Hazardous travel conditions for the public may increase automobile accidents further straining emergency response capabilities. Travel conditions may delay or disrupt operations for first responders, utility response and recovery activities, and government operations; utility outages may occur resulting in secondary hazards or cascading events; property, crop, and livestock damages and losses may occur; and schools and business may close. The economic and financial impacts of severe winter storms on communities 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 contributes to the overall economic and financial conditions in the aftermath of a severe winter storm. The potential impact is considered significant due to the widespread geographic effects of severe winter storms and the likelihood of life and property loss.

TABLE 6-10. *Description of Severe Winter Storm Hazard, NWS*

TYPE	DESCRIPTION
SLEET	Small particles of ice typically mixed with rain; hazardous travel conditions if enough sleet accumulates on the ground.
BLIZZARD WARNING	Sustained wind speeds of ≥35 mph with considerable falling or blowing snow; dangerously restricted visibility.
FROST/ FREEZE WARNING	Below freezing temperatures expected; may cause significant damage to plants, crops, and fruit trees. Effective October 1st, 2024, the National Weather Service[35] revised the advisory terms associated with freeze to the following: • Hard Freeze Watches → Freeze Watch • Hard Freeze Warnings → Freeze Warning
WIND CHILL	Strong wind combined with temperatures slightly below freezing can have the same chilling effect as a temperature nearly 50°F; combined cooling power of the wind and temperature on exposed flesh is called the wind chill factor. Effective October 1st, 2024, the National Weather Service revised the advisory terms associated with wind chill to the following: • Wind Chill Watches → Extreme Cold Watch • Wind Chill Warnings → Extreme Cold Warning • Wind Chill Advisory → Cold Weather Advisory

TABLE 6-11. *Description of Severe Winter Storm Extent, NWS*

INTENSITY	TEMP (°F)	EXTENT DESCRIPTION
MILD	40 – 50	Winds < 10 mph; freezing rain or light snow falling in short durations; little or no accumulation.
MODERATE	30 – 40	Winds 10 – 15 mph; sleet and/or snow up to 4 inches.
SIGNIFICANT	25 – 30	Intense snow showers; strong gusty winds between 15 – 20 mph; significant accumulation.
EXTREME	20 – 25	Wind driven snow that reduces visibility; heavy winds between 20 – 30 mph; sleet or ice up to 5 mm in diameter.
SEVERE	Below 20	Winds ≥ 35 mph; snow and sleet >4 inches.

[35] https://www.weather.gov/news/243009-cold-hazard-simplification

DROUGHT

SIGNIFICANT IMPACT

LOCATION

Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early. Droughts occur regularly throughout the region and are a normal condition of the county; however, they vary greatly in intensity and duration. The majority of Brown County are currently experiencing severe drought conditions. No distinct geographic boundaries typically exist with drought; therefore, it can occur throughout all participating jurisdictions.

EXTENT

Drought is a period without substantial rainfall, or precipitation reduction, that persists from one year to the next. It is a normal part of virtually all climatic regions, including areas with high and low average rainfall. Drought can be classified as meteorological, hydrologic, agricultural, and socioeconomic.

TABLE 6-12. *Drought Classification*

TYPE	DESCRIPTION
METEOROLOGIC	Degree of dryness or departure of actual precipitation from an expected average or normal amount, bas on monthly, seasonal, or annual time scales.
HYDROLOGIC	Effects of precipitation shortfalls on stream flows and reservoir, lake, and groundwater levels.
AGRICULTURAL	Soil moisture deficiencies relative to water demands of plant life, such as crops.
SOCIOECONOMIC	Effect of demands for water exceeding the available supply because of a weather-related supply shortfall

TABLE 6-13. *Palmer Drought Index*

INDEX	DESCRIPTION	POSSIBLE IMPACTS
D0	Abnormally Dry	TOWARDS drought: short-term dryness slows planting, crop growth; fire risk above average. OUT OF drought: lingering water deficits; not fully recovered crops.
D1	Moderate	Some crop damage; high fire risk; streams, reservoirs, or wells low; some water shortages developing or imminent; voluntary water use restrictions requested.
D2	Severe	Crop losses likely; fire risk very high; water shortages common; water restrictions imposed.
D3	Extreme	Major crop/pasture losses; extreme fire danger; widespread water shortages or restrictions.
D4	Exceptional	Exceptional and widespread crop/pasture losses; exceptional fire risk; shortages of water in reservoirs, streams, and wells creating water emergencies.

The Palmer Drought Index is used to measure the extent of drought (measurement of 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. Hydrologic impacts of drought take longer to develop.

HISTORICAL OCCURRENCES

The participating jurisdictions typically experience severe drought (D2) conditions approximately 50% of the time with significant financial losses due to crop damage (15 events over 28 years).

PROBABILITY

Based on available records of historic drought events, there have been 15 extended periods of drought (ranging in length from approximately 30 days to over 300 days) within a 28-year period. Severe drought (D2) events are likely within the next year.

VULNERABILITY / IMPACT

Droughts can lead to secondary hazards, such as extreme heat, wildfires, and expansive soil. Extreme heat combined with drought is a dangerous situation because dying vegetation serves as a primary ignition source for wildfires. The impact of drought on wildlife and area farming is enormous often killing crops, grazing land, edible plants, and in severe cases, trees. Drought impacts are mostly experienced in water shortages and crop/livestock losses on agricultural lands and typically have no impact on buildings; however, all existing and future buildings, facilities, and populations are exposed to this hazard. Drought may also lead to potable water shortages and food shortages. Potable water is used for drinking, sanitation, patient care, sterilization, equipment, heating and cooling systems, and other essential functions of medical facilities. All residents within the county could be adversely affected by drought conditions, most notably vulnerable populations with inadequate cooling units in their homes.

Direct and indirect economic impacts of drought conditions with water shortages and crop/livestock losses can be significant, including goods production, services delivery, fish and wildlife habitat vulnerability, political and/or jurisdictional disputes over water rights/use, increased unemployment, and public health. Annualized loss estimates for Brown County are nearly $200,000.

FIGURE 6-11. *Palmer Drought Severity Index, Brown County, 2020 - 2024*[36]

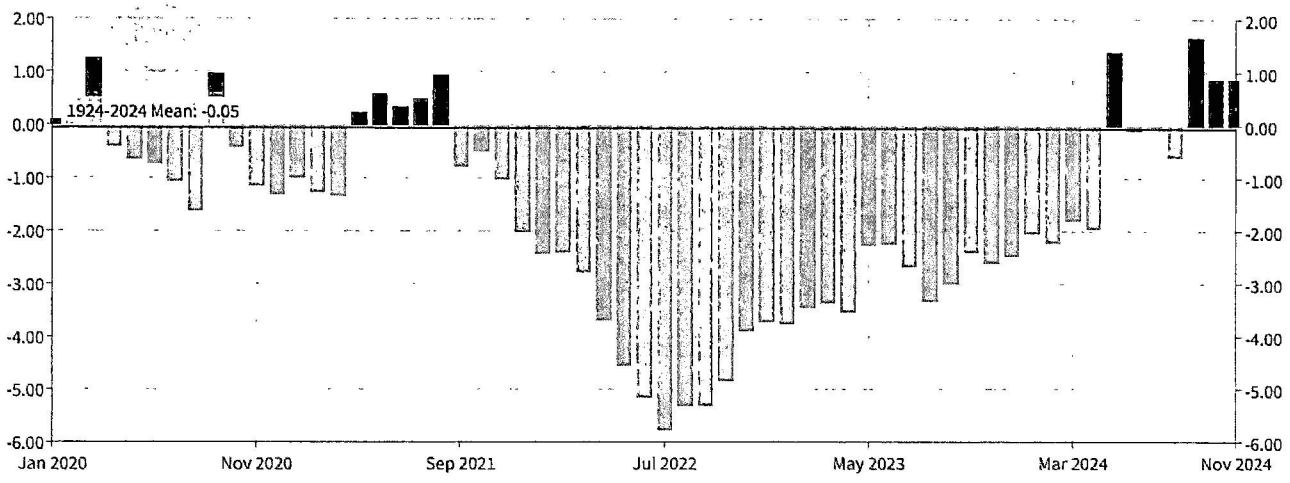
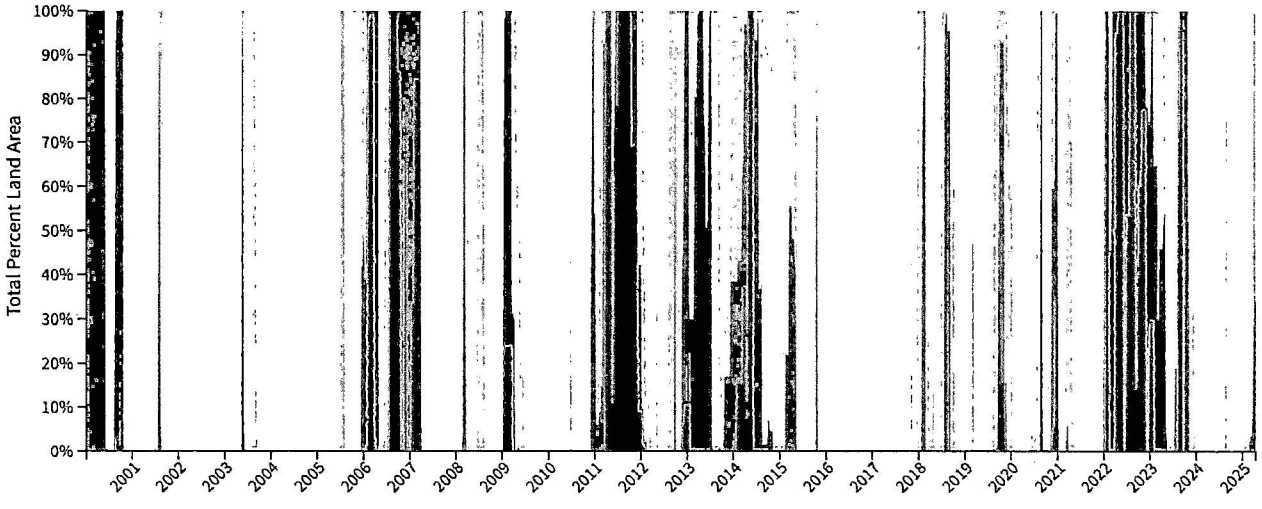


FIGURE 6-12. *U.S. Drought Monitor, Total Percent Land Area affected by Drought*[37]



[36] https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/county/time-series/TX-049/pdsi/1/0/2020-2024?base_prd=true&begbaseyear=1924&endbaseyear=2024

[37] https://www.drought.gov/states/texas/county/brown

FLOOD / STORMWATER RUNOFF

SIGNIFICANT IMPACT

LOCATION

Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early. Flood and stormwater runoff may occur throughout the geographical areas of all participating jurisdictions. The Flood Zone Map of Brown County and Flood Insurance Rate Maps (FIRM) of municipalities show hazard areas (areas subject to inundation by the 1% annual chance flood event) along waterways throughout the county and regulatory floodways.

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 damages 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 it will convey flood water. Flood zones are mapped on Flood Insurance Rate Maps, available through FEMA[38]. Zone A is commonly referred to as the 100-year flood (1% annual chance of flooding), Special Flood Hazard Area (SFHA), or the base flood, obtained from Texas Parks and Wildlife using arcGIS. These areas constitute a threat to participating jurisdictions with flood event impacts more damaging than non-base flood areas.

TABLE 6-14. *Flood Stage Classification*

FLOOD STAGE	DESCRIPTION
BELOW FLOOD	Water begins to exceed low sections of banks and the lowest sections of the floodplain.
ACTION	Flow is well into the floodplain; minor lowland flooding reaches low areas of the floodplain; livestock should be moved from low lying areas.
MINOR FLOOD	Minor flooding is expected with water surface slightly above the flood stage measurements; few, if any, buildings are expected to be inundated; roads may be covered with water; parklands and lawns may be inundated; water may go under elevated buildings.
MODERATE FLOOD	Inundation of buildings begins; roads likely to be dangerous or closed; areas/communities cut off; some evacuations may be necessary.
MAJOR FLOOD	Significant to catastrophic, life-threatening flooding may be expected; extensive flooding with some low-lying areas completely inundated likely; structures may be completely submerged; large-scale evacuations may be necessary.
RECORD	Rivers and lakes are at its highest recorded levels at gauge locations (does not necessarily imply a major flood - some areas may have never experienced major flooding and thus record stage is in the moderate category).

Typically, flood events place the participating jurisdictions at the extent of Below Flood Stage; however, the county has experienced Minor and Moderate Flood Stages. The highest extent the participating jurisdictions can anticipate in the future is Major Flood Stage and all participating jurisdictions could expect to experience up to 6 inches of rainfall within a 9-hour period, resulting in stormwater runoff flash flooding. Flood depths can range from shallow inundation in some areas to several feet in move vulnerable locations (indicated on flood zone and FIRM maps). Specific data on potential depths is unavailable based on current mapping (data deficiency).

HISTORICAL OCCURRENCES

ACTION STAGE (1931) Pecan Bayou at Brownwood reached an overflow elevation of 16.92 feet.
FLOOD STAGE (2016) Pecan Bayou near Cross Cut reached an overflow of 27.22 feet.
FLASH FLOODING (1997) Streams rose rapidly and overflowed in heavy rains; a motorist drowned while attempting to cross low water crossing on County Road 411 near Hogg Creek; Lake Brownwood rose nearly 3 feet above its spillway leaving over 90 residents stranded; road closures required throughout Brownwood.
FLASH FLOODING (2000) Approximately 10 inches of rainfall inundated Brownwood; all creeks and streams overflowed; several housing areas severely impacted; at least 125 people forced to evacuate; estimated 160 homes and business damaged.
Additional historical occurrences that resulted in reported casualties and/or damages are listed below. A total of 55 flood events (including stormwater runoff and flash flooding) occurred between 1996 and 2023.

[38] https://msc.fema.gov/portal/search?AddressQuery=brown%20county%2C%20texas

PROBABILITY	Flooding in all participating jurisdictions is likely **to** occur within the next year.
VULNERABILITY / IMPACT	Flooding poses a potential for catastrophic damage. Structures built in flood zones 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 elevations, may also be damaged. Health risks and threats to residents are elevated due to contaminated flood waters (untreated sewage and hazardous chemicals) and mold growth typical in flooded homes and buildings. Extended power outages are possible, increasing impacts to vulnerable populations. Evacuations, shelter, or relocation of residents during and after flood events are possible. Unsafe conditions due to downed power lines, contaminated or unstable debris, and hazardous materials impact emergency response and recovery activities, government operations, and economic conditions. Damage to infrastructure may slow economic recovery with extensive and lengthy repairs. Extensive or repetitive flooding can lead to decreased property values in affected communities. Flood poses a potential for catastrophic damages to annual and perennial crop production and quality. The range of flood intensity that participating jurisdictions can experience is high (Zone A). No known critical facilities are located within the floodplain. Typical property damage impact for flood and stormwater runoff is limited as facilities and services would be shut down for <24 hours and <10% of structures would be destroyed or suffer major damage. However, with 3 deaths, $72,521,547 in property losses, and $ 101,251 in crop losses reported since 1996, the impact of flooding and stormwater runoff to Brown County and Brownwood is substantial (limited impact to Bangs, Blanket, Brookesmith ISD, and Early). Floodwalls, floodgates, levees, and evacuation routes are effective flood mitigation measures.

TABLE 6-15. *Significant Historical Flood Events, 1996 – 2023, with Reported Deaths, Injuries, or Damages*

JURISDICTION	DATE	TIME	DEATHS	INJURIES	PROPERTY DAMAGE ($)	CROP DAMAGE ($)
BROWN COUNTY	1996-09-15	0050	0	0	39,584	0
BROWN COUNTY	1997-06-06	0530	0	0	77,933	0
BROWN COUNTY	1997-06-10	0400	0	0	77,933	15,587
BROWN COUNTY	1997-06-22	2230	1	0	389,666	77.933
BROWN COUNTY	1997-10-08	1905	0	0	12,369	7,731
BROWN COUNTY	1998-07-04	1140	0	0	7,655	0
BROWN COUNTY	2000-06-15	0255	0	0	10,869,523	0
BROWN COUNTY	2000-10-29	0520	0	0	7,180	0
BROWN COUNTY	2002-07-03	0315	0	0	11,098	0
BROWN COUNTY	2002-07-04	0200	0	0	6,937	0
BROWN COUNTY	2002-07-06	0140	0	0	58,266,919	0
BROWN COUNTY	2003-06-11	2100	0	0	13,601	0
BROWN COUNTY	2003-09-14	0430	0	0	13,491	0
BROWN COUNTY	2007-05-01	0230	0	0	42,053	0
BROWN COUNTY	2007-06-17	0505	0	0	11,992	0
BROWN COUNTY	2015-07-08	1200	1	0	0	0
BROWN COUNTY	2018-10-17	1016	0	0	2,400,000	0
BROWN COUNTY	2019-05-12	1230	1	0	5,000	0

FIGURE 6-13. *Flood Events 1996 – 2016, FEMA*

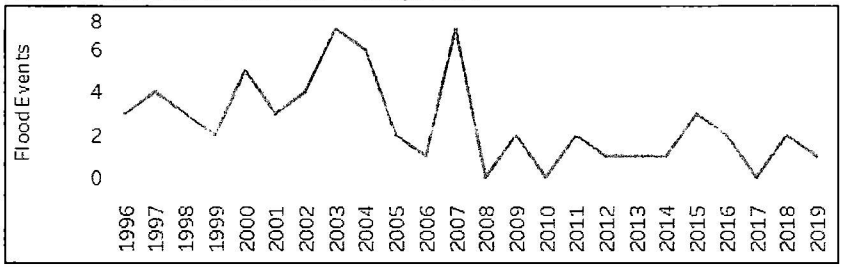
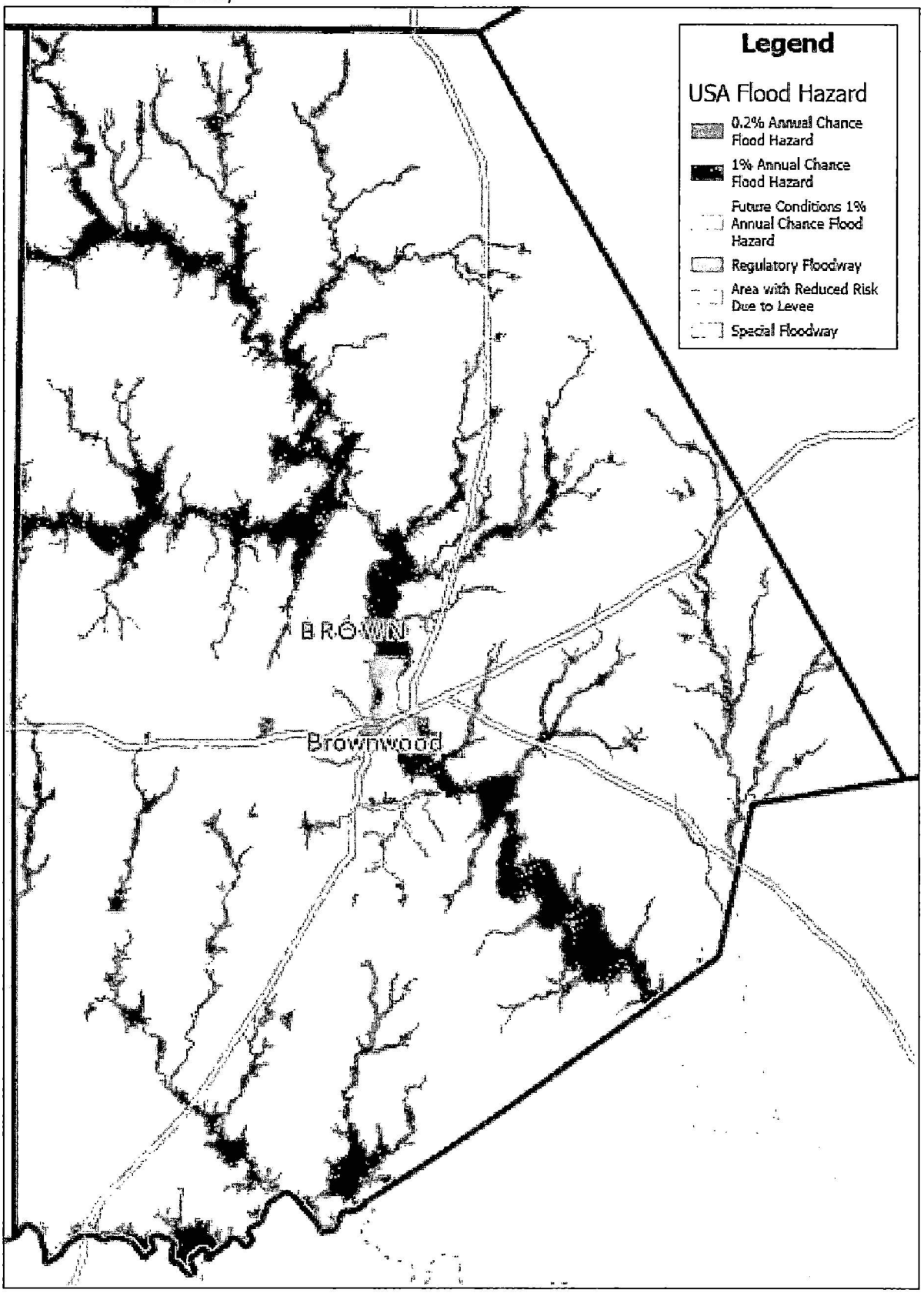
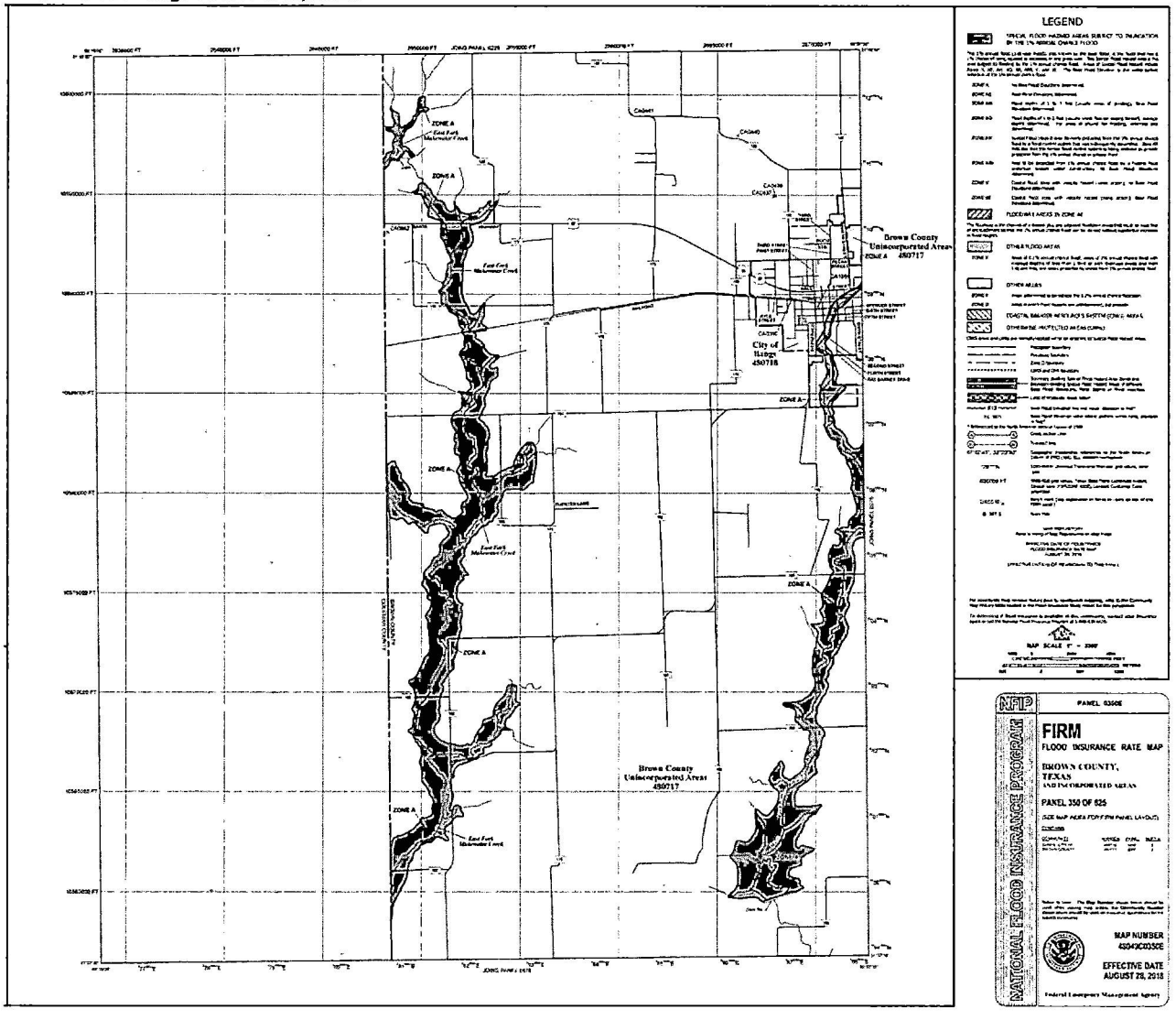


FIGURE 6-14. *Flood Zone Map*[39]



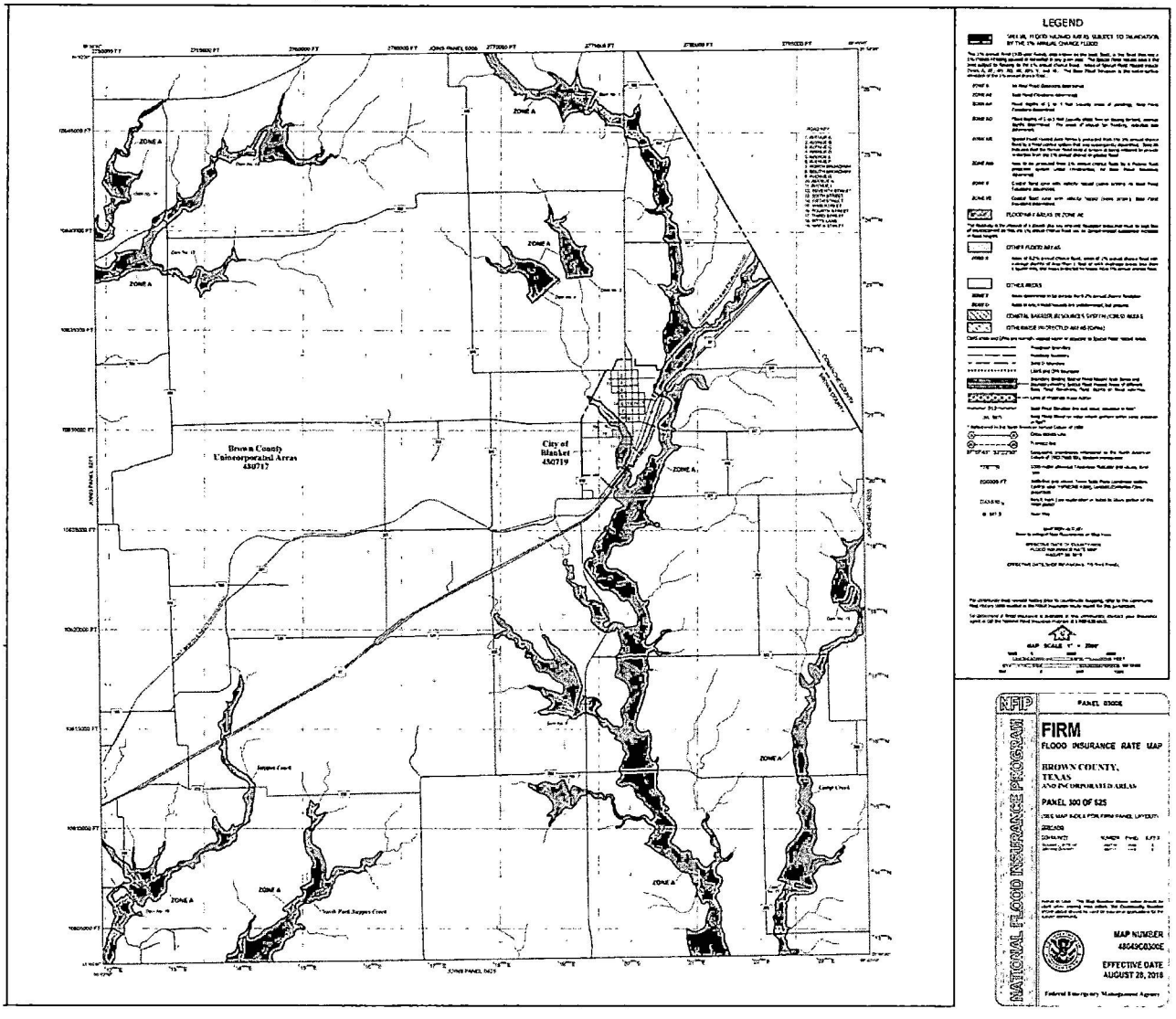
[39] https://www.arcgis.com/home/item.html?id=11955f1b47ec41a3af86650824e0c634

FIGURE 6-15. *Bangs FIRM Panel, 2018*[40]



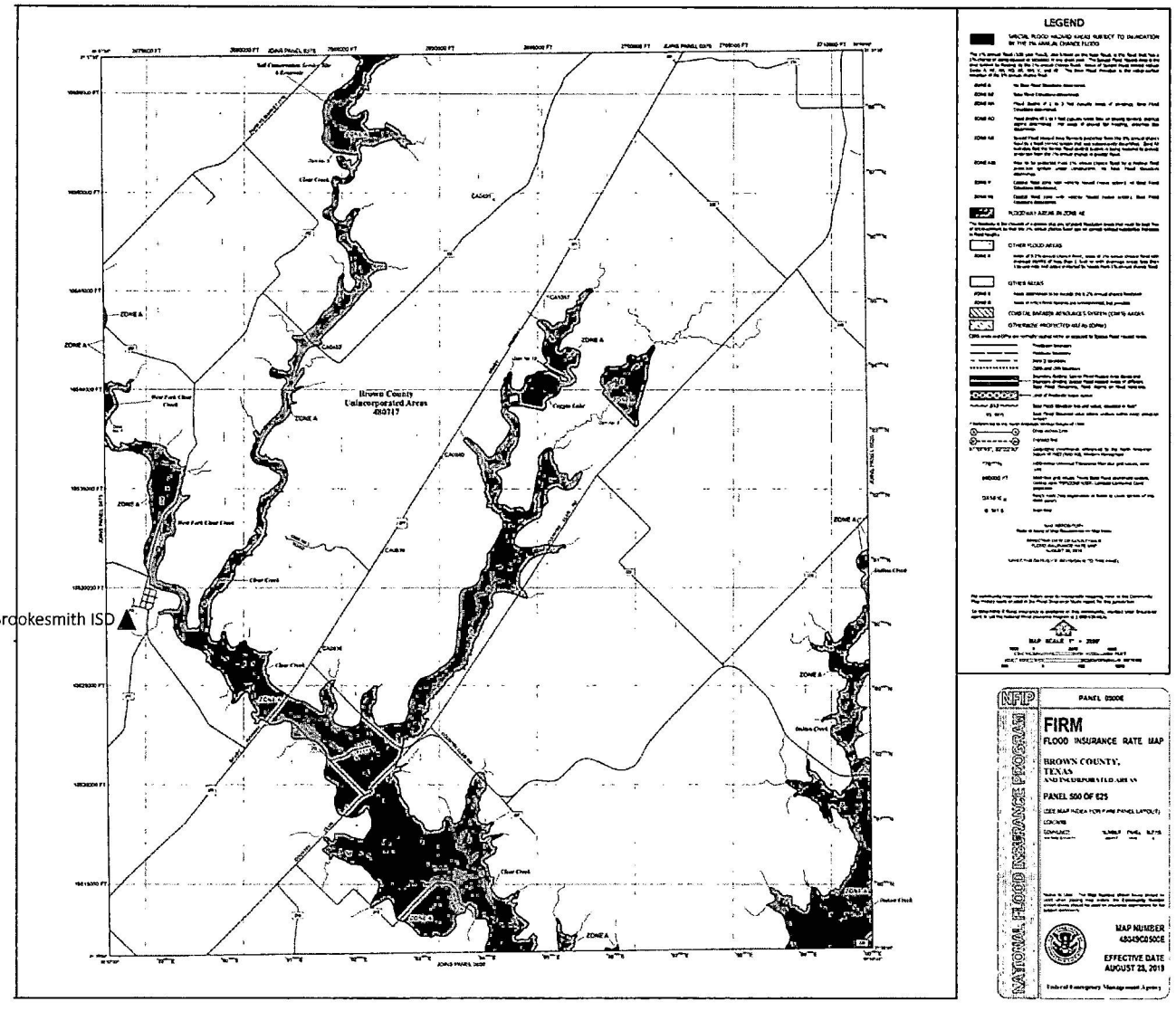
[40] https://msc.fema.gov/portal/search?AddressQuery

FIGURE 6-16. *Blanket FIRM Panel, 2018*[41]



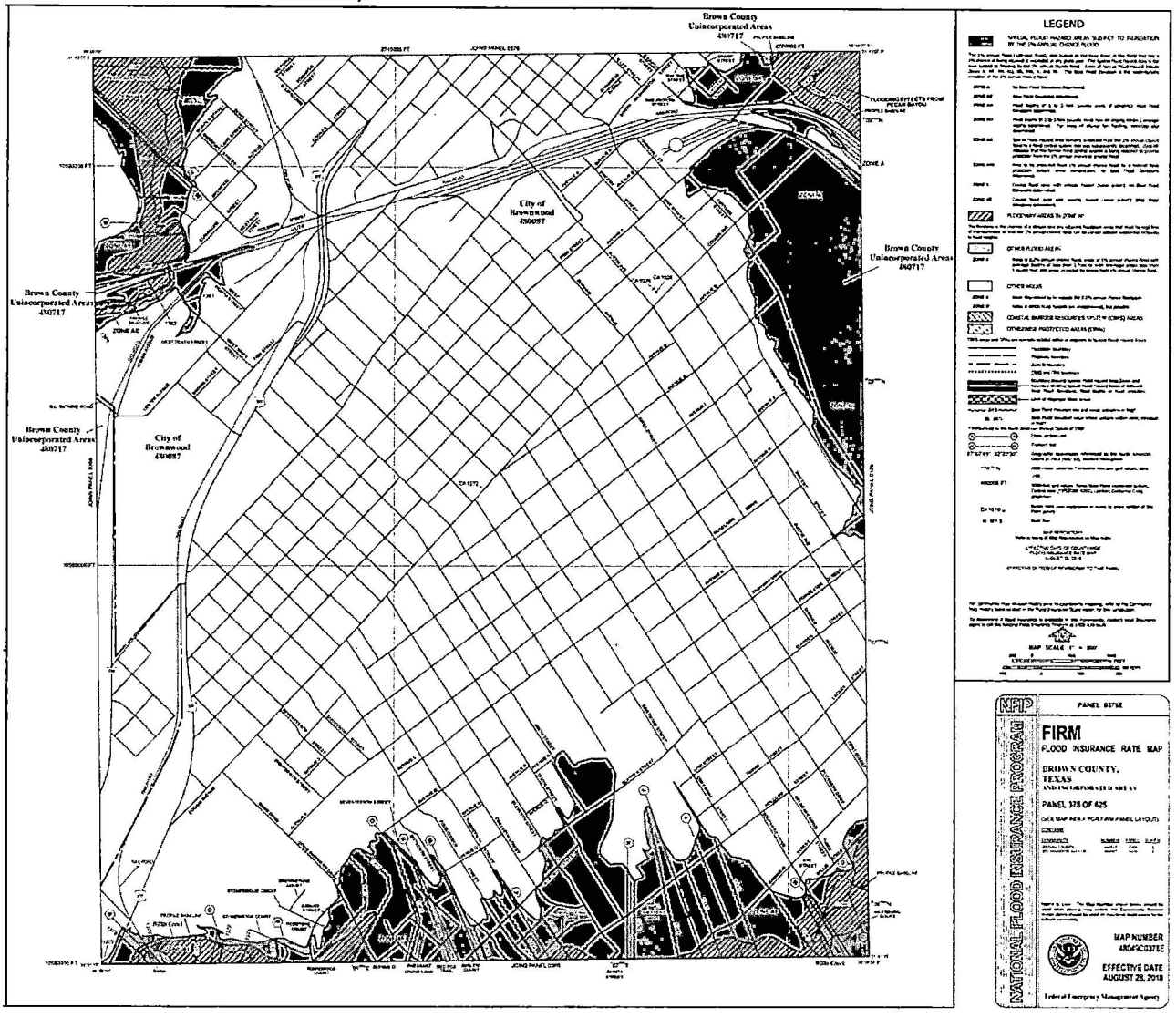
[41] https://msc.fema.gov/portal/search?AddressQuery

FIGURE 6-17. *Brookesmith FIRM Panel, 2018*[42]



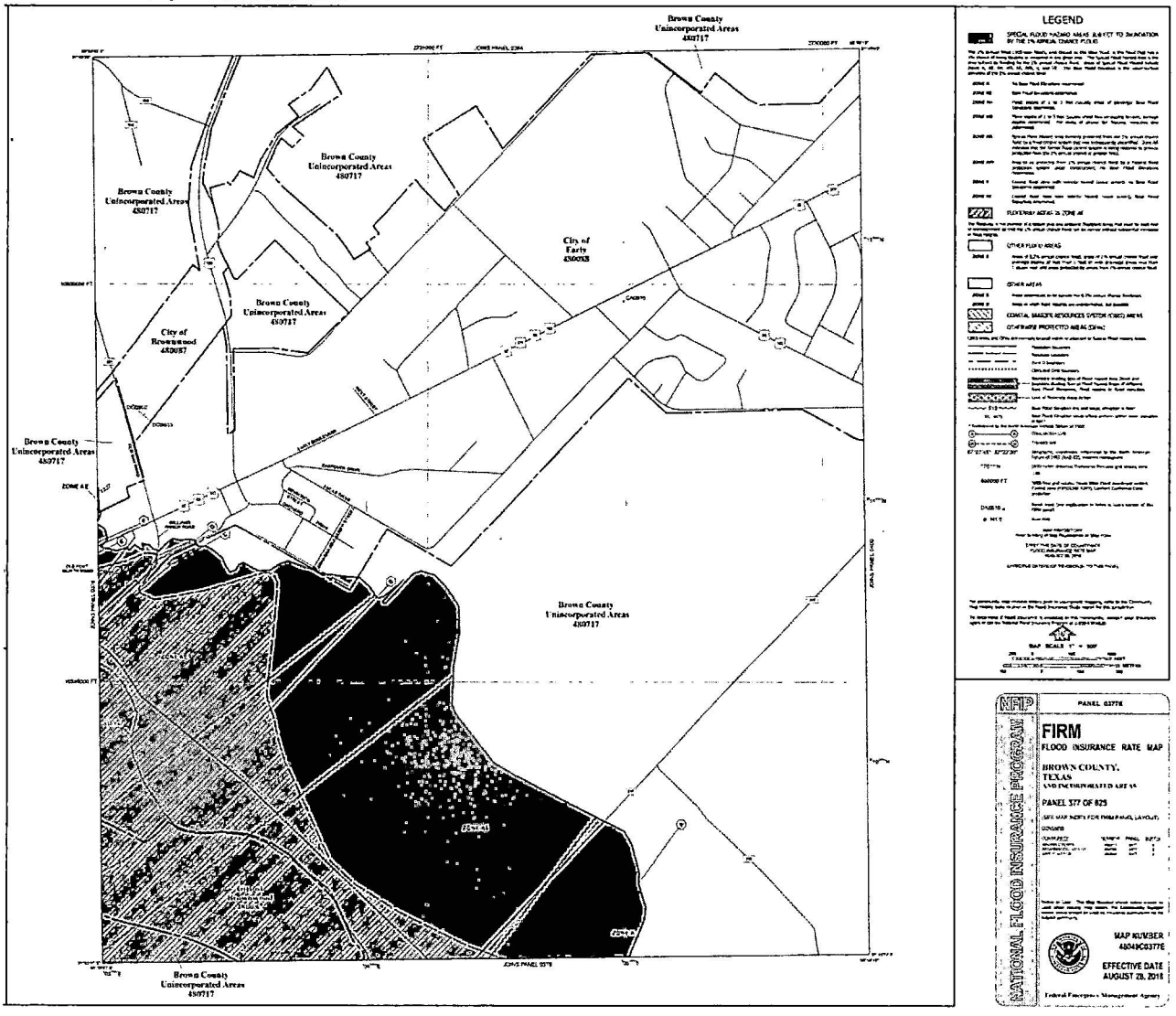
[42] https://msc.fema.gov/portal/search?AddressQuery

FIGURE 6-18. *Brownwood FIRM Panel, 2018*[43]



[43] https://msc.fema.gov/portal/search?AddressQuery

FIGURE 6-19. *Early FIRM Panel, 2018*[44]



[44] https://msc.fema.gov/portal/search?AddressQuery

EARTHQUAKE

MINIMAL IMPACT

LOCATION

Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early. Earthquake locations are described by the focal depth (depth of hypocenter from the Earth's surface) and geographic position of the epicenter (Earth's surface directly above hypocenter).

EXTENT

Earthquakes commonly occur without warning and impacts large areas radiating from the epicenter. The USGS defines an earthquake hazard as anything associated with an earthquake that may influence normal activities. The magnitude, or intensity, of an earthquake is a recorded value of the amplitude of seismic waves. The Richter Scale is the most used scale to measure the strength of an earthquake (no upper limits, does not describe damage). Each level is ten times stronger than the previous level.

TABLE 6-16. *Earthquake Magnitude Classification*

MAGNITUDE	DESCRIPTION
0 – 1.9	Detected only by seismograph, humans cannot feel this magnitude.
2 – 2.9	Hanging objects may swing, humans may feel this magnitude.
3 – 3.9	Comparable to vibrations of a passing truck, humans near epicenter will feel this magnitude.
4 – 4.9	May break windows, cause small or unstable objects to fall.
5 – 5.9	Furniture moves, chunks of plaster may fall from walls.
6 – 6.9	Damage to well-built structures, severe damage to poorly built structures.
[redacted]	Buildings displaced from foundations, cracks visible in the earth, underground pipes broken.
[redacted]	Bridges destroyed; few structures left standing.
[redacted]	Near-total destruction, waves moving through the earth visible with naked eye.

HISTORICAL OCCURRENCES

The USGS has no documented incidents of earthquake epicenters located within the participating jurisdictions, no damage has resulted from epicenters located across the region, and no earthquakes have been felt by humans. There are no significant earthquakes on record in the State of Texas. The National Geophysical Data Center defines significant earthquakes as an event that caused moderate damage of $1 million or more, resulted in 10 or more deaths, registered as a magnitude 7.5 or greater, has a registered Modified Mercalli Intensity Scale of 10 or greater, or generated a tsunami. None of this criterion has been met within the county.

PROBABILITY

The USGS assesses earthquake hazard probability[45]. For seismic risk analysis, the most used probability of exceedance is 10%, and the most used time is 50 years. Statistically, the loss which has a 10% probability of exceedance in 50 years also has approximately 0.2% probability of exceedance in 1 year, and an effective return period of 475 years. Brown County has an extremely low risk of peak ground acceleration (PGA), according to the USGS. The probability of an earthquake significantly affecting the participating jurisdictions is unlikely.

VULNERABILITY / IMPACT

Taking into consideration the possible extent of an earthquake for the county and surrounding area, by reviewing the Richter Scale and Modified Mercalli Intensity in conjunction with previous occurrences, the participating jurisdictions can anticipate future events to be less than 2.5 Richter Scale with light shaking and no potential damage. With no historical record of an earthquake event in Brown County, annualized loss estimates are not available, and the potential severity of impact is limited.

[45] https://earthquake.usgs.gov/hazards/interactive/

FIGURE 6-20. *Earthquake Hazard Risk, PGA, 10% in 50 Years, USGS*

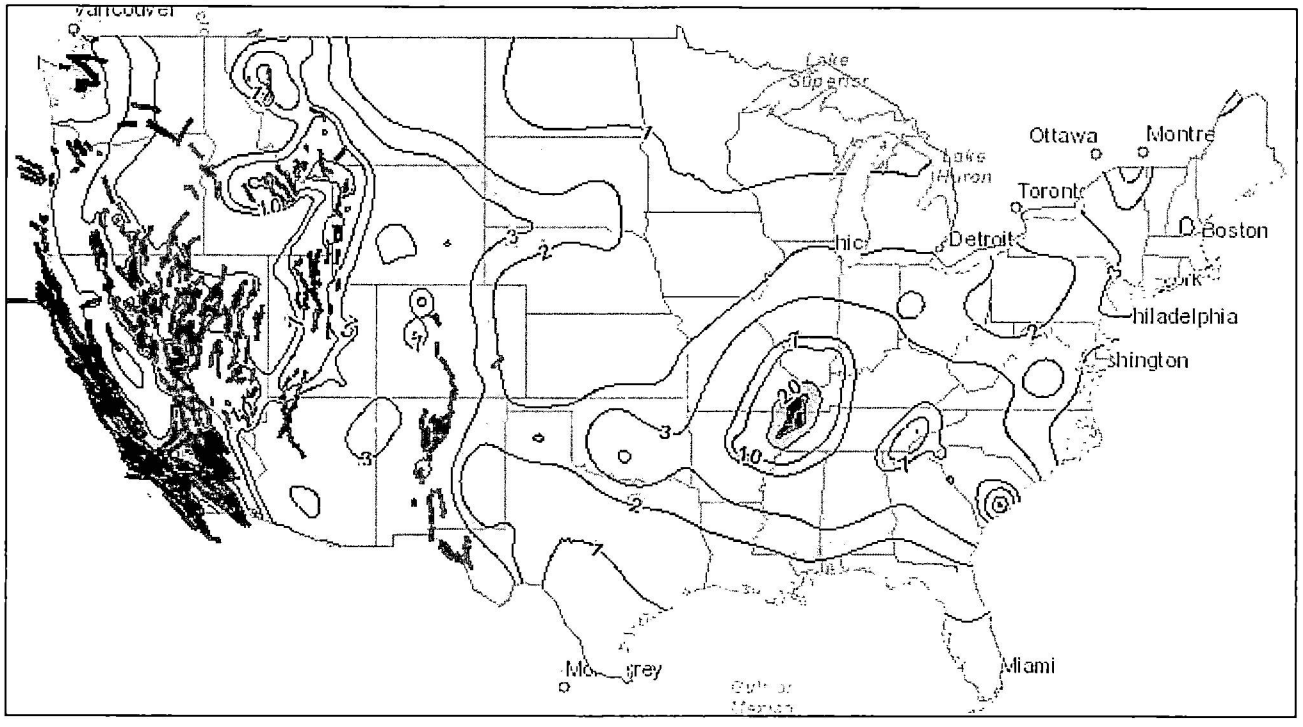
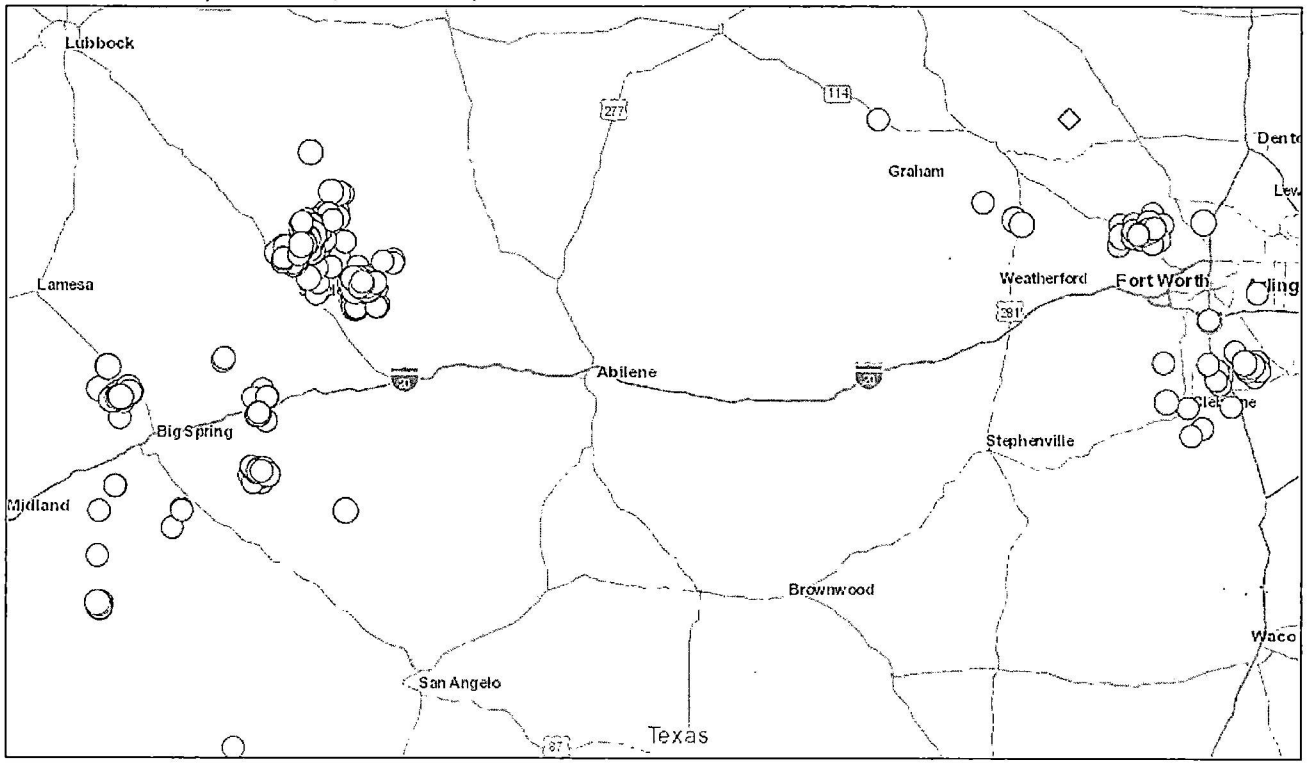


FIGURE 6-21. *Earthquake Events, 2004 – 2024, USGA*



EXPANSIVE SOIL

LIMITED IMPACT

LOCATION

Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early. All participating jurisdictions may be affected by some degree of expansive soils and soil erosion.

EXTENT

Expansive soils are soils and soft rocks with a relatively high percentage of clay minerals subject to changes in volume as they swell and shrink with changing moisture conditions. Drought conditions can cause soils to contract in response to a loss of soil moisture. Expansions in soil of 10% or more are common in Brown County. Changes in soil volume and expansion can exert enough force on a building or structure to cause damage. Reductions in soil volume can affect structural support resulting in damage.

Fissures in soil can also develop and facilitate deep penetration of water when moist conditions or runoff occurs, producing a cycle of shrinkage and swelling that place repetitive loss stress on structures. Soil erosion consistently occurs during and after flood conditions, increasing agricultural losses. The participating jurisdictions are affected by slight to moderate expansive soils within the North Central Prairie, Western Cross Timbers, and Grand Prairie. Soil surveys are used to select sites for roads, structures, and infrastructure.

TABLE 6-17. *Soil Descriptions by Region*

AREA	DESCRIPTION
NORTH CENTRAL PRAIRIE	Predominantly grassland intermixed with small wooded areas; undulating landscape (slow to rapid surface drainage); upland soils mostly deep, well-drained, brown or reddish-brown, slightly acid loams over neutral to alkaline, clay subsoils; shallow or moderately deep to shale soils; bottomland soils mostly well-drained, dark-brown or gray loams and clays; rangeland, wheat, grain sorghums, etc.; brush control, wind and water erosion, and limited soil moisture are major management concerns.
WESTERN CROSS TIMBERS	Undulating landscape dissected by many drainage-ways; surface drainage rapid; upland soils mostly deep, grayish-brown, reddish-brown, slightly acid loams with loamy/clay subsoils; bottomland soils along major rivers deep, reddish-brown, neutral to alkaline silt loams/clays; grazing beef and dairy cattle on native range/ improved pastures; peanuts, grain sorghums, small grains, peaches, pecans, and vegetables; major soil management problem on grazing lands is brush control, waste management on dairy farms, and wind/water erosion on cropland.
GRAND PRAIRIE	Undulating to hilly landscape dissected by many streams; surface drainage rapid; upland soils mostly dark-gray, alkaline clays; some upland soils shallow over limestone, stony, or light-colored loamy soils over chalky limestone; riverbed bottomland soils reddish silt loams/clays; non-riverbed bottomlands dark-gray loams/clays; rangeland, pastureland, and cropland; beef cattle; some small grain, grain sorghums, corn, and hay; brush control and water erosion are major management concerns.

HISTORICAL OCCURRENCES

Participating jurisdictions are subject to a range of plasticity index levels ranging from low to very high. Plasticity index levels are subject to location and soil moisture content in any given time frame. Soil erosion and expansive soil cannot be documented as a time-specific event unless it leads to structural damage. Limited historical data is available; however, conditions are typically associated with droughts.

PROBABILITY

Participating jurisdictions may anticipate very high expansive soil conditions in the future; however, no specific occurrences have been identified meaning the probability of future occurrences based on statistical data cannot be determined at this time. Public opinion and planning team input during the risk assessment concluded that the probability of future events of loss is likely, especially during periods of increased drought.

VULNERABILITY / IMPACT

Agriculture and livestock losses cracked foundations and floors; cracked roads; and ruptured pipelines commonly occur from swelling soils. Older and slab on grade structures are more likely to suffer damages. Cosmetic to substantial foundation and structural damages may be significant. Infrastructure damage to pipelines, including sewer and water lines, may increase maintenance/ repair/replacement costs. Homeowners and public agencies without funding to cover preventative measures often incur the largest percentage of damage repair costs. The most extensive damage from expansive soils occurs to bridges, highways, streets, and parking lots, especially when constructed during droughts that lead to excessive swelling following rain. No injuries, fatalities, facility shutdowns greater than 24 hours, or damage to more than 10% of structures has occurred resulting in an expectation of limited impact in the future.

FIGURE 6-22. *Land Resource Areas, Natural Resources Conservation Service of the U.S. Department of Agriculture*

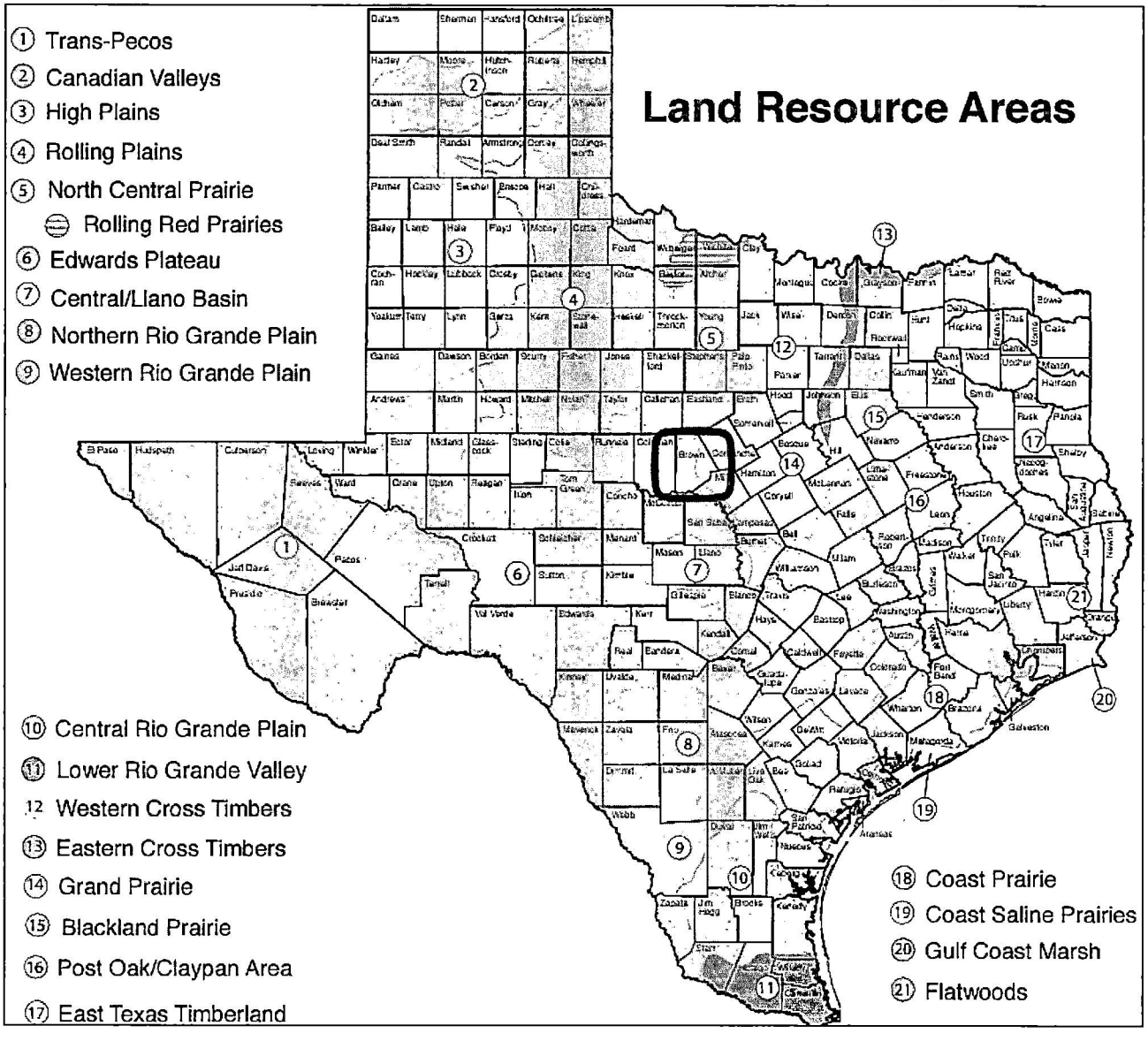


FIGURE 6-23. *Soil Survey, USGS*[46]

Dark Blue: Sandstone, Shale, Mudstone, Conglomerate, Siltstone, and Limestone
Light Green: Conglomerate, Sandstone, and Limestone
Green: Limestone, and Claystone alternating
Yellow: Flood plain deposits; gravel, sand, silt, and Clay
Peach: Mudstone, Shale, Sandstone, and Limestone

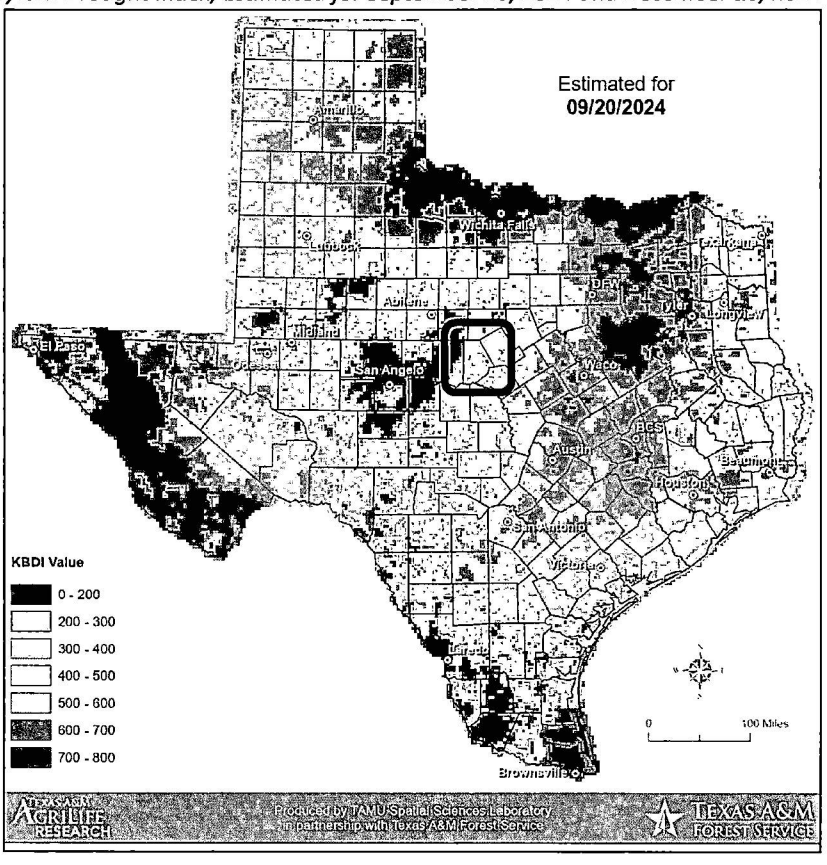
[46] https://webapps.usgs.gov/txgeology/

WILDFIRE

SIGNIFICANT IMPACT

LOCATION	Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early. Not confined to any specific geographic location but are most likely to occur in open grasslands. The threat to people and property is greater where developed areas meet open grasslands (Wildland Urban Interface (WUI)).
EXTENT	Wildfires are fueled by natural vegetation; interface or intermix fires are urban/wildland fires are fueled by natural vegetation and the built environment. Wildfires often begin unnoticed and spread quickly, lighting brush, trees, and homes on fire. Wildfires often spread more rapidly uphill or as they reach the tops of trees. Risk for wildfires 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 and wildland fire potential based on a daily water balance, derived by balancing a drought factor with precipitation and soil moisture. This risk assessment tool is updated daily and should be referenced as the area experiences changes in precipitation and soil moisture. The KBDI demonstrates values for a snapshot in time.
HISTORICAL OCCURRENCES	Significant increase in number of wildfires across Texas in the last 35 years, including wildland and interface (or intermix) fires. From 2005 to 2021 (volunteer fire departments began reporting wildfires in 2005), nearly 1,700 wildfires were reported across Brown County by local or state agencies resulting in approximately 30,000 burned acres with a wide range of causes: campfires, burning debris, equipment use, lightning, power lines, railroads, smoking, etc.
PROBABILITY	The 2024 Brown County Community Wildfire Protection Plan (WCPP) assessed the wildfire risk per jurisdiction. The risk assessment findings for the WCPP ranged from high to extreme county-wide. The planning team identified wildfires as a severe risk during HMAP planning. Wildfires can occur at any time of year, and it is highly likely an event will occur within the next year (average of >2,600 acres of losses annually county-wide, >100 acres of losses annually in the City of Bangs).
VULNERABILITY / IMPACT	Over 70% of the total population within Brown County and participating jurisdictions live within the WUI; however, the entire county is at risk for wildfires. The wildfire ignition density is high, and the characteristic rate of speed (chains per hour) is significantly high for Brown County. Wildfire incidents may have devastating impacts to wildlands, pastures, livestock, structures, and people. Displacement of residents, road closures, continuity of operations, increased flooding due to charred ground, disrupted tourism, response and recovery costs, and economic disruption are all potential impacts. Diminished air quality poses a significant risk to public health. Potential for multiple deaths and injuries, facility (including government and non-government) shutdowns of >30 days, and >50% of affected properties may be destroyed or suffer major damage is substantial. Historically, Brown County has not experienced losses at these levels so the impact from a wildfire may be considered minor; however, the severity of impact from a major wildfire can reach those levels.

FIGURE 6-24. *Keetch-Byram Drought Index, Estimated for September 20, 2024 and December 10, 2024*



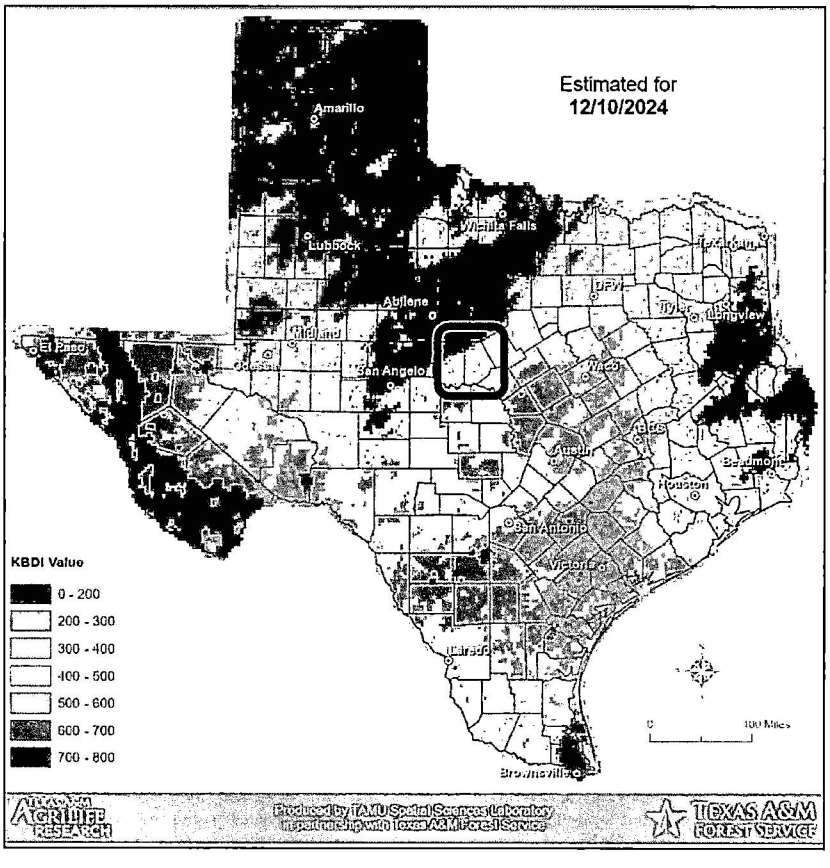


FIGURE 6-25. *Wildland Urban Interface, Brown County Community Wildfire Protection Plan, 2024*

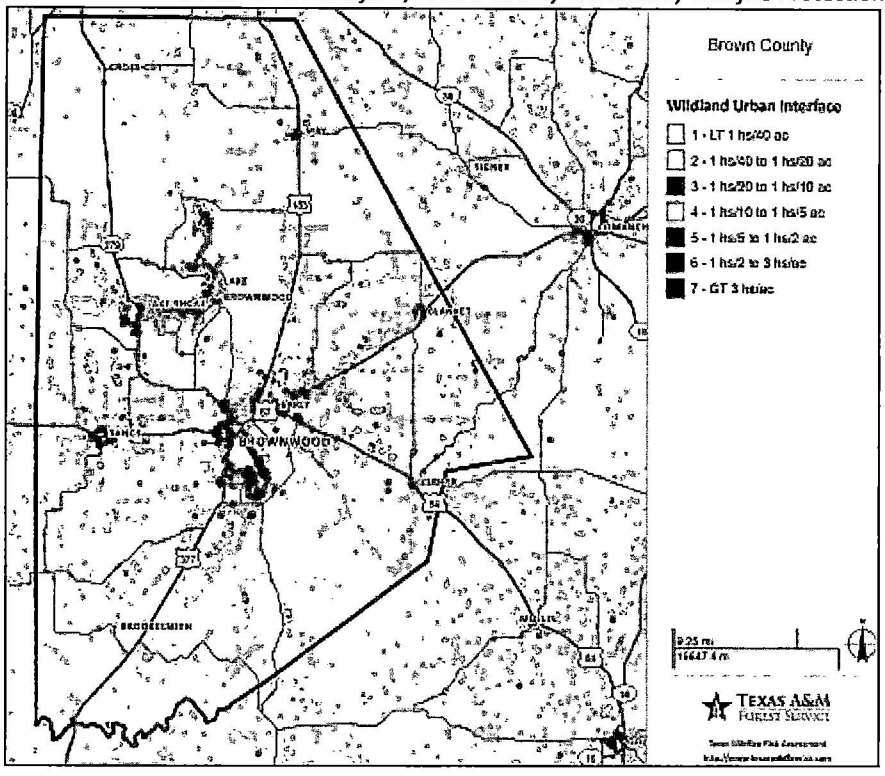


FIGURE 6-26. *Wildland Ignition Density, Brown County Community Wildfire Protection Plan, 2024*

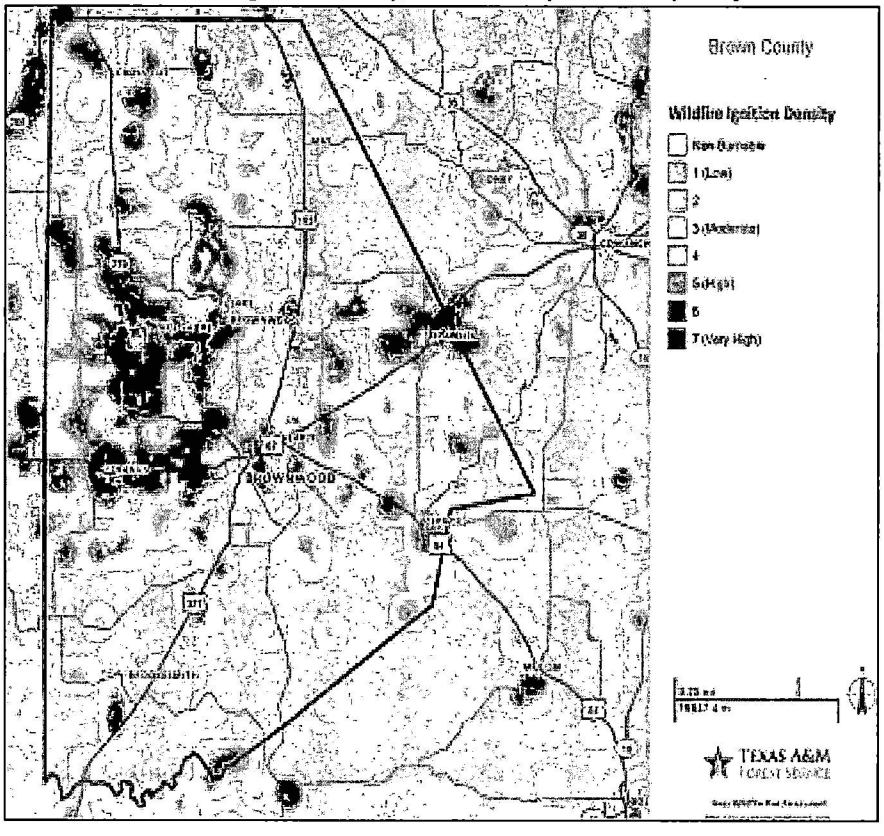


FIGURE 6-27. *Characteristic Rate of Speed, Brown County Community Wildfire Protection Plan, 2024*

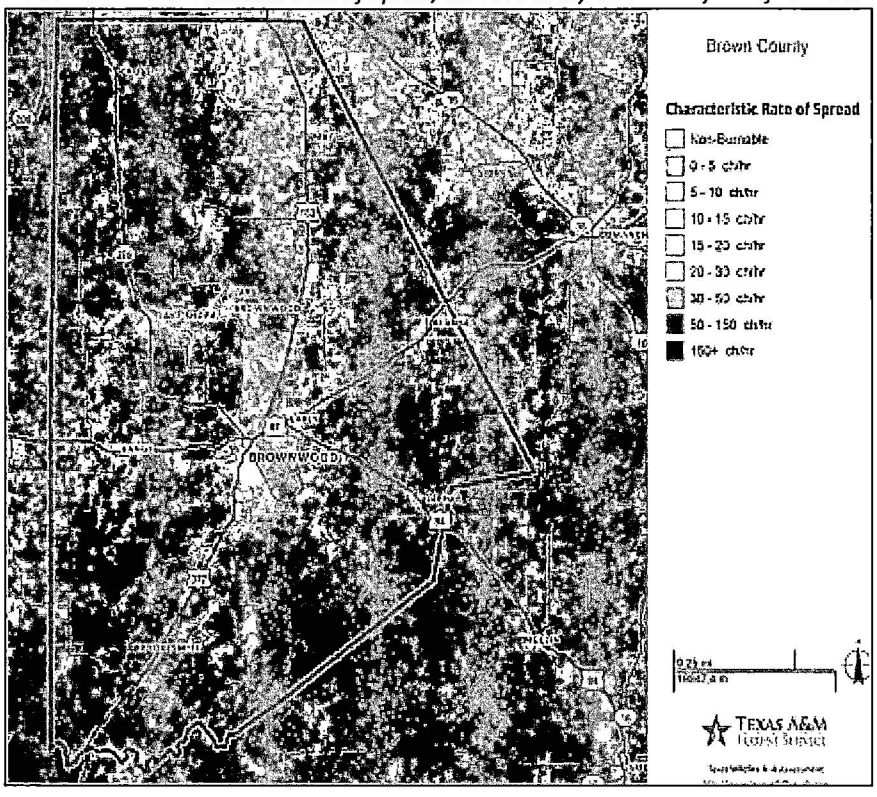
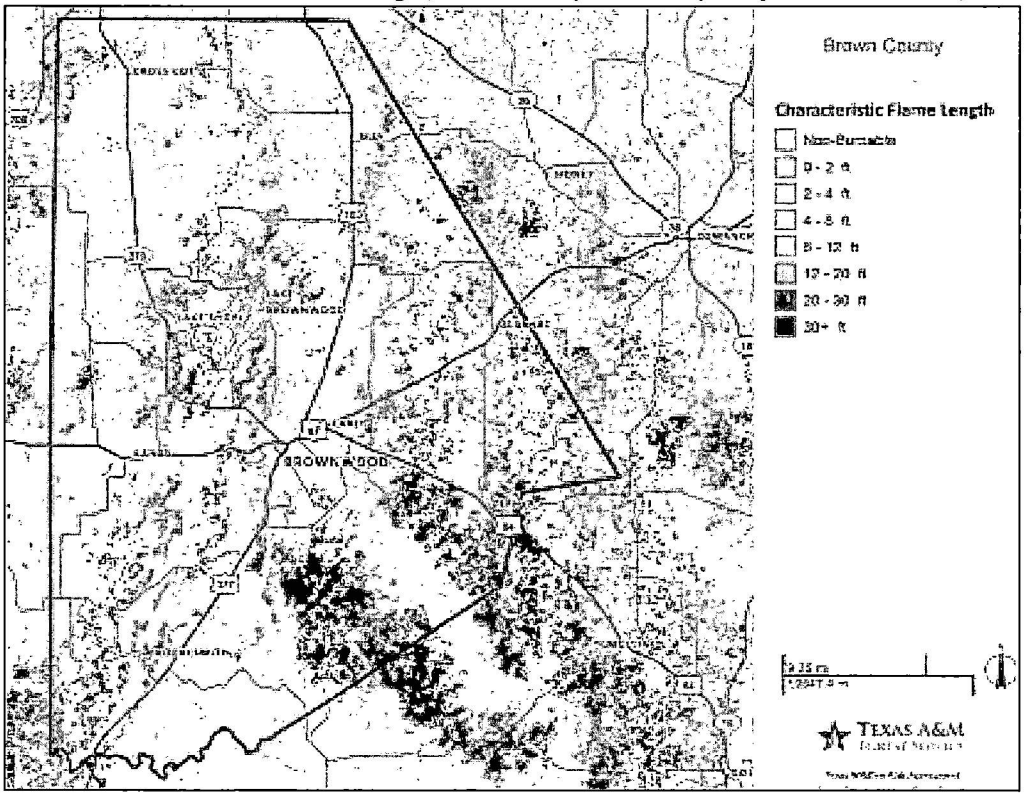


FIGURE 6-28. *Characteristic Flame Length, Brown County Community Wildfire Protection Plan, 2024*



INFECTIOUS DISEASE

LIMITED IMPACT

LOCATION	Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early. Not confined to any specific geographic region.
EXTENT	The extent of an infectious disease is influenced by a number of factors, including: route of transmission (how the infectious agent is passed from one host to another), stability outside the host (how long the infectious agent can survive outside the host), human travel and commerce (the movement of people and goods can introduce infectious agents to new areas), changes in human demographics and behavior (these can lead to the emergence of infections), and the breakdown of public health systems (socioeconomic conditions can impact the risk level of infectious disease). The most common causes of infectious diseases are viruses, bacteria, fungi, and parasites. Infectious disease usually spread from person to person, through contaminated food, water, soil, bug bites, and close contact. Additional complications are associated with infectious diseases such as dehydration, pneumonia, sepsis, meningitis, liver cancer, and cervical cancer. Mitigation and prevention of infectious diseases includes vaccines, safe food handling, hand washing, reducing cough or sneeze aerosolized droplet distance, disinfection of surfaces, and avoiding or protecting against contact.
HISTORICAL OCCURRENCES	Brown County declared two states of disaster in the previous 5 years for Coronavirus Disease 2019 (COVID-19) due to widespread infection. The Brownwood / Brown County Public Health Department consistently monitors infectious disease rates for notifiable/reportable conditions, as determined by the CDC. Conditions reported to the Brownwood / Brown County Public Health Department in the last year include campylobacteriosis, cryptosporidium, hepatitis C, pertussis, salmonellosis, COVID-19, carbapenem-resistant Enterobacteriaceae, Shiga toxin-producing Escherichia coli, hepatitis B, Coccidioides, rickettsiosis, Q fever, rubella, streptococcal pneumonia, hepatitis A, mumps, haemophiles influenzae, salmonellosis, varicella, typhus, and spotted fever rickettsiosis. [47] Respiratory surveillance is conducted and reported weekly by the Brownwood / Brown County Public Health Department for influenza-like illnesses, flu positive tests, and COVID-19 positive tests.[48]
PROBABILITY	Based on data from the Brownwood / Brown County Public Health Department, it is highly probable that incidents of infection for the above listed diseases will continue in similar trends. It is expected that transmission rates and positive tests will increase and decrease periodically based on the factors listed under extent. According to the Texas Department of State Health Services (DSHS), surveillance relies primarily on confirmed case reports from physicians, veterinarians, laboratories, and others. Certain forms of active surveillance exist within Brown County, such as mosquito testing. It should be noted that if a report indicates that an area does not have any positive test results for a particular disease, it does not necessarily mean that the disease organisms are not in that area, only that no positive tests have been collected.[49]
VULNERABILITY / IMPACT	Infectious diseases have a significant impact on global health and economies and can be devastating and fatal. Some of the ways infectious diseases affect people include: mortality (leading cause of death worldwide, especially in vulnerable populations), disability (can lead to long-term disability), emerging diseases (some are new, while others are increasing in incidence or geographic range), vulnerable Populations (disproportionately affect vulnerable populations such as children under 5, elderly over 65, individuals with a suppressed immune system, pregnant women, and individuals with limited access to healthcare), long-term health effects (can increase the long-term risk of other conditions). The participating jurisdictions have implemented several mitigation measures to minimize the impact of an infectious disease outbreak, epidemic, or pandemic. The vulnerability and impact depend on the size and scope of the outbreak; however, minimal limitations to operational continuity exist. NOTE: An infectious disease hazard must also be considered as a potential technological and human caused hazard.

[47] https://www.brownwoodtexas.gov/629/Notifiable-Conditions
[48] https://www.brownwoodtexas.gov/637/Respiratory-Surveillance
[49] https://www.dshs.texas.gov/notifiable-conditions/disease-surveillance

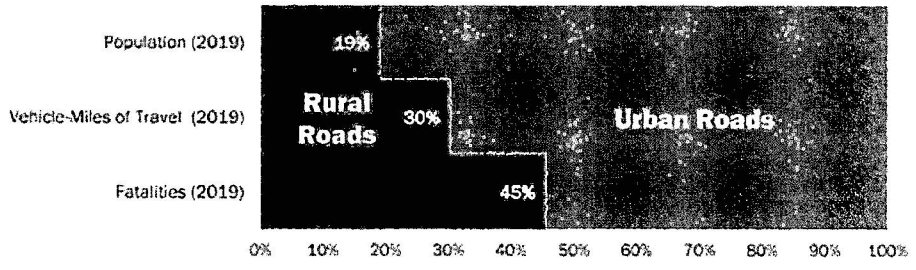
Technological Hazards

TRANSPORTATION INCIDENT (ROADWAYS)

LIMITED IMPACT

LOCATION	Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early. Not confined to any specific geographic region; however, a transportation incident for the purposes of the HMAP is one that overwhelms local resources. This may be more likely in areas of limited resources, such as rural roads and communities.
EXTENT	More than 370,000 people died in transportation incidents between 2011 and 2020 in the United States, with 350,000 of those occurring on roadways.[50] The rural fatality rate of transportation incidents is approximately two times higher than the urban fatality rate due to limited resources and delayed response times. An incident in a rural area with multiple casualties would feasibly result in delayed response times, extended travel times to an appropriate emergency department, and gaps in first responder coverage in other areas as resources are redirected to the incident. Fatality rates are higher on non-interstate arterial and local roadways. Brown County has 115 miles of paved highways and over 700 miles of all-weather lateral roads (357 miles US highways, 92 miles state highways, 626 miles farm to market roads, 591 miles city streets, 2,269 miles county roads).[51] Fatalities and fatal crashes occur disproportionately, by both population and vehicle travel, on rural roads:

FIGURE 6-29. *Fatalities by Road Time, Fatality Analysis Reporting System, U.S. Census*



HISTORICAL OCCURRENCES	Multiple severe transportation accidents occur annually within the participating jurisdictions; however, no data is currently available regarding historical occurrences that caused resources to be overwhelmed and delayed responses by first responders or medical personnel. Reports are available for traffic accidents with fatalities, but this does not necessarily elevate incidents to the level of HMAP documentation or reporting for the purposes of hazard mitigation.
PROBABILITY	The probability of traffic accidents is extremely likely; however, the probability of a transportation incident that overwhelms services is difficult to predict but should be expected and planned for within the POETE model for emergency management (planning, organizing, equipping, training, and exercising), especially with the high percentage of rural roadways and fatality rates.
VULNERABILITY / IMPACT	All participating jurisdictions recognize that a single transportation incident could overwhelm resources and have identified actions and incorporated planning mechanisms within the local Emergency Operations Plan. All roadways and jurisdictions are vulnerable to a transportation incident that could cause cascading or secondary hazards such as power outages, HAZMAT releases, delayed medical treatment, redirected resources from other areas leaving potential gaps in services, and mass casualty incidents.

[50] https://www.transportation.gov/sites/dot.gov/files/2022-02/USDOT-National-Roadway-Safety-Strategy.pdf
[51] https://txcip.org/tac/census/profile.php?FIPS=48049

AIRCRAFT INCIDENT

LIMITED IMPACT

LOCATION	Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early. Not confined to any specific geographic area. At any given moment, an average of 5-15 aircraft are flying in Brown County airspace with varying flight plans.
EXTENT	The extent of an aircraft incident can be measured by the damage to aircraft, damage to infrastructure at or near the crash site, the number of people injured or killed, and whether the aircraft goes missing.
HISTORICAL OCCURRENCES	1987 – Two military reconnaissance jets collided and crashed in flames in a remote area with human remains found near Lake Brownwood. 2005 – Airplane crashed while attempting night landing at Brownwood Regional Airport. Airplane struck electrical wires, trees, and the ground outside of the airport resulting in one fatality, fires, and power outages. Since 1966, 12 fatal airplane crashes have been reported within Brown County, geographically centered near the Brownwood Regional Airport outside of Brownwood and Early. Based on data from the National Transportation Safety Board, a total of 2,751 fatal airplane crashes have occurred across Texas since reporting began in 1966.[52]
PROBABILITY	Based on the number of reported incidents within the county and state, approximately 1 fatal airplane crash occurs within Brown County every 4.5 years and 47 fatal aircraft incidents occur annually across Texas. This indicates a high probability of another incident within the next 5 years. Although the statistical number of aircraft that have crashed in the last 10 years is 0.000001%, the actual number of incidents suggests a relatively likelihood of occurrence.
VULNERABILITY / IMPACT	The Brownwood Regional Airport has terrain that has been identified as a hazard for a pilot unfamiliar with the airport landing at night. First responders on the scene of a 2005 incident reported that although the runway and airport were visible from the accident site, the terrain gave the perception of a black hole as it descended and quickly ascended again with no lighting. The impact of an aircraft incident is dependent on many factors including, size and type of aircraft, number of passengers, type of cargo, location of crash, and critical infrastructure affected.

FIGURE 6-30. *Aircraft Incident Locations, 1966 – 2024*

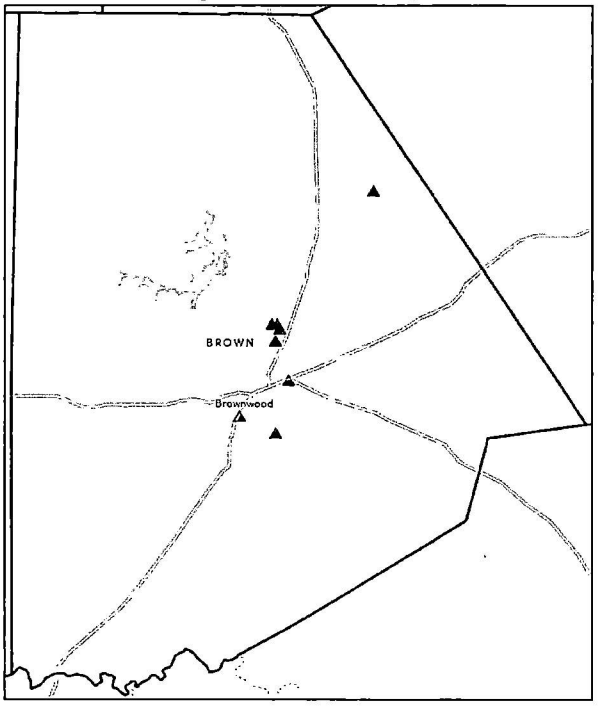


TABLE 6-18. *Aircraft Incident Locations, County-Wide*

TAIL NUMBER	LATITUDE	LONGITUDE
N8334P	31.916670	-98.866670
N5963F	31.789444	-98.953889
N972NR	31.793611	-98.956389
N805SB	31.789444	-98.953889
N6393R	31.793611	-98.956389
N4311S	31.793611	-98.961111
N3472	31.789444	-98.953889
N43656	31.789444	-98.953889
N1750A	31.778334	-98.957778
N6147N	31.742096	-98.945605
N613MC	31.709320	-98.991161
N78690	31.693611	-98.957500

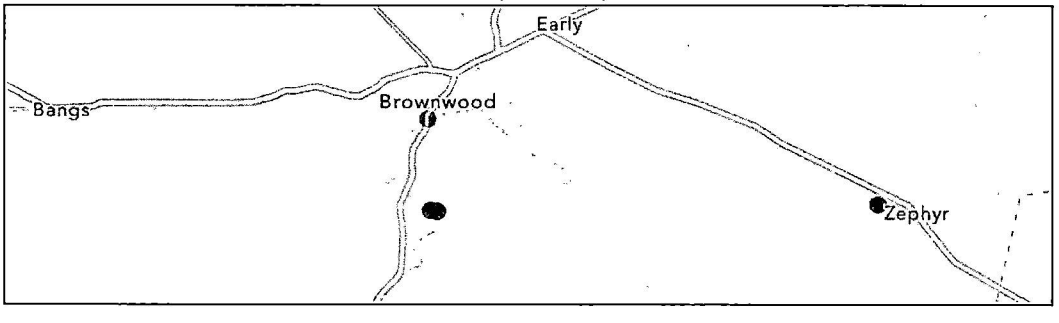
[52] https://planecrashmap.com/list/tx/

TRAIN DERAILMENT

MODERATE IMPACT

LOCATION	Bangs, Blanket, Brownwood, and Unincorporated areas along railways in Brown County.
EXTENT	The extent of train derailments depends on location, speed, conditions, surrounding area, casualties, and damages.
HISTORICAL OCCURRENCES	2015-11-29, 1800 – Brownwood, BNSF Railway Company: freight train derailed 6 cars due to defective or missing crossties while pulling onto single main track from yard track. No HAZMAT was released, no injuries, and no deaths were reported. The total damage was $235,711, including $65,711 in equipment and $170,000 in track costs. 2017-06-17, 1440 – South of Brownwood, Texas Rock Crusher Railway Company: the switch improperly lined resulting in derailment of 3 cars while traveling at low speeds. The train included 9 HAZMAT cars (3 damaged). Zero injuries or deaths were reported. The total damage was $31,851, including $21,580 in equipment and $10,271 in track costs. Reports state that the engineer ran through the switch, stopped on top of it and reversed movement causing 3 cars to derail. 2017-01-10, 0442 – Southeast Brown County near Zephyr and Hwy 84, BNSF Railway Company: freight train derailed 1 car resulting in total damages of $39,288 due to a broken rim. No HAZMAT was released, no injuries, and no deaths were reported.
PROBABILITY	Approximately 3 train derailments occur in the US each day with as many as half potentially carrying hazardous substances. Nearly 1 in every 5 cities have been affected by rail incidents since 2020 and two-thirds of all rail accidents happen within cities. On average, cities experienced 6 reports of rail incidents for every 10,000 people. Derailments are the most common type of accident to happen in a city (68%) and more than half of all accidents are derailments (51%). Small cities are disproportionately affected by rail accidents. Cities with fewer than 1,000 residents have an average of 12.9 accidents as compared to 3.1 for cities between 1,000 and 10,000 and less than 1 for cities over 50,000. More than half of cities (58%) are touched by the national rail network. While train accidents happen in every region, there are more overall in the west than any other region. According to the Federal Railroad Administration, there were 952 Class I freight train derailments in 2022, the majority of which took place in rail yards with no HAZMAT release, injuries, or fatalities, (affirming historical data for Brown County).
VULNERABILITY / IMPACT	The impact of train derailments ranges from minimal to catastrophic depending on various factors, including location, cargo, local preparedness, and local resources. Minimal funding is dedicated to boost the capacity for technical assistance, local level planning, and derailment disaster response equipment and trainings outside of urban centers nation-wide. Minimal advanced notification and warnings are communicated to local jurisdictions regarding hazardous cargo. Existing gaps in communication between the public and private sector, HAZMAT response planning gaps, and a lack of plan sharing and coordination across the country have contributed to higher levels of vulnerability and impacts from catastrophic train derailments, especially for vulnerable populations. Four hazardous materials commonly transported on railways include crude oil, ethanol, vinyl chloride, and methane which all carry significant risks to public health, the environment, and the economy.

FIGURE 6-31. *Train Derailment Locations, January 2012 - April 2023*[53]



[53] https://www.nlc.org/resource/interactive-rail-safety-map-see-derailments-in-communities-across-the-u-s/

COMMUNICATION AND/OR COMPUTER DATABASE FAILURE

LIMITED IMPACT

LOCATION	Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early. A communication failure can occur at any time in any geographical location across the county when there is a loss of connection to the appropriate system.
EXTENT	A database failure can occur when one or more databases become unavailable or are beyond repair, which can lead to data loss, a significant hazard when considering databases utilized by hospitals, EMS, 911 dispatch, law enforcement, public and private utilities, schools, and other pertinent government operations. Some causes of database failure include hardware failure, such as disk failures, power outages, or network errors; human errors; application code changes; database version upgrades; and configuration changes. These examples fall into three broad categories: soft failures, hard failures, and network failures. To prevent database failures, organizations and jurisdictions adopt proactive approaches to database management. This includes the implementation of strategies to protect data integrity and ensure operational continuity. Communication failures within healthcare, disaster response, manufacturing, and hazard communication can be disastrous. Four service organizations provide state-wide interoperability radio communications and maintenance for a fee. Brown County currently utilizes the Lower Colorado River Authority (LCRA). In 1997, the LCRA implemented a trunked radio communications system, which is operated under licenses from the Federal Communications Commission (FCC), for use throughout the LCRA's service territory. The LCRA radio system has the capacity to provide clear, reliable communications service to governmental entities, electric utilities, and other public safety entities. With more than 100-700 MHz and 900 MHz radio tower sites located strategically across LCRA's service territory, radio coverage reaches more than 50,000 square miles. More than 25,000 mobile radio users rely on the LCRA system for daily communications, including Brown County.
HISTORICAL OCCURRENCES	No data is presently available relating to historical occurrences of communication and/or computer database failures within the participating jurisdictions; however, planning team members and first responders cite ongoing concerns with radio communication and interoperability.
PROBABILITY	The likelihood is high that communication and/or computer database failures will occur over the next 5 years of this HMAP, but the severity and extent are difficult to estimate. Communication-related factors adversely affect people's capacity to prepare for disasters (increasing individual and community vulnerability to disaster).
VULNERABILITY / IMPACT	All communication systems and databases are vulnerable to failure. The impact of these failures is significant during disaster preparedness, response, and recovery activities and have the capability to result in increased vulnerability to secondary hazards. Clear, coordinated, and reliable communications are essential. Without effective and intact communication systems and/or computer databases, coordination of operations and public awareness capabilities are compromised, increasing the risk of other hazards. The Emergency Communications Ecosystem includes 4 multi-directional components to ensure operability, interoperability, and continuity of emergency communications: public interaction; alerts, warnings, and notifications; incident coordination and response; and reporting and requests for assistance[54]. To add or improve radio communications infrastructure, it takes approximately 1 year to build a radio tower and install the required equipment at a cost of nearly $2 million for the tower and $700,000 for the equipment (pending no supply chain and construction disruptions are encountered). Additional costs would be incorporated for service fees, radios, insurance, and maintenance unless partnerships are entered into with available state agencies. The WCTCOG counties have been identified by the Texas Statewide Communications Interoperability Maturity Model based on SAFECOM Interoperability Continuum as Level 3 defined as mid-range interoperability using shared channels, below current expectations, and standards.

[54] https://www.cisa.gov

FIGURE 6-32. *Texas Statewide Communications Interoperability Maturity Model (DPS)*

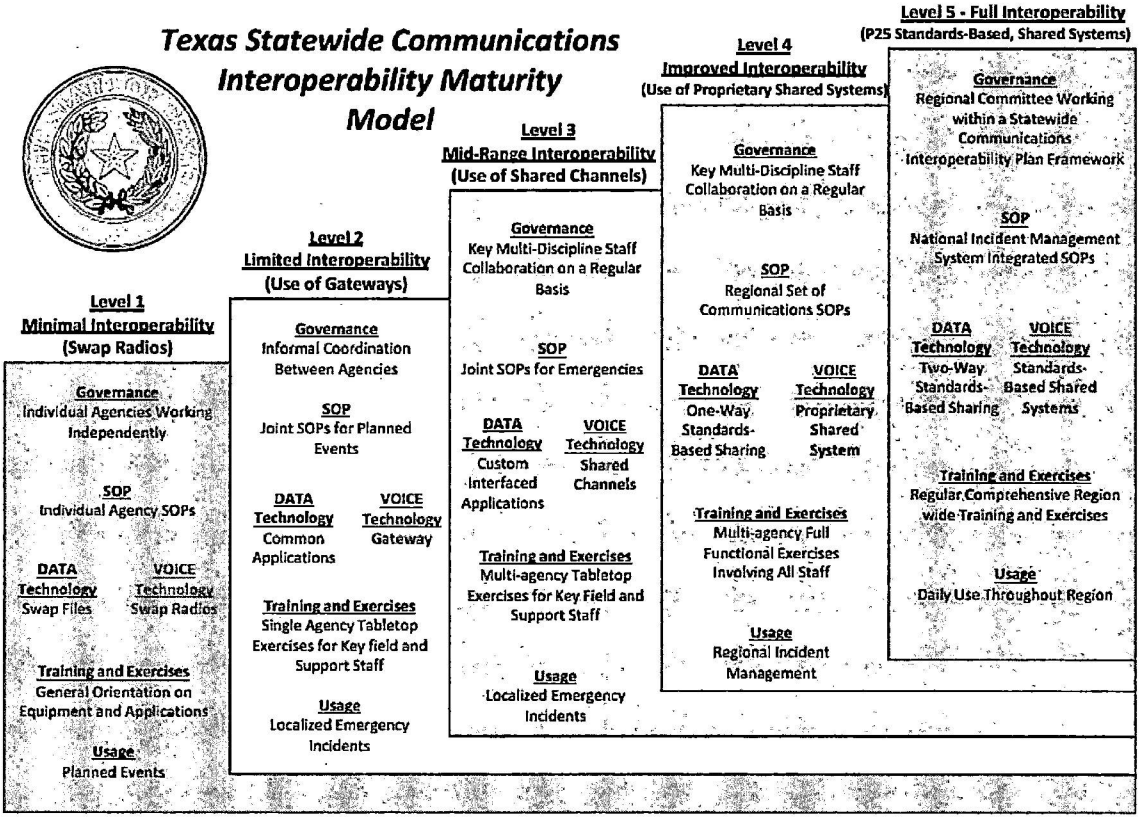


FIGURE 6-33. *SAFECOM Interoperability Continuum (CISA)*

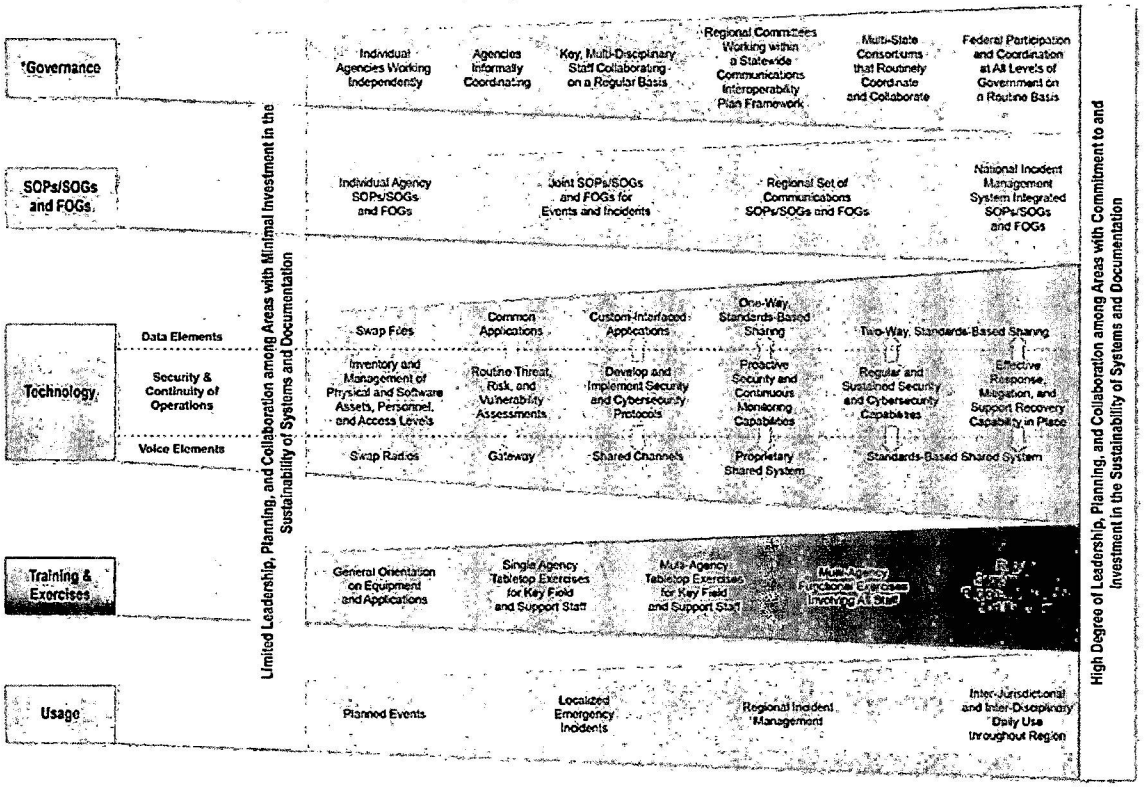
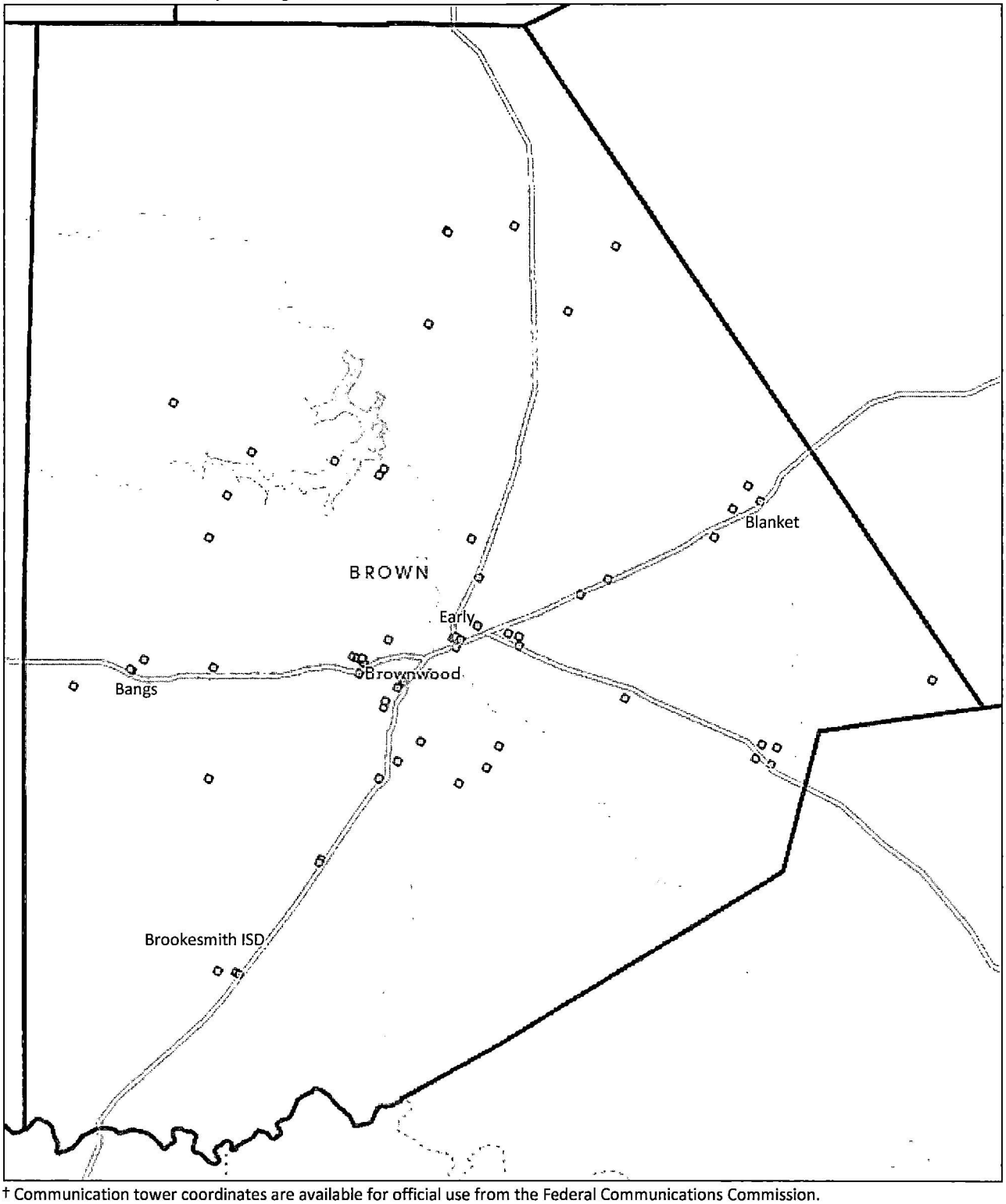


FIGURE 6-34. *Brown County Existing Communication Towers*



† Communication tower coordinates are available for official use from the Federal Communications Commission.

DAM FAILURE

44 CFR REQUIREMENT
Requirement HHPD The plan describes the incorporation of existing plans, studies, reports, and technical information for HHPDs.
Requirement HHPD The plan describes how the local government worked with local dam owners and/or the state dam safety agency.
Requirement HHPD The plan incorporates information shared by the state and/or local dam owners.
Requirement HHPD The plan describes the risks and vulnerabilities to and from HHPDs.
Requirement HHPD The plan documents the limitations and describes how to address deficiencies.
Requirement HHPD The plan addresses how to reduce vulnerabilities to and from HHPDs as part of its own goals or with other long-term strategies.

	MODERATE IMPACT
LOCATION	Blanket, Brookesmith ISD, Brownwood, and other unincorporated areas of Brown County are subject to the immediate hazards of dam failure. No HHPDs are located in or near Bangs. No HHPDs are located in Early. The National Dam Safety Review Board and the National Inventory of Dams lists 70 dams in Brown County regulated by the TCEQ.
EXTENT	Dam failures can occur quickly and without much warning, causing severe flash flooding in the surrounding area and result in property damage and loss of life. • Widespread flooding • Destruction of property and infrastructure downstream • Loss of life • Disruption of water supplies • Environmental damage to ecosystems • Economic losses due to the destruction of homes, businesses, and vital services in the affected area
HISTORICAL OCCURRENCES	No historical occurrences of dam failure with any downstream hazard potential (low to high) have been recorded 2017 – 2023. No historical occurrences of high hazard dam failure have ever been recorded in the participating jurisdictions.
PROBABILITY	Of the approximately 314 dam failures in Texas between 1910 and 2019, half have occurred since 2010. 1/3 of those failures were due to overtopping when water rushes over the top of a dam that is not designed to function in such severe conditions which places the dam structure and nearby structures at risk of damage and collapse. TECQ states that age of the dam is a contributing factor in a failure when the necessary funds to repair or rehabilitate the dam are unavailable. Though Brown County has 30 HHPDs, historical records and projected weather/climate trends suggest a very low probability of dam failure in the next 0-10 years. Given the age of dams in Brown County, this probability may steadily increase over time without mitigation efforts to prevent dam failures and protect against secondary hazards, including flooding, property or crop damages, injuries, and economic impacts. Natural hazards may degrade the structural integrity of earth dams thus prompting the need for frequent reassessment of dam failure probability.
VULNERABILITY / IMPACT	Dam failure was addressed within the local risk assessments; however, dams within Texas are also assessed by TCEQ engineers and classified as low, significant, or high hazard based on potential loss of life and property in the event of failure or malfunction. Each dam was analyzed individually by location, volume, elevation, and condition (where available) when determining the risk, if any. Each dam site was further analyzed for potential risks utilizing FEMA's National Flood Hazard Layer to map locations and fully understand development near the dam and topographical variations that may increase risk. Most of the dams listed were embankments for typically small or dry detention drainage areas or shored up stream embankments. These types of structures are utilized for flood control and do not necessarily pose a dam failure risk. Other dams feature such limited storage capacity that they pose no risk to structures, infrastructure, or citizens. Dams that were deemed to pose no past, current, or future risk to the participating jurisdictions are not profiled in the HMAP as no loss of life or impact to critical facilities or infrastructure is expected in the event of a breach or failure. Brown County, Blanket, Brownwood: residents, emergency responders, homes, businesses, bridges/roads, water supply systems, electrical grids, communication networks, local landmarks, and other economic activities such as farming, ranching, and oil production. Residents and emergency

VULNERABILITY / IMPACT (continued)

responders may face significant challenges, including displacement, health risks, and operational difficulties. Homes, businesses, and local landmarks of historic/cultural significance could suffer extensive damage, with long recovery times and associated burdens. Bridges and roads might become impassable, hindering evacuation and relief efforts. Water supply systems, electrical grids, and communication networks might experience prolonged disruptions, affecting daily life and emergency coordination. Key sectors like farming, ranching, and manufacturing could face operational halts or losses, impacting the local economy.

Additional areas of vulnerability for Brown County: rivers, lakes, ecosystems, and agricultural land. Rivers, lakes, ecosystems, and agricultural land could be severely damaged, with long-term effects on local biodiversity and water quality. Flooding could devastate agricultural land, leading to reduced yields, soil erosion, and financial losses.

Brookesmith ISD: students, staff, buildings and facilities, instructional equipment, ingress/egress roads, parking lots, communication networks, transportation system and assets, academic/non-academic activities. Students and staff may face disruptions in academic and non-academic activities due to damage to buildings, facilities, and instructional equipment. Schools, roads, parking lots, and transportation assets could require extensive repairs or reconstruction. Communication networks necessary for educational activities and emergency responses might be impacted, limiting coordination. The cascading effects could result in widespread economic, social, and environmental challenges for the participating jurisdictions, with recovery dependent on the speed and effectiveness of emergency responses and resource allocation.

High Hazard Potential Dams

Based on this detailed analysis, the planning team was able to determine that thirty (30) of the seventy (70) dams pose a risk to a participating jurisdiction and are classified as a High Hazard Potential Dam (HHPD). Of these 30 HHPD, TCEQ reported 2 public dams in Blanket are deemed to be in poor condition in 2024, classified as unsatisfactory. High Hazard Potential Dams (HHPDs) were assessed for potential cascading impacts of other hazards on dams; potential economic, environmental, or social impacts; and the location and size of PAR from HHPDs and impacts to critical facilities. The Dam Safety Program in Texas monitors and regulates both private and public dams. The program inspects dams that are considered high or significant hazards and provide recommendations to dam owners to help them maintain safe facilities.

Dams in Brown County with identified deficiencies are addressed through jurisdictional planning and budgetary mechanisms to ensure the safety of people and property. Unsatisfactory dams were identified and evaluated for mitigation needs through the risk assessment process. Brown County determined dam failures to be low risk at this time. An evaluation of mitigation needs is necessary; however, funding limitations exist. Reducing vulnerabilities related to dams, specifically HHPDs, is incorporated into the goals and objectives (Goal 2, Objective 2.8), future planning, and mitigation actions (Brown County, Action Item 2). All HHPD are described in the following table. No HHPD is or has associated structures. All besides Brownwood Country Club Lake are public dams. The primary purpose of all HHPD dams is flood risk reduction except two (Lake Brownwood: water supply, Brownwood Country Club: recreation). All HHPD are classified as earth dams except one (Brownwood Laterals WS SCS Site 2: concrete).

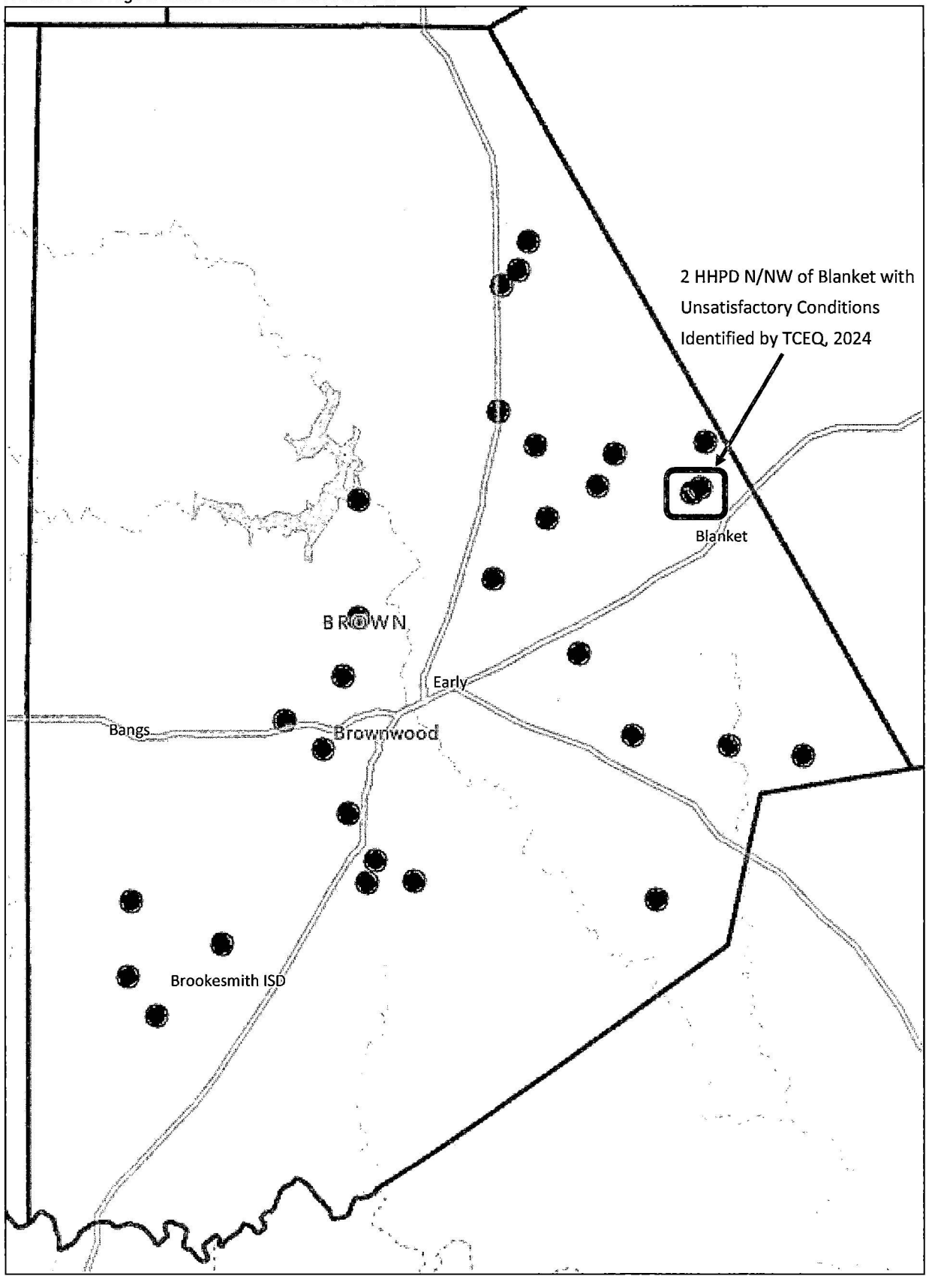
DATA DEFICIENCY: Risk assessment limitations were noted during the planning process due to a lack of inundation mapping.[55] Further research is necessary to compile adequate information on dams related to the hazards and risks of a dam failure within Brown County (and participating jurisdictions) and address deficiencies discovered through inspections and assessments for each HHPD. The Pecan Bayou SWCD, Brown County WID, and Brownwood Country Club were contacted during the planning process regarding the condition and assessment of hazards related to HHPDs. No HHPD mitigation projects were noted during the planning process due to insufficient data; however, further research compile adequate information on dams within Brown County and address deficiencies discovered through inspections and assessments will be conducted. No existing dam safety deficiencies were identified for normal operating conditions for 28 out of 30 HHPDs, according to TCEQ condition assessments. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency. Risk may be in the range to take further action and was discussed during the planning process, specifically related to flooding. Brown County intends to expand the involvement of key stakeholders throughout the planning process, including plan maintenance stages, to improve collaboration and mitigation efforts.

[55] https://nid.sec.usace.army.mil/

TABLE 6-19. *HHPD Identification and Assessment Ratings, National Inventory of Dams, TCEQ, 2024*

DAM NAME	NID ID	OWNER NAME	LATITUDE	LONGITUDE	CITY	CONDITION
Brownwood Laterals WS SCS Site 4b Dam	TX04368	BROWN COUNTY; PECAN BAYOU SWCD	31.642737	-98.998503	BROWNWOOD	Fair
Clear Creek WS SCS Site 4 Dam	TX02750	BROWN COUNTY; PECAN BAYOU SWCD	31.632787	-99.140329	BROOKESMITH	Not Rated
Brownwood Laterals WS SCS Site 8 Dam	TX02790	BROWN COUNTY; PECAN BAYOU SWCD	31.777622	-99.003224	BROWNWOOD	Not Rated
Brownwood Laterals WS SCS Site 4a Dam	TX04367	BROWN COUNTY; BROWNWOOD; PECAN BAYOU SWCD	31.642939	-98.969935	BROWNWOOD	Satisfactory
Blanket Creek WS SCS Site 9 Dam	TX02765	BROWN COUNTY; PECAN BAYOU SWCD	31.712364	-98.779429		Fair
Clear Creek WS SCS Site 3 Dam	TX02748	BROWN COUNTY; PECAN BAYOU SWCD	31.594904	-99.142206	BROOKESMITH	Not Rated
Brownwood Laterals WS SCS Site 22 Dam	TX04323	BROWN COUNTY; PECAN BAYOU SWCD	31.633333	-98.823333		Not Rated
Brownwood Laterals WS SCS Site 11 Dam	TX02783	BROWN COUNTY; PECAN BAYOU SWCD	31.865454	-98.895754	BROWNWOOD	Fair
Blanket Creek WS SCS Site 4 Dam	TX02772	BROWN COUNTY; PECAN BAYOU SWCD	31.841358	-98.802041	BLANKET	Unsatisfactory
Blanket Creek WS SCS Site 15 Dam	TX02754	BROWN COUNTY; PECAN BAYOU SWCD	31.707541	-98.734657		Fair
Upper Pecan Bayou WS SCS Site 31 Dam	TX02786	BROWN COUNTY; PECAN BAYOU SWCD	31.969384	-98.900442	MAY	Fair
Brownwood Laterals WS SCS Site 3 Dam	TX02752	BROWN COUNTY; PECAN BAYOU SWCD	31.677849	-99.009583	BROWNWOOD	Fair
Brownwood Laterals WS SCS Site 17 Dam	TX02782	BROWN COUNTY; PECAN BAYOU SWCD	31.797307	-98.921553	BROWNWOOD	Fair
Blanket Creek WS SCS Site 3 Dam	TX02773	BROWN COUNTY; PECAN BAYOU SWCD	31.843891	-98.796161	BLANKET	Unsatisfactory
Upper Pecan Bayou WS SCS Site 32 Dam	TX02785	BROWN COUNTY; PECAN BAYOU SWCD	31.954908	-98.906588	BROWNWOOD	Fair
Brownwood Laterals WS SCS Site 19 Dam	TX02779	BROWN COUNTY; PECAN BAYOU SWCD	31.759197	-98.870112		Not Rated
Clear Creek WS SCS Site 6 Dam	TX02745	BROWN COUNTY; PECAN BAYOU SWCD	31.611346	-99.085762	BROOKESMITH	Not Rated
Brownwood Laterals WS SCS Site 15 Dam	TX02777	BROWN COUNTY; PECAN BAYOU SWCD	31.844785	-98.85821	BROWNWOOD	Not Rated
Brownwood Laterals WS SCS Site 10a Dam	TX02784	BROWN COUNTY; PECAN BAYOU SWCD	31.883266	-98.918285	BROWNWOOD	Not Rated
Upper Pecan Bayou WS SCS Site 33 Dam	TX04322	BROWN COUNTY; PECAN BAYOU SWCD	31.946681	-98.916584	BYRDS	Fair
Brownwood Laterals WS SCS Site 21 Dam	TX02755	BROWN COUNTY; PECAN BAYOU SWCD	31.717999	-98.837101		Fair
Brownwood Laterals WS SCS Site 16a Dam	TX02781	BROWN COUNTY; PECAN BAYOU SWCD	31.828189	-98.888653	BROWNWOOD	Fair
Brownwood Laterals WS SCS Site 13 Dam	TX02776	BROWN COUNTY; PECAN BAYOU SWCD	31.86172	-98.848054	BROWNWOOD	Fair
Brownwood Laterals WS SCS Site 2a Dam	TX04505	BROWN COUNTY; PECAN BAYOU SWCD	31.725325	-99.047712	BROWNWOOD	Satisfactory
Lake Brownwood Dam	TX02789	BROWN COUNTY WID 1	31.838438	-99.002679	BROWNWOOD	Satisfactory
Blanket Creek WS SCS Site 1 Dam	TX02774	BROWN COUNTY; PECAN BAYOU SWCD	31.867402	-98.793853	BLANKET	Fair
Brownwood Laterals WS SCS Site 2rev Dam	TX04620	BROWN COUNTY; PECAN BAYOU SWCD	31.710607	-99.024751	BROWNWOOD	Satisfactory
Clear Creek WS SCS Site 1 Dam	TX02743	BROWN COUNTY; PECAN BAYOU SWCD	31.575022	-99.124885	BROOKESMITH	Not Rated
Brownwood Laterals WS SCS Site 1 Dam	TX04457	BROWN COUNTY; PECAN BAYOU SWCD	31.747967	-99.012459	BROWNWOOD	Satisfactory
Brownwood Country Club Lake Dam	TX02758	BROWNWOOD COUNTRY CLUB	31.653636	-98.992938	BROWNWOOD	Not Rated

FIGURE 6-35. *High Hazard Potential Dam Locations*

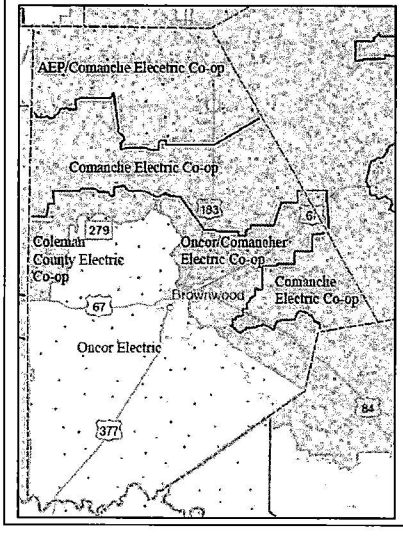


POWER FAILURE

SIGNIFICANT IMPACT

LOCATION	Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early. Not confined to any specific geographic area.
EXTENT	A power failure or outage can result in minimal to significant impacts depending on the size and scope of the outage. The extent includes, but is not limited to: • Public health issues • Electronic equipment damage • Data loss • Appliance damage • HVAC system disruption • Frozen pipes • Food spoilage • Battery damage • Medical equipment disruption • Communication disruptions • Economic losses
HISTORICAL OCCURRENCES	Brown County currently has 25,491 power customers. All power outages are tracked by customer, geographical area, and length of outage from aggregated data pulled from individual utility producers and distributors[56]. Brown County has experienced significant, widespread power failures due to severe storms several times. For example, the following significant events impacted Brown County: • 2022 December Winter Storm (12/23/2022 – 12/27/2022) • 2021 February Winter Storm (02/14/2021 – 02/19/2021)
PROBABILITY	The probability that another power failure event will occur is highly likely within the next year. A widespread power failure across the county and/or region is likely to occur within the next five years.
VULNERABILITY / IMPACT	Brown County is vulnerable to widespread power failures due to severe weather. ERCOT and PUC work to limit the effects of power failures; however, the impacts are felt throughout the response and recovery phases locally and regionally. Disrupted services, food spoilage, water contamination, health risks, loss of data, and economic impacts are likely secondary hazards of power failures. Vulnerable populations are at a higher risk to adverse impacts.

FIGURE 6-36. *Electric Distribution by Region*[57]



Multiple power distributors operate within Brown County, regulated by ERCOT and overseen by PUC. These include:

AEP (northern Brown County [covering unincorporated areas])

Comanche Electric Co-Op (Northern and Eastern Brown County [covering unincorporated areas, Blanket, Brownwood, and Early])

Oncor (Southern Brown County [covering unincorporated areas, Bangs, Blanket, Brookesmith ISD, Brownwood, and Early])

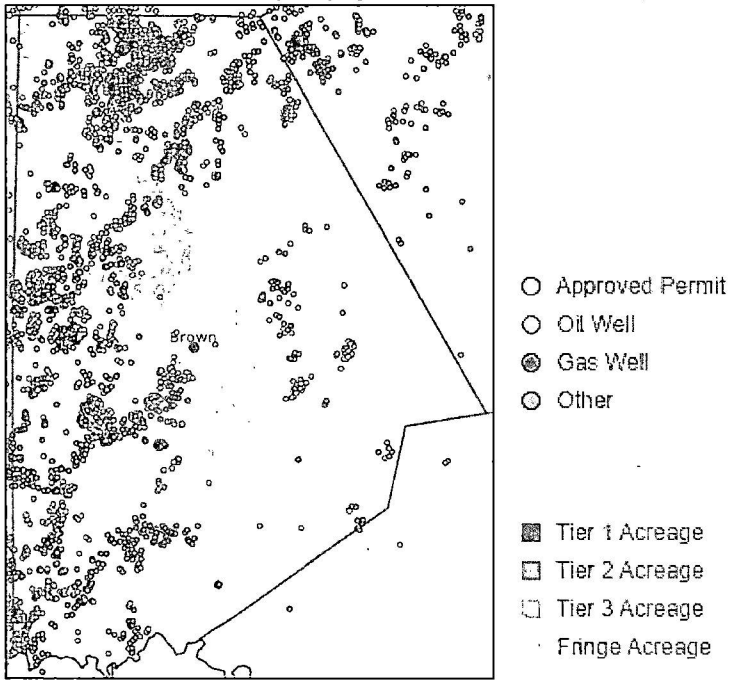
Coleman County Electric Co-Op (Western Brown County [covering unincorporated area])

[56] https://data.swtimes.com/national-power-outage-map-tracker/area/brown-county-tx/48049/
[57] https://www.puc.texas.gov/storm/map.aspx

HAZMAT RELEASE

	MODERATE IMPACT
LOCATION	Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early. Not confined to any specific geographic area.
EXTENT	The size and scope of the event is largely dependent on what, where, when, and how the hazardous material was released. The release of hazardous materials can have a wide range of impacts on people, the environment, and critical infrastructure including: • Health (skin or eye irritation to serious conditions like cancer, birth defects, reproductive impairment, death) • Environment (soil and water contamination, death of plants and animals, damage to ecosystem survivability capacity) • Property (damage to personal and business property, public sector property, and critical infrastructure) • Transportation (interfere with public or commercial transportation, supply chain, and emergency response access) • Evacuations (may require evacuation from homes and businesses causing additional economic and health concerns) • Fire and explosion (some hazardous materials are flammable or explosive resulting in additional safety concerns and further damage)
HISTORICAL OCCURRENCES	No specific data is available to provide a comprehensive listing of historical occurrences; however, fire departments within Brown County report HAZMAT incidents are common (often small events).
PROBABILITY	The probability of a HAZMAT release incident is highly likely within the next year; however, a large event with high numbers of casualties, property damage, or environmental damage is less likely to occur within the next year. As the types and amounts of HAZMAT are used and transported within and across the county the probability of an event is likely to increase.
VULNERABILITY / IMPACT	The Brownwood Fire Department has obtained additional personnel and resources to respond to HAZMAT incidences and provides mutual aid support to all other participating jurisdictions. This improved response capability has decreased the county's vulnerability and potential impacts of a HAZMAT incident; however, training and resources should continue to further minimize vulnerabilities.

FIGURE 6-37. *Brown County Map of Current Permits and Wells, Oil and Gas Production (Mineral Answers)*



FACTORY EXPLOSION

LIMITED IMPACT

LOCATION	Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early. Primarily urban areas within Brown County where factories are operational.
EXTENT	Factory explosions can result in severe burns, blast injuries, and death. The explosion of a manufacturing plant can damage the facility, surrounding structures, and infrastructure.
HISTORICAL OCCURRENCES	No factory explosions have been reported in Brown County. Several minor fires have occurred with little to no damage or injuries. The surrounding region has experienced several explosions within manufacturing facilities. For example, 5 employees suffered severe burns and were transported via EMS to a local hospital after an explosion at a factory in Temple, TX in September 2024.
PROBABILITY	Multiple factories and facilities are operational within Brown County and Brownwood. The possibility of an explosion is higher than the probability based on historical occurrences.
VULNERABILITY / IMPACT	Factories are embedded within urban centers which increases the impact to surrounding areas. The employees, structures, and emergency response personnel are vulnerable to the impacts of an explosion. These include the impacts of a HAZMAT release incident with additional potential for blast injuries and damages. Many of the factories within Brown County are integral to the economic health of the region, employing local residents and providing goods and services nationally and internationally. As of the first quarter of fiscal year 2024, there were 879 private establishments in Brown County. Manufacturing is one of the largest industries in Brownwood, employing 2,395 people.

STRUCTURE COLLAPSE

MINIMAL IMPACT

LOCATION	Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early). Not confined to any single geographical area.
EXTENT	The extent of a structure collapse is dependent on the size of the structure, location of the structure, the number of people within or near the structure, the ease of ingress or egress of emergency services to the structure, and how the structure was tied to the economic or cultural needs of the community.
HISTORICAL OCCURRENCES	No historical record or structural collapses was found for the participating jurisdictions; however, multiple roof collapses have been reported. Public and private structures are continuing to age, and many were constructed prior to the adoption of improved building codes.
PROBABILITY	A significant structure collapse is unlikely within the next year.
VULNERABILITY / IMPACT	Structural failures can cause a building to collapse partially or totally when internal load bearing structural elements fail. The building collapses into itself and exterior walls are pulled into the falling structure. This can occur during construction activities, can be secondary hazards to earthquakes or fires, and can result in a relatively small footprint of dense debris. The consequences and impact of a structural collapse or failure can result in catastrophic injuries or death and significant damage to property, including buildings, bridges, and other structures. Secondary impacts of a structural collapse include water system breaks, pathogen and/or HAZMAT exposure, exposed electrical wiring, insufficient oxygen during search and rescue, confined spaces, protruding or sharp objects and rebar, falling debris, secondary collapses, contamination, and fire.

URBAN FIRE (UNINTENTIONAL)

LIMITED IMPACT

LOCATION	Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early. Unintentional urban fires can occur within all participating jurisdictions.	
EXTENT	Unintentional urban fires can be caused by cooking, electrical circuits, smoking, heating, human error in the workplace, candles, and clutter. Other causes, include unforeseen ignition, natural causes such as earthquakes or lightning, clothes dryers or other mechanical household equipment, electric blankets, and chemical spillages. The extent to which an urban fire reaches the level of hazard mitigation planning includes fires that spread to additional structures and overwhelm the resources available.	
HISTORICAL OCCURRENCES	Fires in urban areas of Brown County occur annually; however, no notable urban fire incidents have been reported with an escalated hazard risk, casualties, or property damages that required additional outside resources for response and recovery.	
PROBABILITY	Fires in urban areas of Brown County occur annually. An urban fire affecting 1,000 people or more is highly unlikely. The economy is not likely to be significantly impacted by a fire in an urban area to the point that it meets the minimum threshold for emergency declarations. While an urban fire can affect habitat and species, the probability that the fire will destroy 10% of a habitat or kill 10% of a species is considered highly unlikely.	
VULNERABILITY / IMPACT	Urban fires are classified as uncontrolled burning in a residence or building with a potential for rapid spread to adjoining structures. Local fire departments are tasked with the response and control of urban fires. Certain areas within the participating jurisdiction are more vulnerable than others due to building construction, location, adjoining structures, unmaintained alleys and blocks, and population. Zoning, building codes, building materials, trained firefighters, specialized apparatus, and early detection technology have mitigated urban fires. Sustained mitigation efforts over the past century have reduced the risk of a significant urban fire but urban fires continue to kill people and destroy millions of dollars in property each year across the region and state. Urban fires will happen and sometimes result in tragic consequences, regardless of the cause: acts of negligence, chance occurrences, arsonists, terrorism, riots, warfare, or earthquakes (each with varying levels of relatively low risk within Brown County). Brownwood has several structures in close proximity. The use of fire protection devices such as fire sprinklers and smoke detectors can greatly reduce the loss from a fire. Historically, most urban fires start in outside areas or vehicle areas; however, urban fires that start within functional areas within the structure often result in the highest property loss. Vulnerable populations without fire protection devices or physical disabilities that delay or obstruct evacuation are at the highest risk of injury or death. In general, children under 5 and senior citizens have the highest risk of dying in a fire. Men are twice as likely to injured or die in a fire than women.	
RESIDENTIAL/ COMMERCIAL FIRE STATISTICS (TEXAS)	Fire Deaths (2022)	359 (12/1,000,000) 1.7 deaths/1,000 fires
	Fire Casualties (2022)	4.2 injuries/1,000 fires (residential structures only: 18.3 injuries/1,000 fires) 6.2 deaths/1,000 fires
	Fire Death Risk	Children under 5 (nearly double average population) Senior Citizens (more than double average population)
	Fire Extinguishers	Portable fire extinguishers are effective at putting out nearly 95% of reported fires (public awareness and education reduces the risk of residential and commercial fires leading to casualties and rapid spread to adjoining structures that overwhelm response resources)

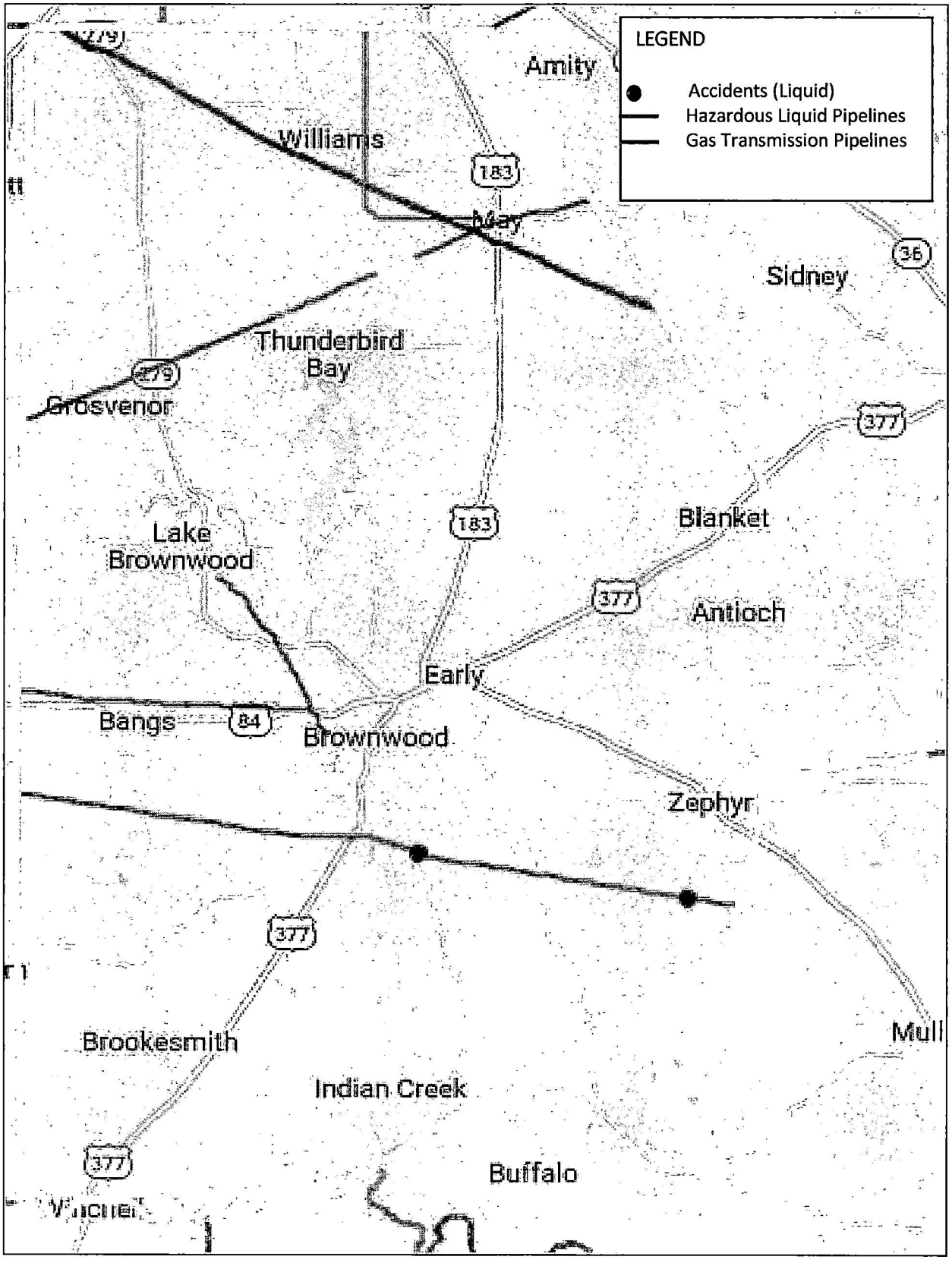
PIPELINE SPILL/ RELEASE

MODERATE IMPACT

LOCATION	Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early. The location of potential pipeline spills or releases is restricted pipeline locations, surrounding areas, and other modes of transport affiliated with pipelines.
EXTENT	Pipeline spills can have significant impacts on the environment, communities, and economies. The extent of damages depends on the type of spill, the location, and the type of material involved. Oil spills can damage plants, kill fish and wildlife, and disrupt ecosystems. Natural gas and highly volatile liquids are more likely to combust than other pipeline materials. Spills in waterways are particularly damaging because water movement spreads the oil over a wide area. The severity of combustion depends on the pipeline material and type. It can be difficult to quickly detect a leak on an underwater pipeline, especially a crack-type release.
HISTORICAL OCCURRENCES	Recent spills in Texas include: Flint Hill Resources (spilled 14,000 gallons into Corpus Christi Bay, December 2022) Jay Management (spilled in Liberty County, January 2024) Shell Pipeline Company (spilled 1,260 gallons into Gulf Intracoastal Waterway, April 2024)
PROBABILITY	Pipelines and freight rail transport millions of gallons of crude oil across the country every day. Since 2000, there have been at least 734 pipeline spills of 1,000 gallons or more. Texas has a higher rate of oil and gas pipeline spills than the national average commonly due to equipment failure, natural disasters, aging pipelines, climate change, and operator error. The probability of a pipeline spill depends on the type and size of pipeline. Texas has 488,564 miles of continuously monitored oil pipelines that safely deliver oil and gas without incident over 99.999% of the time. In 2022, pipeline incidents resulted in 10 fatalities, 24 reported injuries, and $800 million in property damages. However, no incidents have been reported within the participating jurisdictions.
VULNERABILITY / IMPACT	Brownwood and Bangs are vulnerable to direct impacts of a gas transmission pipeline spill or release. Brown County and certain unincorporated areas are vulnerable to direct impacts of a hazardous liquid pipeline spill or release. Existing plans for future pipeline construction and operation increase the vulnerability of the participating jurisdictions to a pipeline incident.
PROPOSED PIPELINE CONSTRUCTION	The De La Express filed a request to initiate pre-filing with the Federal Energy Regulatory Commission (FERC) in 2024 to construct a 645-mile, 42-inch-diameter mainline, interstate long-haul pipeline project that will transport approximately 2 billion cubic feet per day of liquids-rich natural gas from the Delaware production basin in West Texas to demand markets in and around Lake Charles, Louisiana. Brown County is expected to have a compressor station located near the southeast county border with approximately 92,000 horsepower. Public hearings were held in Brownwood in June 2024 to allow the public to express concerns, ask questions, and offer opinions. The proposed schedule includes construction of the pipeline beginning in 2026 with full operations beginning in 2028.

FIGURE 6-38. *Houston Pipeline Explosion, 2024-09-16 (TIME Magazine)*

FIGURE 6-39. *Existing Pipelines, Brown County*[58]



[58] https://pvnpms.phmsa.dot.gov/PublicViewer/

FIGURE 6-40. *Proposed De La Express Project Pipeline Route and Facilities, Security Level: Public*[59]

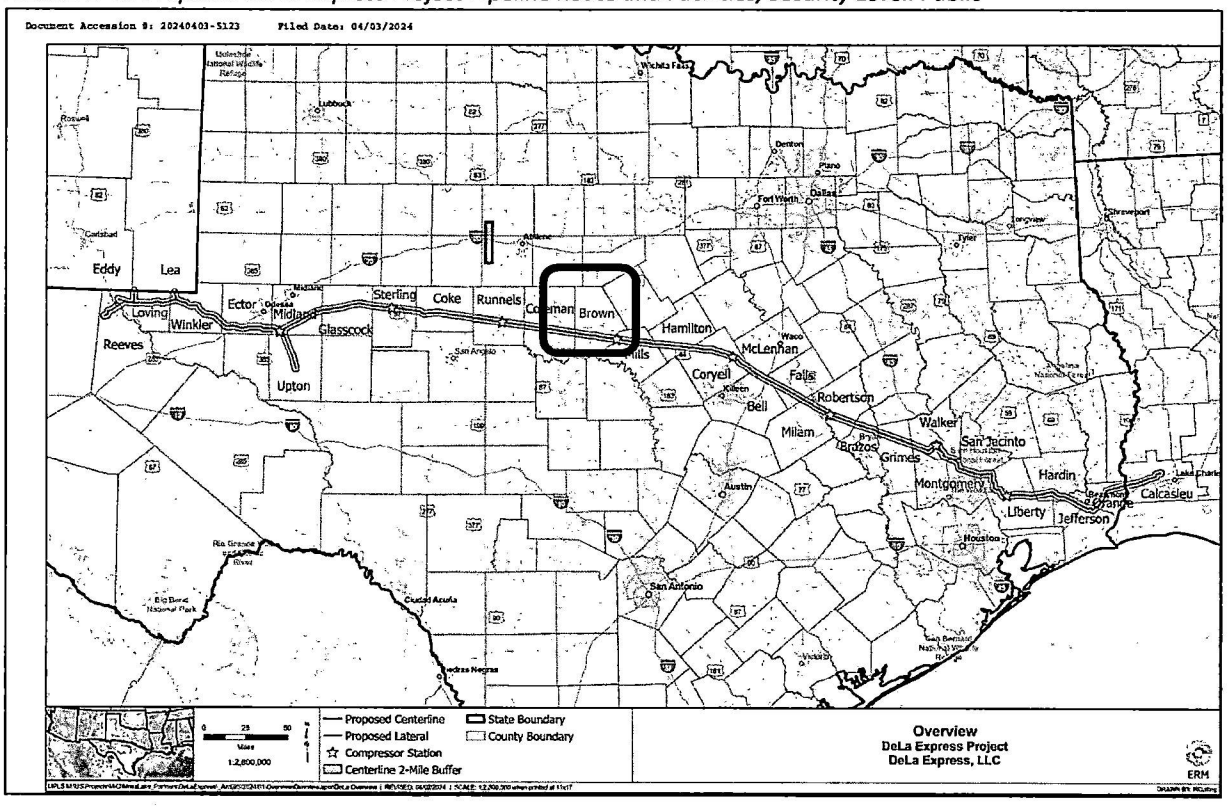


FIGURE 6-41. *Proposed De La Express Project Pipeline Route, Brownwood, Security Level: Public*[60]

[59] https://www.ferc.gov/projects

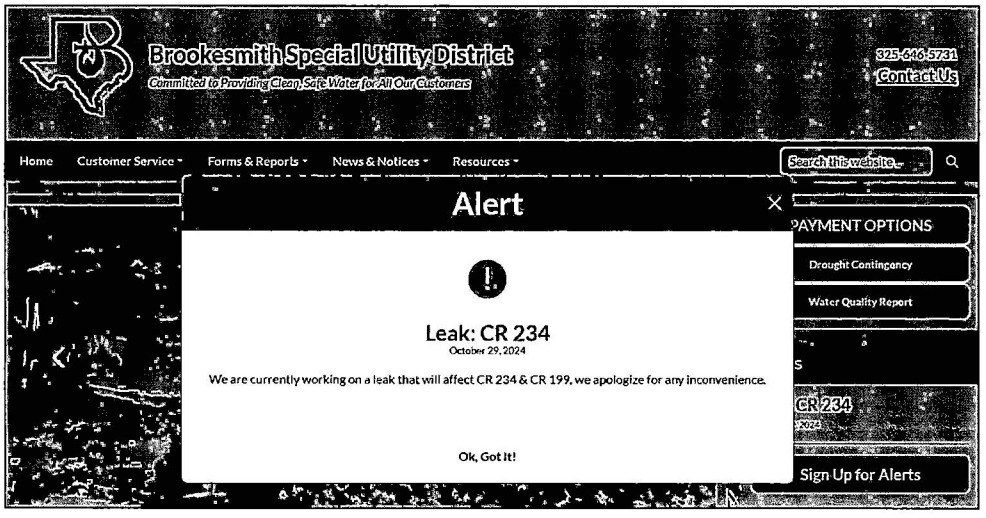
[60] https://www.brownwoodnews.com/2024/06/27/informational-meeting-held-for-proposed-pipeline-through-brown-county/

WATER MAIN BREAK

LIMITED IMPACT

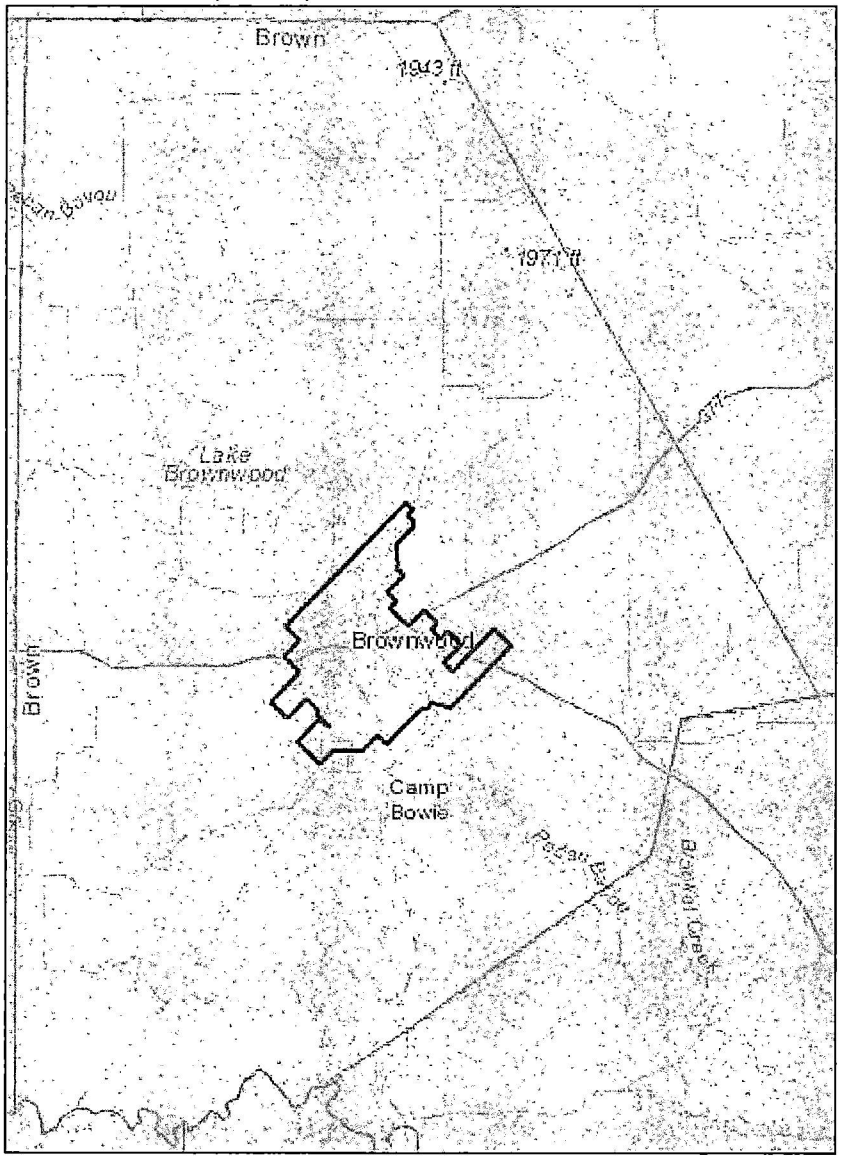
LOCATION	Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early.
EXTENT	The extent of a water main break depends on the size of the pipe, the location of the break, and the accessibility of the break. It can range from thousands to millions of gallons of water: • ¾-inch service line leak: 15,000 gallons • 6-inch main break: 30,000 – 156,000 gallons • 8-inch main break: 35,000 – 252,000 gallons • 12-inch main break: 45,000 – 378,000 gallons • 16-inch main break: 52,000 – 1,125,000 gallons
HISTORICAL OCCURRENCES	Water line leaks occur relatively frequently; however, major water main breaks are less frequent. Specific data on historical occurrences was unavailable but the risk assessment findings show water main breaks remain a significant hazard to all participating jurisdictions.
PROBABILITY	Water main breaks are estimated to occur every two minutes within the United States and can be caused by several factors, including: • Corrosion (pipes can corrode inside and out) • Frozen Ground (when water freezes, it expands and pushes on the surrounding ground, which can move nearby pipes) • Age (pipes are more likely to break after 60 years) • Pipe Diameter (smaller pipes are more likely to break than larger pipes) • Soil Erosion (construction, excavation, or previous pipeline breaks can erode the soil around water mains)
VULNERABILITY / IMPACT	The City of Brownwood has a program to detect and repair leaks that include monthly water audits to compare water purchased and sold; leak detection equipment to investigate abnormalities; quick replacement of leaky water lines; Supervisory Control and Data Acquisition (SCADA) system to monitor elevated tanks for water main breaks and other abnormalities; visual inspections by utility staff and meter readers; public education; and daily pH testing of raw and treated water. A water main break can cause significant impacts to communities, including structural damage to roads, buildings, and foundations; waterborne illnesses; traffic disruption, expensive repairs, and economic impacts to businesses. Water main breaks are common due to the complexity of water distribution systems.

FIGURE 6-42. *Utility Alert, October 29, 2024*[61]



[61] https://brookesmithwater.com/

FIGURE 6-43. *Municipal Utility Districts*[62]



Brown County Water Improvement District (WID)

Water system permanently sells to:
Brownwood
Brookesmith Special Utility District (SUD)
Coleman County SUD
Santa Anna
Bangs
Early
Zephyr Water Supply Corporation (WSC)

Water system sells emergency supplies to:
Blanket

Water Intake:
Lake Brownwood
Pecan Bayou

TCEQ District (green area of map):
Abilene

Functions:
Drainage
Eminent Domain
Flood Control
Hydroelectric
Irrigation
Special Law
Navigation
Recreation and Parks
Road Powers
Street Lighting
Supply Treated or Retail Water
Supply Raw (untreated) or Wholesale Water
Tax Bond Authority

[62] https://tceq.maps.arcgis.com/apps/webappviewer/index.html?id=04bbf8b322b34d8abaea7b06996d3775

Human Caused Hazards

ACTIVE SHOOTER / ACTIVE ATTACK

SIGNIFICANT IMPACT

LOCATION	Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early. Not confined to any geographical location or jurisdiction.
EXTENT	An active shooter or active attack incident is defined as any event that includes one or more active aggressor or active shooter actively engaged in killing or attempting to kill people in a populated area. In the U.S., the most prominent attack method used to perpetrate targeted violence is with a firearm. Active shooters, on average, have significant time to cause substantial and tragic consequences before law enforcement arrives. The length of time the incident lasts before the attacker is subdued, the type and number of weapons the attacker uses, the number and demographics of people in the area, the level of individual and community preparedness, and the capabilities and limitations of the responding law enforcement impact the extent of an active shooter/active attack event.
HISTORICAL OCCURRENCES	No documented historical occurrences of an active shooter/active attack available.
PROBABILITY	Due to the prevalence and frequency of active shooter/active attack incidents across the state and nation, the possibility of an event occurring within the participating jurisdictions is high; however, the statistical probability is much lower. The lower probability, or likelihood, does not alter the level of preparedness communities must strive for to mitigate this hazard because an incident may occur at any time in any place. Texas was ranked the second highest in the nation in 2023 for active shooters.
VULNERABILITY / IMPACT	Active shooter/active attack incidents can have a wide range of impacts, including: ✓ Fatalities and Injuries: active shooter incidents can result in fatalities, serious injuries, and prolonged trauma. ✓ Emotional Devastation: active shooter incidents can emotionally devastate affected communities. ✓ Economic Impacts: active shooter incidents can impact the economic outcomes of people affected by the event, especially children/students, who may be less likely to be employed and lose income. ✓ Psychological Impacts: active shooter incidents can impact the psychological well-being of victims, family, friends, students, faculty, and staff. ✓ Organizational Impacts: organizations that experience active shooter incidents can face medical and funeral bills, workers' compensation claims, on-site counseling services, business interruptions, regulatory penalties, and potential lawsuits. ✓ Community Impacts: active shooter incidents can undermine public confidence in schools, businesses, organizations, government leaders, and first responders. ✓ Location Impacts: active shooter incidents can leave lasting impacts on the locations in which they occur. Training and exercising response activities, cross-organizational coordination, and multi-agency/multi-jurisdictional collaboration occur at regular intervals to reduce community vulnerability to active shooter/active attack incidents; however, all participating jurisdictions recognize the importance of continuing and improving training plans to minimize vulnerability and community impacts. Cybersecurity and Infrastructure Agency (CISA) states that in many cases, there is no pattern or method to the selection of victims and these situations are by their very nature unpredictable and evolve quickly. Because active shooter events are often over within 10-15 minutes (before law enforcement arrives on the scene), individuals must be prepared both mentally and physically to deal with an active shooter situation. Therefore, participating jurisdictions minimize vulnerability through a whole-community approach that seeks to strengthen preparedness within schools, houses of worship, businesses, critical infrastructure partners, government personnel, and first responders. Recent active shooter incidents underscore the need to maximize preparedness and highlight the value of a coordinated response to save lives and mitigate the harmful impacts of such incidents (CISA).

FIGURE 6-44. *Active Shooter Incidents by State, 2023, FBI 2023 Active Shooter Report*

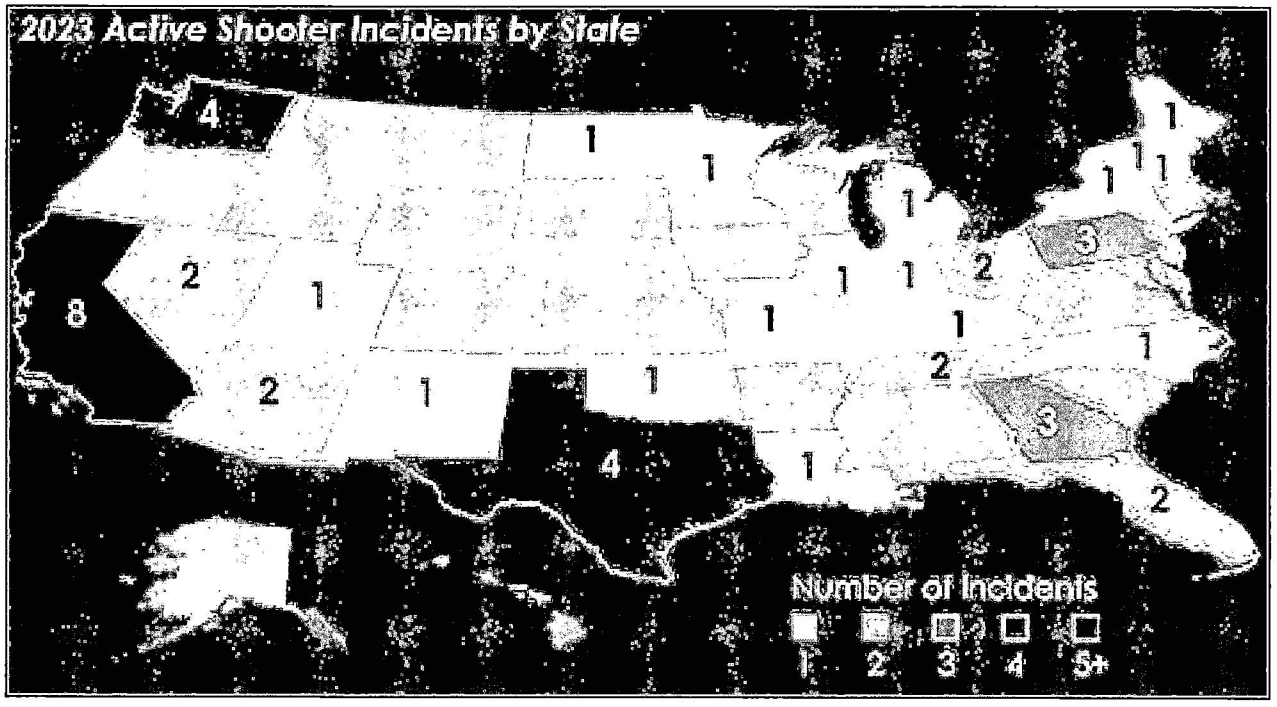


FIGURE 6-45. *Active Shooter Incidents by Casualties in the US, 2000-2023, FBI 2023 Active Shooter Report*

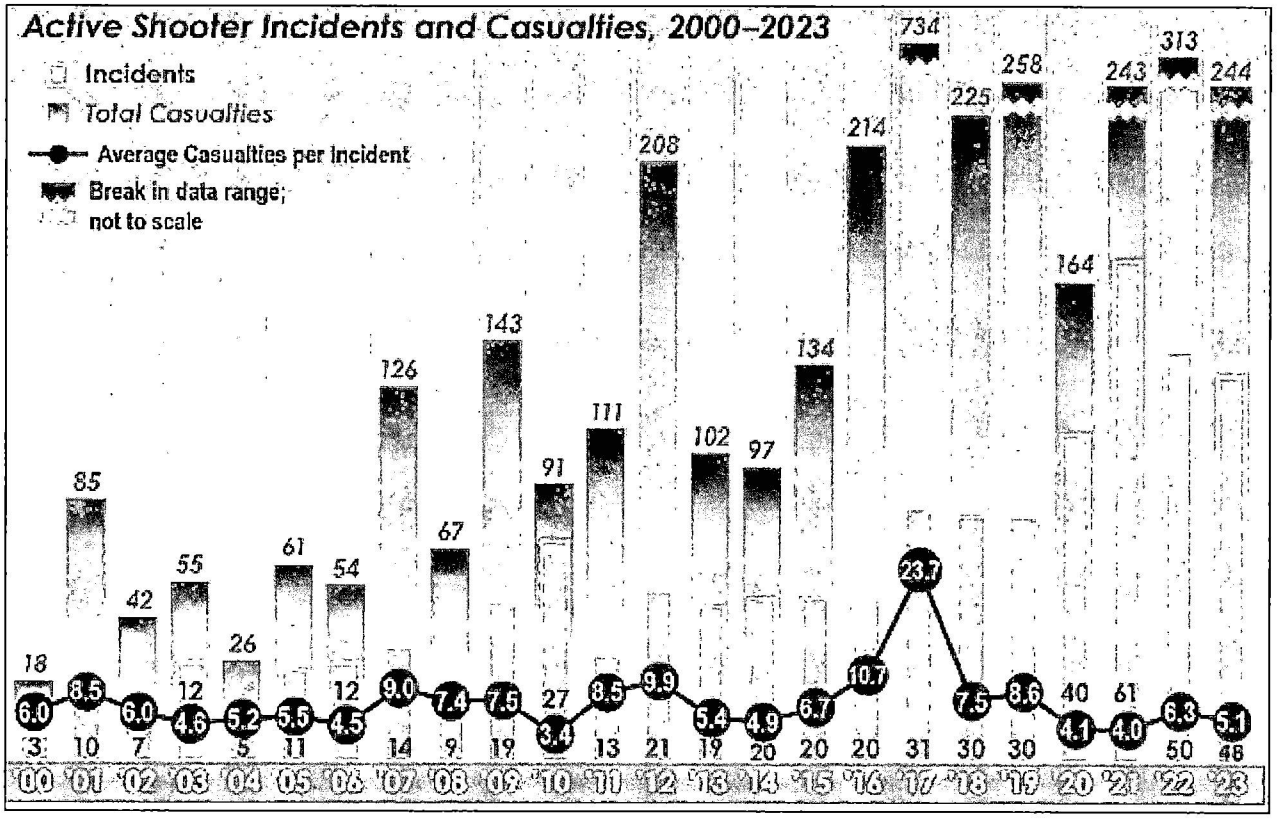


FIGURE 6-46. *Active Shooter Incidents/Casualties by Location in the US, 2019 - 2023, FBI 2023 Active Shooter Report*

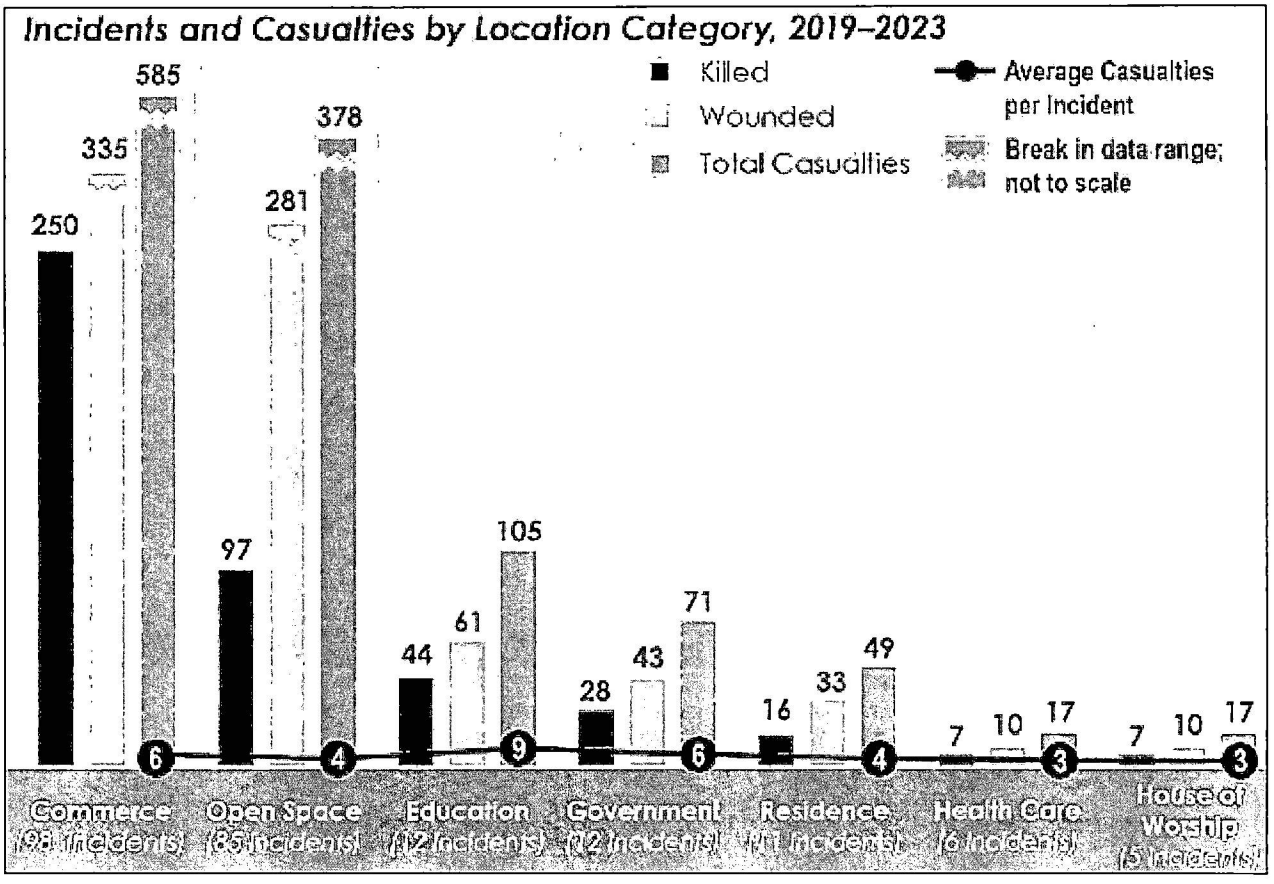
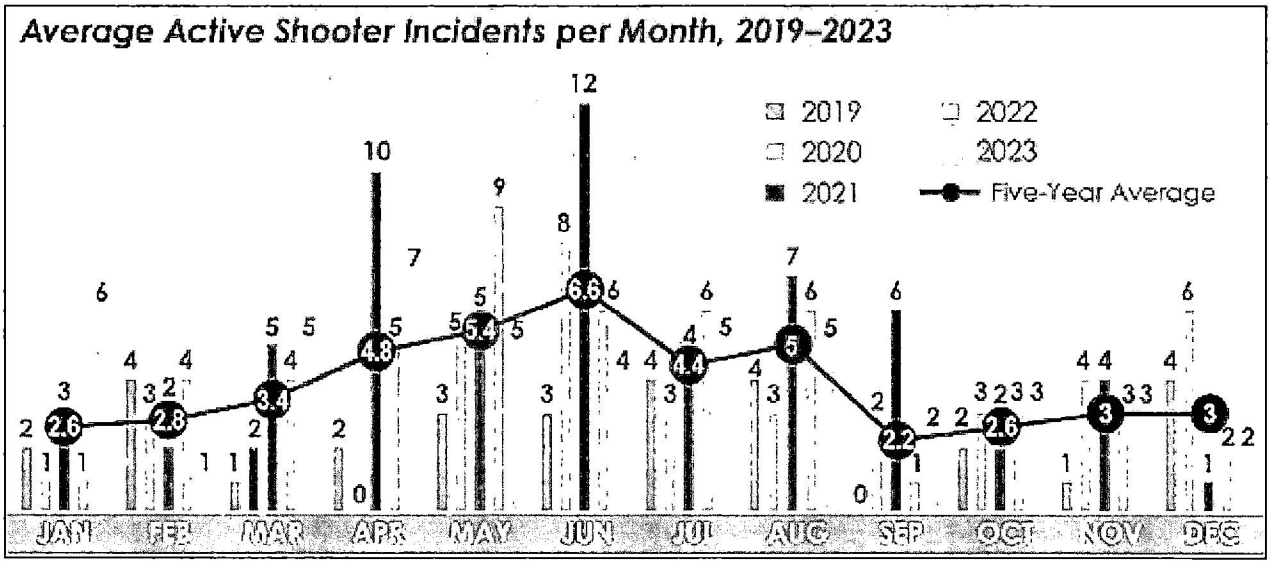


FIGURE 6-47. *Average Active Shooter Incidents per Month in the US, 2019-2023, FBI 2023 Active Shooter Report*



CYBERATTACK

SIGNIFICANT IMPACT

LOCATION	Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early. Not confined to any geographical location or jurisdiction.
EXTENT	According to CISA, a cyberattack is an intentional attempt to gain unauthorized access to an information system's resources, services, or information. It can also refer to an attempt to compromise the system's integrity. Cyberattacks can be carried out by a variety of means, including hacking, bombing, cutting, and infecting through malware, phishing, and ransomware. Cyberattacks can target a variety of devices, including computers, mobile phones/tablets, gaming systems, and networks causing several consequences, such as: fraud or identity theft; blocked access or deleted information; and problems with government/business services, transportation, and power.
HISTORICAL OCCURRENCES	March 2021 – alleged suspect hacked into cable system and issued false emergency alerts to evacuate (Brown County, Brownwood) October 2024 – alleged data breach of Brownwood-based insurance servicer affecting nearly 68,000 Texans and over 800,000 people nation-wide. January 2024 – Panhandle small town water systems hacked causing overflow following approximately 37,000 attempts in four days to log into the city firewall. November 2019 – small Texas ISD victim of $2.3 million Business Email Compromise (BEC) scam with 3 separate fraudulent transactions. October 2020 – data breach of local health system affecting personally identifiable information of patients.
PROBABILITY	March 2024 – federal government issues warning that cyberattacks against city governments, water systems, and school districts have increased substantially. Numerous attacks have occurred across Texas with heightened focus on small towns in rural regions of the state.
VULNERABILITY / IMPACT	Any kind of malicious activity that attempts to collect, disrupt, deny, degrade, or destroy information system resources or the information itself can result in significant impacts to operations. Participating jurisdictions currently invest in various forms of cybersecurity, the art of protecting networks, devices, and data from unauthorized access or criminal use. CISA publishes cybersecurity alerts and advisories frequently to share newly identified vulnerabilities, details on cyber incidents, and additional guidance to support mitigation activities across all industry sectors, both public and private. Organizations are at risk of criminal and civil liability charges for fraud and internal control failures when cybersecurity risks and vulnerabilities are knowingly neglected.
VULNERABILITIES CATALOG / INFORMATION SHARING	CISA maintains the authoritative source of vulnerabilities that have been exploited around the world. This database provides the participating jurisdictions with access to current threats, improvements for vulnerability management, and a prioritization framework. Utilizing this database benefits the participating jurisdictions in securing and defending critical infrastructure networks through awareness and up to date reporting mechanisms. Information sharing is the key to preventing widespread cyberattacks. The participating jurisdictions and regional partners have developed relationships with CISA for training, information sharing, and technical support and guidance.

FIGURE 6-48. *Current Cyberattacks, NetScout, 2024-11-05, 1348, https://horizon.netscout.com/?kiosk=true&mapPosition=0.00~0.00~1.00*

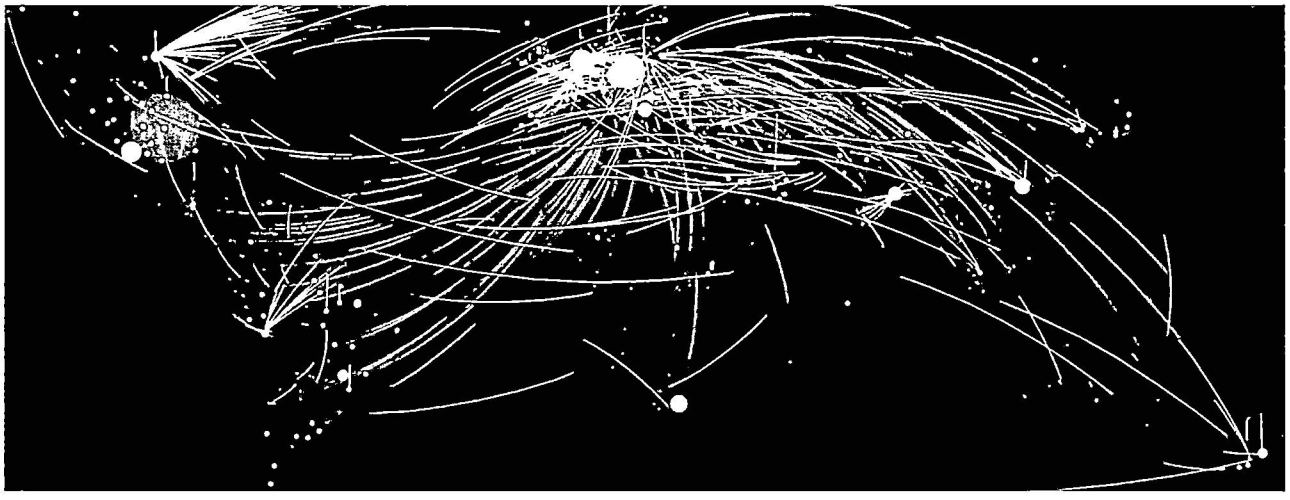
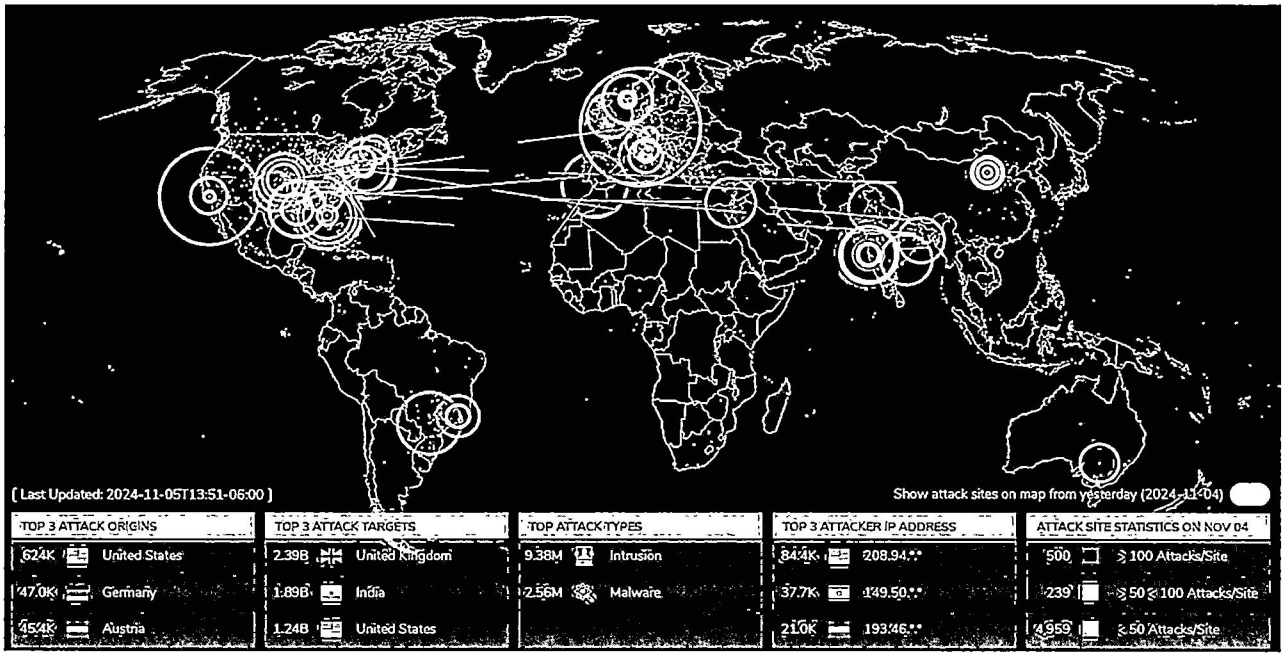


FIGURE 6-49. *Current Cyberattacks, SonicWall, 2024-11-05, 1352, https://securitycenter.sonicwall.com/m/page/worldwide-attacks*

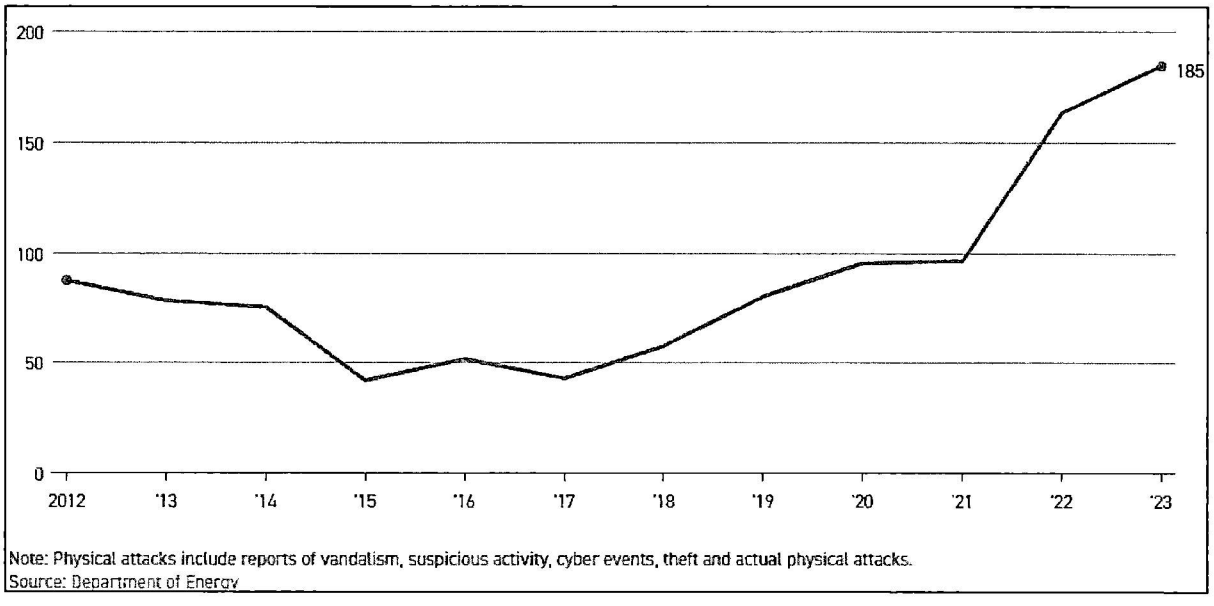


POWER GRID ATTACK

SIGNIFICANT IMPACT

LOCATION	Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early. Not confined to any specific geographical area. May impact all participating jurisdictions.
EXTENT	The US power grid consists of 3 mostly interconnected transmission grids that cover the contiguous US, as well as parts of Canada and Mexico. This includes the Texas electric grid that covers much of Texas (operates independently of other grids). The grid is vulnerable to attack at multiple points, including the transmission system, distribution systems, and step-up transformers.
HISTORICAL OCCURRENCES	The power grid in the US has been under increasing attack, both physically and cybernetically, in recent years. In 2022, there were more than 2,800 reported physical security threats to the power grid, including vandalism, gunfire, and other strikes. There were 164 reported attacks in 2022 and 185 reported attacks in 2023 to the Department of Energy Office of Intelligence and Counterintelligence. This was a rise from the previous year. ERCOT reports that the Texas Electric Grid has been attacked by state-sponsored hackers on multiple occasions within the previous 5 years. Specific reports and details on historical occurrences of physical and cyber-attacks on the Texas Electric Grid were unavailable; however, the threat remains current and credible.
PROBABILITY	In 2022, there was also a 77% increase in physical attacks on the grid, including attacks on substations. The energy sector was the fourth most cyberattacked industry in 2022. See the below figure for reported attacks on the power grid nationally and the power failure hazard profile for electric distribution by region in Brown County.
VULNERABILITY / IMPACT	The US electric grid is vulnerable to cyberattacks because of the growing use of remote access and connections to business networks (approximately 60 additional threats and identified vulnerabilities per day nationally). The US electric grid is increasingly vulnerable to physical attacks due to the enhanced sharing of information, including the locations of vulnerable assets and choke points that could have significant sustained consequences for the system. Recent incidents have not resulted in cascading outages or widespread failures (approximately 3% directly impact utility operations and distribution). Sustained power outages can have many effects on health and safety, healthcare services, commerce, communications, emergency services, water supply, food, construction, transportation, government operations, education, information technology systems, and increased electricity/utility prices. Additional psychological impacts may exist that would not be prevalent during a standard power outage due to the actions of the perpetrator (i.e. terroristic actions and events often lead to public fear and distrust not otherwise present).

FIGURE 6-50. *Physical and Cyber Attacks or Threats Against the US Electric Grid, Department of Energy*



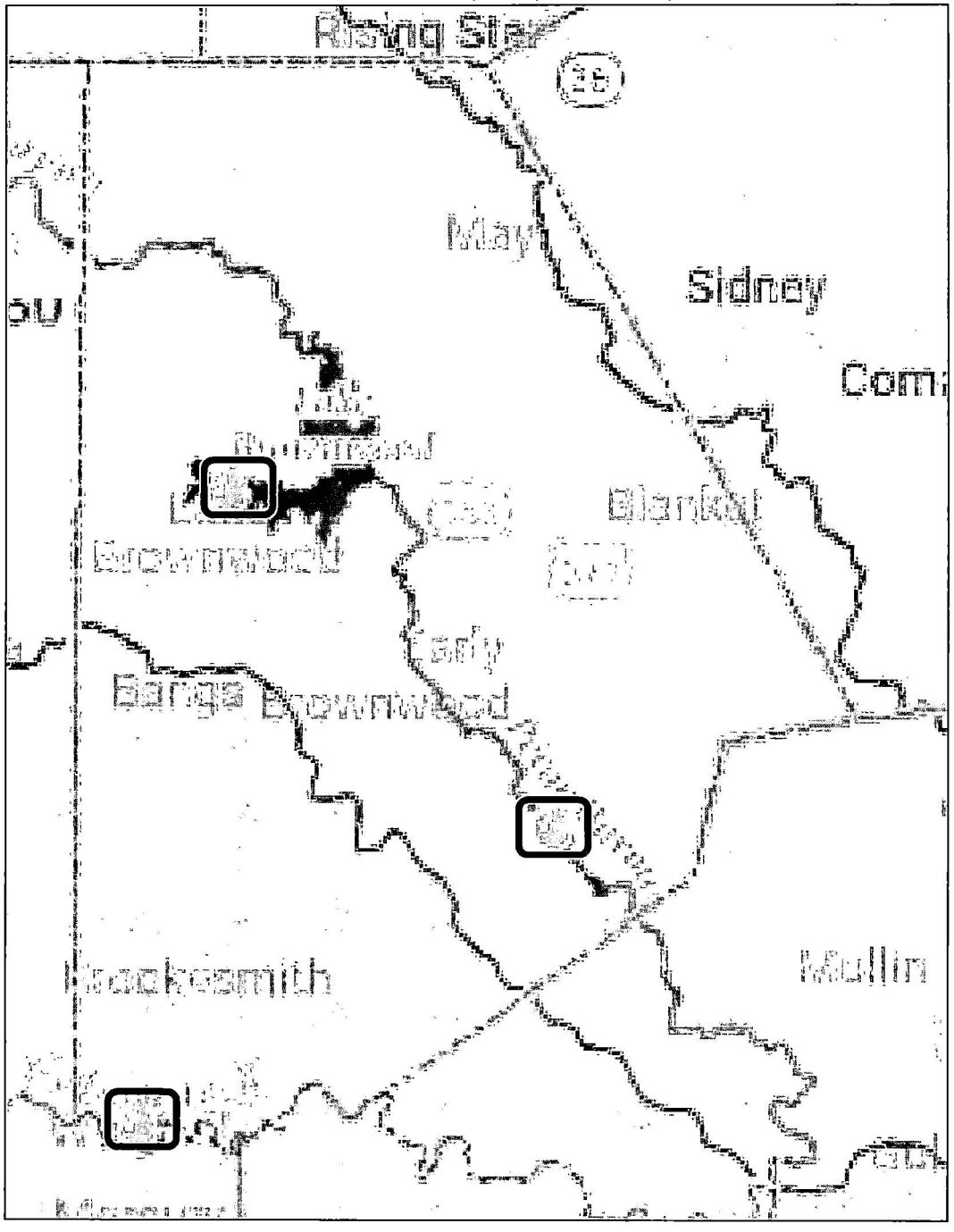
Note: Physical attacks include reports of vandalism, suspicious activity, cyber events, theft and actual physical attacks.
Source: Department of Energy

WATER SUPPLY CONTAMINATION (INTENTIONAL)

MODERATE IMPACT

LOCATION	Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early. Not confined to any geographical location or jurisdiction.
EXTENT	According to the Environmental Protection Agency (EPA), surface waters and aquifers can be contaminated by various chemicals, microbes, and radionuclides. Disinfection of drinking water has dramatically reduced the prevalence of waterborne diseases (i.e. typhoid, cholera, hepatitis) in the US. Other processes may also be used to treat drinking water depending on the characteristics of and contaminants in the source water. Common sources of drinking water contaminants include industry and agriculture (organic solvents, petroleum products, heavy metals, pesticides, fertilizers), human and animal waste (harmful microbes from sewage and septic systems, waste from animal feedlots and wildlife), treatment and distribution (byproducts of water treatment, breach in piping system, corrosion of plumbing materials), and natural sources (unsuitable groundwater with high levels of contaminants such as arsenic, heavy metals, or radionuclides). Intentional water supply contamination is a potential public health threat that can have serious medical, economic, and public health consequences. It can be carried out using biological, chemical, or radiological agents. Some examples of intentional water supply contamination include terrorist activity (water supplies are a potential target for terrorist activity because of the critical need for water in industrial societies, disruption of daily life, fear, and potential casualty count), military attacks (though unlikely in the US, opposing military forces have used deliberate contamination of water supplies as a method of attack throughout the world and history), or industrial negligence (organizations that discharge harmful contaminants in water supplies). Intentional contamination of drinking water falls into four categories: 1) Inorganic, such as metals or cyanide 2) Organic, such as pesticides or volatile compounds 3) Radionuclides 4) Pathogenic microbiological organisms
HISTORICAL OCCURRENCES	EPA's Report on Environment (ROE) found 91.7% of the population within EPA Region 6 (AR, LA, NM, OK, TX) was served by community water systems with no reported violations of EPA health-based standards.
PROBABILITY	Texas communities face several threats to its water quality, including intentional contamination. The probability within the participating jurisdictions is relatively low; however, 4 out of the 6 participating jurisdictions, including all 4 towns/cities, ranked intentional water supply contamination as a top 3 human caused hazard which elevated the priority for addressing this perceived risk.
VULNERABILITY / IMPACT	Chemical exposure through drinking water can lead to a variety of short- and long-term health effects. Exposure to high doses of chemicals can lead to skin discoloration or more severe problems such as nervous system or organ damage and developmental or reproductive effects. Exposure to lower doses over long periods of time can lead to chronic, longer-term conditions such as cancer. The effects of some drinking water contaminants are not yet well understood. Most life-threatening waterborne diseases caused by microbes are rare in the US. The more common illnesses caused by viruses, bacteria, and parasites can result in significant public health issue, especially within vulnerable populations or those with weakened immune systems. Some tests that can be used to detect water contamination include coliform bacteria (indicates whether microbial contamination has been introduced in the water system), heterotrophic plate count (provides the number of bacteria that may have introduced in the water), and chlorine residual (indicates whether materials introduced into the water have created a demand for chlorine). To protect public health, public water systems and districts within the county have established reporting protocols and relationships with local law enforcement. The impact of water supply contamination can be lessened through effective preparedness and mitigation measures, specifically, participating jurisdictions lessen their vulnerability by enhancing system protection, identification processes, and response capabilities.

FIGURE 6-51. *LCRA Colorado River Watch Network (CRWN) Water Quality Data*[63]



3 LCRA monitoring stations for testing water quality are located within Brown County:

Lake Brownwood at HWY 279	(Inactive Station)
Pecan Bayou at 10 Mile Crossing	(Inactive Station)
Colorado River at Winchell Bridge	(Inactive Station)

[63] https://crwn.lcra.org/

HAZMAT ATTACK

MODERATE IMPACT

LOCATION	Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early. Not confined to any specific geographic area.
EXTENT	The size and scope of the event is largely dependent on what, where, when, and how the hazardous material was released. The release of hazardous materials can have a wide range of impacts on people, the environment, and critical infrastructure including: • Health (skin or eye irritation to serious conditions like cancer, birth defects, reproductive impairment, and death) • Environment (soil and water contamination, death of plants and animals, and damage to ecosystem survivability capacity) • Property (damage to personal and business property, public sector property, and critical infrastructure) • Transportation (interfere with public or commercial transportation, supply chain, and emergency response access) • Evacuations (may require evacuation from homes and businesses causing additional economic and health concerns) • Fire and explosion (some hazardous materials are flammable or explosive resulting in additional safety concerns and further damage)
HISTORICAL OCCURRENCES	No specific data is available to provide a comprehensive listing of historical occurrences; however, fire departments within Brown County report HAZMAT incidents are common (often small events).
PROBABILITY	The probability of a HAZMAT release incident is highly likely within the next year; however, a large event with high numbers of casualties, property damage, or environmental damage is less likely to occur within the next year. As the types and amounts of HAZMAT are used and transported within and across the county, the probability of an event is likely to increase.
VULNERABILITY / IMPACT	The Brownwood Fire Department has obtained additional personnel and resources to respond to HAZMAT incidents and provides mutual aid support to all other participating jurisdictions. This improved response capability has decreased the county's vulnerability and potential impacts of a HAZMAT incident; however, to further reduce vulnerability, training and appropriate resource allocation should continue as a priority. Coordination of response resources and communication capabilities have been identified as current needs. Local hospital networks have HAZMAT response protocols, decontamination showers, and trained personnel. The post office distribution center maintains sensors to identify specific hazardous materials, stop operations, and implement immediate decontamination measures in coordination with public health and fire department. The public health department maintains a supply of prophylaxis medications for exposed post office personnel. The public health department and Department of State Health Services (DSHS) provide support with obtaining additional resources for medical response needs, including necessary prophylaxis and chemical packs from the Strategic National Stockpile (SNS) before, during, and after incidents. The TCEQ provides guidance and resources to local jurisdictions for HAZMAT spills and releases (intentional or accidental). Local, state, and federal law enforcement trains to respond to HAZMAT attacks.

WILDFIRE/ URBAN FIRE (MALICIOUS ARSON)

MODERATE IMPACT

LOCATION	Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early. Intentionally set wildfires and urban fires can occur within all participating jurisdictions.
EXTENT	The extent of a wildfire or urban fire would equal the potential magnitude of a naturally or accidentally set wildfire or urban fire. The malicious intent is the key aspect of planning and preparedness in this section.
HISTORICAL OCCURRENCES	Wildfires and urban fires in Brown County occur annually; however, there are no available records to indicate historical occurrences of wildfires or significant urban fires that were the result of arson. According to the National Interagency Fire Center, arson fires may account for over 20% of all human-caused wildland fires, and up to 70% or more fires in some jurisdictions. The actual number is unclear as arson fires may not be recognized as such and be classified as another cause, undetermined, or unknown for some time before a pattern develops. According to FEMA, arson is the leading cause of fires in the US (267,000 annually) and the second leading cause of deaths (475) and injuries. According to the US Forest Service and Department of Agriculture, wildland arson makes up the majority of fire starts in some parts of the US.
PROBABILITY	A wildfire or urban fire maliciously ignited affecting 1,000 people or more is highly unlikely. The economy is not likely to be significantly impacted by a fire in an urban area to the point that it meets the minimum threshold for emergency declarations; however, a wildfire may meet or exceed the minimum threshold. While an urban fire can affect habitat and species, the probability that the fire will destroy 10% of a habitat or kill 10% of a species is considered highly unlikely, but a wildfire would have greater impact on the habitat and species depending on the size and location.
VULNERABILITY / IMPACT	Urban fires are classified as uncontrolled burning in a residence or building with a potential for rapid spread to adjoining structures. Local fire departments are tasked with the response and control of urban fires. Certain areas within the participating jurisdiction are more vulnerable than others due to building construction, location, adjoining structures, unmaintained alleys and blocks, and population. Zoning, building codes, building materials, trained firefighters, specialized apparatus, and early detection technology have mitigated urban fires. Sustained mitigation efforts over the past century have reduced the risk of a significant urban fire but urban fires continue to kill people and destroy millions of dollars in property each year across the region and state. Urban fires will happen and sometimes result in tragic consequences, regardless of the cause: acts of negligence, chance occurrences, arsonists, terrorism, riots, warfare, or earthquakes (each with varying levels of relatively low risk within Brown County). The use of fire protection devices such as fire sprinklers and smoke detectors can greatly reduce the loss from a fire. Historically, most urban fires start in outside areas or vehicle areas; however, urban fires that start within functional areas within the structure often result in the highest property loss. Vulnerable populations without fire protection devices or physical disabilities that delay or obstruct evacuation are at the highest risk of injury or death. See also natural and technological hazard profiles for wildfires and urban fires for additional information related to risk, vulnerabilities, and impacts.

CIVIL UNREST

LIMITED IMPACT

LOCATION	Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early. Not confined to any specific geographic area.
EXTENT	Varies depending on the nature and scale of the unrest; can range from small, localized protests to widespread, large-scale disturbances.
HISTORICAL OCCURRENCES	No specific data is available to provide a comprehensive listing of historical occurrences; however, local authorities should remain vigilant and prepared to address any potential unrest, ensuring effective communication and coordination among law enforcement and community leaders to mitigate risks. Recent civil unrest events across the US include: • "Take Our Border Back" Convoy protest, January 2024 • APEC San Francisco protests, November 2023 • UNGA Climate Protests, September 2023 • Tennessee Gun Reform protests, March 2023 • Stop Cop City protests, January 2023 • Abortion Access protests, January 2023 • Abortion Ruling protests, May 2022 • Electoral protests, November 2020 • Police Brutality protests, May 2020 • Prison protest, April 2020 • Coronavirus protests, April 2020 • "Telegramgate" protests, July 2019 • "Lights for Liberty" protest, July 2019 • "Keep Families Together" protest, June 2018 • Immigration Ban protests, January 2017
PROBABILITY	Assessing the probability of civil unrest in Brown County, Texas, involves examining historical data, the current social and political climate, and other relevant factors. Historically, Brown County has not been a hotspot for significant civil unrest. However, the broader national context, including heightened political polarization and economic disparities, can influence local conditions. Given the current social and political climate in the United States, with increasing tensions and the potential for political violence around events such as elections, the likelihood of civil unrest in Brown County could be considered moderate.
VULNERABILITY / IMPACT	In Brown County, the vulnerability and impact of civil unrest can be significant, affecting various aspects of the community. Areas with higher population density, such as downtown Brownwood, may be more vulnerable due to the concentration of people and businesses. Economic disparities can exacerbate tensions, making economically disadvantaged areas more susceptible to unrest. Key infrastructure, including government buildings, law enforcement facilities, and utilities, are potential targets during civil unrest. Communities with higher levels of social vulnerability, including those with lower income, limited access to resources, and higher minority populations, may face greater impacts. Additionally, strain on public services such as police, fire, and medical services can increase vulnerability during periods of unrest. Public safety is a major concern, as civil unrest can lead to injuries or fatalities among both protesters and law enforcement personnel. Businesses, homes, and public properties may suffer damage from vandalism, looting, or arson. Prolonged unrest can disrupt local economies, leading to business closures, loss of income, and increased unemployment. Civil unrest can also heighten tensions within the community, leading to long-term social and political divisions. Furthermore, the capacity of emergency services to respond to other incidents may be compromised during periods of civil unrest. The impacts of civil unrest can be severe; however, the overall impact of civil unrest for the participating jurisdictions has been determined to be limited due to the lack of historical occurrences and relatively low likelihood of future events.

SECTION 7: MITIGATION STRATEGY

44 CFR REQUIREMENT
Requirement 44 CFR § 201.6(c)(3)(ii) The plan includes goals to reduce/avoid long-term vulnerabilities to the identified hazards.
Requirement HHPD The plan includes mitigation goals to reduce long-term vulnerabilities from HHPDs.
Requirement HHPD The plan addresses how to reduce vulnerabilities to and from HHPDs as part of its own goals or with other long-term strategies.
Requirement HHPD The plan includes actions that address HHPDs and prioritizes mitigation actions to reduce vulnerabilities from HHPDs.

Goals and Objectives

The goals and objectives of the HMAP represent the long-term vision of the participating jurisdictions to work independently and collaboratively to guide strategies and actions in reducing the impact of hazards.

TABLE 7-1. *Mitigation Goals and Objectives*

GOAL 1	PROTECT PUBLIC HEALTH AND SAFETY
Objective 1.1	Identify and reduce the health and safety impacts of hazards on vulnerable populations.
Objective 1.2	Improve and promote systems that provide early warning communications during and prior to an emergency.
Objective 1.3	Strengthen the enforcement of applicable state and local building and health codes and support other structural interventions to reduce vulnerability.
Objective 1.4	Develop strategies to reduce public health risk to natural and non-natural hazards.
Objective 1.5	Improve community engagement and outreach by organizations and agencies that provide services to vulnerable populations.
GOAL 2	INVEST IN PROPERTY PROTECTION
Objective 2.1	Implement mitigation programs that promote reliability of lifeline systems to minimize impacts from hazards and expedite recovery in an emergency.
Objective 2.2	Consider known hazards when identifying sites for new facilities, substantial retrofits, and utility systems.
Objective 2.3	Improve/create redundancies for critical networks such as water, transportation, energy, sewer, digital, data and power, and communications.
Objective 2.4	Adopt and enforce public policies to promote resilient development and enhance safe construction in high hazard areas.
Objective 2.5	Integrate new hazard and risk information into building codes and land use planning mechanisms.
Objective 2.6	Educate public officials, developers, realtors, contractors, building owners, and the public about hazard risks and building requirements.
Objective 2.7	Promote appropriate mitigation of all public and privately-owned property including but not limited to, residential units, commercial structures, educational institutions, healthcare facilities, and infrastructure systems.
Objective 2.8	Incorporate effective mitigation strategies into capital improvement projects, including critical infrastructure and high hazard potential dams (HHPD) to reduce vulnerabilities across communities.
Objective 2.9	Promote post-disaster mitigation as part of recovery activities.
GOAL 3	FOSTER AN ECONOMY THAT PROMOTES MITIGATION
Objective 3.1	Form partnerships to leverage and share resources.
Objective 3.2	Develop feasible plans that restore critical business operations post disaster.
Objective 3.3	Partner with private sector, including small businesses, to promote structural and non-structural hazard mitigation as part of standard business practices.
Objective 3.4	Educate businesses about contingency planning.
Objective 3.5	Partner with private sector to promote employee and employer education about disaster preparedness at work and at home.
GOAL 4	PROMOTE PUBLIC AWARENESS OF HAZARD RISK AND MITIGATION
Objective 4.1	Improve public outreach and access to hazard information, data, and maps to enhance understanding of natural, technological, and human caused hazards and the associated risks.
Objective 4.2	Improve the quality of information about hazards shared with the public.

Strategy Identification and Development

The mitigation strategy culminates in a synthesis of mitigation actions and the capability to advance them based on prioritization and implementation criteria. As the proposed projects require a range of timelines and resources, the mitigation strategy allows the participating jurisdictions to identify both short- and long-term approaches to implementation. The evaluation criteria were developed based on FEMA's Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLE+E).

Prioritization

44 CFR REQUIREMENT
Requirement 44 CFR § 201.6(c)(3)(iii) The plan contains an action plan that describes how the actions identified will be prioritized (including a cost-benefit review), implemented, and administered by each jurisdiction.
Requirement HHPD The plan describes the criteria used to prioritize actions related to HHPDs.

As part of the economic evaluation of the FEMA STAPLE+E criteria 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. Jurisdictions evaluated the impact of each action item and cross-examined it against benefits to vulnerable populations. 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. All mitigation action items created by the planning team are presented in this section in the form of action item 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. The term county-wide refers to Brown County and all participating jurisdictions.

TABLE 7-2. *Mitigation Action Categories*

CATEGORY	DESCRIPTION
Natural Resource Protection	Actions that involve the modification of existing natural resources to protect them from a hazard or to protect against them during a hazard event (floodplain protection, habitat preservation, slope stabilization, riparian buffers, forest management).
Emergency Services	Actions that protect people and property or increase the capacity of emergency response during and immediately following a disaster event (warning systems, evacuation planning, emergency response training and exercising).
Infrastructure Projects	Actions that involve the engineering of infrastructure systems (energy, telecom, water, transportation) to be more resistant to the impacts of hazards (dams, levees, detention/retention basins, channel modifications, retaining walls).
Prevention and Policy	Government, administrative, or regulatory actions and processes that influence the way land and buildings are developed and built (planning/zoning, building codes, open space preservation, floodplain regulations).
Property Protection	Actions that involve the modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area (acquisition, relocation, elevation, structural retrofits, storm shutters).
Public Education and Awareness	Actions to inform and educate citizens, elected officials, businesses, and property owners about the hazards they face and protective measures they can take to best prepare for or respond to hazards (outreach projects, school education programs, library materials, demonstration events, online/media/social media awareness campaigns).

Actions Addressing Existing and Future Development

The planning team discussed current building codes, zoning, and health codes and determined appropriate courses of action to address existing and future development within the confines of resident wants and needs, as shown through voting and public discussions. It was determined that certain mitigation strategies and actions would be presented to the public as deemed necessary; however, the county does not have, or expect to have, building and land codes approved by the public in the 5-year planning cycle of this HMAP.

Evaluation of Previous/Existing Mitigation Actions

44 CFR REQUIREMENT
Requirement 44 CFR § 201.6(d)(3) The plan was revised to reflect changes in priorities and progress in local mitigation efforts.
Requirement 44 CFR § 201.6(d)(3) The plan includes a status update for all mitigation actions identified in the previous mitigation plan.

The status of all action items addressed within the previous HMAP was evaluated to include recommendations for plan integration, future actions, and justifications for modification or discontinuance. Brookesmith ISD was not a participating jurisdiction in a previous HMAP.

The previous HMAP participating jurisdictions encountered multiple funding barriers to implement the previous mitigation strategy, actions, and/or projects. This was discussed and evaluated by the planning team to ensure more effective strategy development that incorporates meaningful, yet achievable, goals and objectives moving forward.

BROWN COUNTY

TABLE 7-3. *Previous Brown County Mitigation Action Items*

NO.	DESCRIPTION	STATUS	RECOMMEND	JUSTIFICATION
1	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.	Incomplete	Continue	All public awareness and education campaigns to be combined into one mitigation action item.
2	Obtain certification in the Nation Weather Service Storm Ready Program.	Complete	Discontinue	Application and certification in the National Weather Service Storm Ready Program requires a comprehensive all-hazard weather emergency plan within the EOP. Brown County is certified Storm Ready with NWS.
3	Adopt and implement a routine tree trimming program that clears tree limbs near power lines and/or hanging in right-of-way; Remove dead trees from right-of way and drainage systems on a scheduled basis.	Complete	Discontinue	Ongoing SOP/program by electric utilities company in collaboration with Brown County. No longer necessary within HMAP.
4	Incorporate higher standards for hazard resistance in local application of the building code.	Incomplete	Discontinue	No county specific building codes exist. Brown County follows state guidelines and county SOP. Adoption of higher standards than Texas requirements will not occur at this time.
5	Adopt and implement a program for clearing debris from bridges, drains, and culverts.	Incomplete	Discontinue	Action #3 and #5 are redundant in some respects. Combined and restructured into Storm Drainage System Maintenance Program already in place effectively.
6	Adopt higher floodplain standards.	Complete	Discontinue	Higher floodplain standards adopted. Action no longer applicable.
7	Upgrade undersized stormwater drains and culverts.	Incomplete	Continue	Action item in process; some undersized stormwater drains and culverts have been addressed through FEMA PA grant request.
8	Conduct public education program on fire risks and wildland fire mitigation, with the assistance of the Texas Forest Service.	Incomplete	Continue	Community Wildfire Protection Plan approved 09/2024; All public awareness and education campaigns to be combined into one mitigation action item.
9	Install fire danger rating/burn ban signs.	Complete	Discontinue	Completed through grant funding.
10	Require standards for burial of electrical, telephone, cable lines and other utilities in new developments.	Incomplete	Discontinue	No county standards have been established to date. Municipalities have completed portions of this action and may continue as necessary.
11	Install warning signs at hazardous bridges and roadways subject to ice.	Complete	Discontinue	Action has been completed and has become standard operating procedure for roadway maintenance and planning county-wide. Action is no longer necessary to remain within the HMAP.
12	Educate community on the dangers of low water crossings through the installation of warning signs and promotion of "Turn Around, Don't Drown" Program. Install barriers at low water crossings during heavy rain and flooding in support of "Turn Around Don't Drown."	Complete	Discontinue	All public awareness and education campaigns to be combined into one mitigation action item.
13	Implement a flood awareness program by providing FEMA/NFIP materials to the public, mortgage lenders, real estate agents and insurance agents and place them in local libraries.	Complete	Discontinue	All public awareness and education campaigns to be combined into one mitigation action item. Additional NFIP educational outreach and needs necessary for Brown County should be discussed by the planning teams.
14	Develop local agreements with landowners to cut fences for both access to wildfires, and to free trapped livestock. Include landowners who will be willing to take control and move livestock to safe areas for care and feeding.	Complete	Discontinue	Status of action varies across Brown County. Long standing agreements with landowners exists. Incorporate into the Community Wildfire Protection Plan.
15	COUNTY WIDE - Acquire and install generators with hard wired quick connections at all critical facilities.	Incomplete	Continue	Action item in process. Provided generators to water utilities using County ARPA funds.
16	COUNTY WIDE - Harden/retrofit critical facilities to hazard-resistant levels.	Incomplete	Continue	No county standards have been established to date. FEMA guidance to be considered by planners, but action incomplete due to lack of funding.
17	COUNTY WIDE - Adopt a landscape ordinance (selection and planning guidelines).	Incomplete	Discontinue	No county ordnance desired by residents.

TABLE 7-3, CONTINUED. *Previous Brown County Mitigation Action Items*

NO.	DESCRIPTION	STATUS	RECOMMEND	JUSTIFICATION
18	COUNTY WIDE - Complete an updated soil survey for the entire county.	Complete	Discontinue	Action no longer applicable. Survey data available through updated state records.
19	COUNTY WIDE - Undertake a comprehensive study of flood risk and reduction alternatives, with the assistance of the US Army Corps of Engineers. Adopt or revise flood damage prevention ordinance to include flood risk areas identified in the study. This study will cover all incorporated and unincorporated areas of the county that currently have limited studies with no determined base flood elevations as well as unmapped areas.	Incomplete	Discontinue	Currently underway at municipal level.
20	COUNTY WIDE - Upgrade critical facilities to include drought mitigation measures and expansive soils protection such as greywater reuse systems, drought tolerant landscaping, installation of a sprinkler system with regular watering schedule and installation of French drains where high plasticity soils are indicated.	Incomplete	Discontinue	Mitigation unattainable at this time county-wide; to be determined at municipal level.
21	COUNTY WIDE - Implement a residential safe room rebate program.	Incomplete	Modify	Combine residential and community safe room action items into one. Referring residents to WCTCOG to be added to waiting list for FEMA rebates when applicable. Continue while grant funding available.
22	COUNTY WIDE - Build community safe rooms throughout the jurisdictions.	Incomplete	Modify	Combine residential and community safe room action items into one. Currently, there are 2 grants in process for Community Saferooms.
23	COUNTY WIDE - Acquire and distribute NOAA weather radios. Purchase and install emergency warning sirens for communities during disasters.	Incomplete	Discontinue	In process, looking for Grant funding. Action will transition into public awareness and education campaign through Public Education/Awareness Program (EMC/PIO) due to lack of grant funding available to fund community-wide purchase of weather radios.

BANGS

TABLE 7-4. *Previous Bangs Mitigation Action Items*

NO.	DESCRIPTION	STATUS	RECOMMEND	JUSTIFICATION
1	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.	Incomplete	Continue	Include in the 2025 Plan Update
2	Acquire and distribute NOAA weather radios. Purchase and install emergency warning sirens for community during disasters.	Complete	Discontinue	Incorporated into City Emergency Operations Plan
3	Acquire and install generators with hard wired quick connections at all critical facilities.	Complete	Discontinue	Incorporated into City Continuity of Operations Plan
4	Adopt and implement a routine tree trimming program that clears tree limbs near power lines and/or hanging in right-of-way; Remove dead trees from right-of way and drainage systems on a scheduled basis.	Complete	Discontinue	Incorporated into City Ordinances/Building Codes. Utility companies also routinely perform this service to high lines, etc.
5	Upgrade undersized stormwater drains and culverts.	Complete	Discontinue	Done by City Public Works as needed, and by contractors as part of updating City water and sewer lines.
6	Equip sewer manholes with watertight covers and inflow guards.	Complete	Discontinue	Incorporated into City Water Policy.
7	Educate community on the dangers of low water crossings through the installation of warning signs and promotion of "Turn Around, Don't Drown" Program. Establish and implement a public awareness program regarding availability of flood insurance by disseminating brochures in public places, such as City Hall.	Incomplete	Modify	Incorporate into City Emergency Operations Plan.
8	Install fire danger rating/burn ban signs.	Complete	Discontinue	Incorporated into existing Fire Department Policy.

TABLE 7-4, CONTINUED. *Previous Bangs Mitigation Action Items*

NO.	DESCRIPTION	STATUS	RECOMMEND	JUSTIFICATION
9	Adopt and implement program to insulate outdoor pipes at public buildings.	Complete	Discontinue	Incorporated into existing City Public Works policy.
10	Add building insulation to walls and attics and wrap/insulate pipes at public facilities.	Complete	Discontinue	Incorporated into existing City Ordinances/Building Codes.
11	Retrofit community center to serve as an emergency shelter for the community and as a cooling station during extreme heat events.	Incomplete	Continue	Not completed. Discussions underway with Public Works and Police Departments for possible conversion during emergencies/disasters.
12	Adopt and implement routine fire hydrant maintenance plan. Upgrade hydrants and water lines to improve firefighting capabilities.	Complete	Discontinue	This activity is performed routinely by the Public Works Department.

BLANKET

TABLE 7-5. *Previous Blanket Mitigation Action Items*

NO.	DESCRIPTION	STATUS	RECOMMEND	JUSTIFICATION
1	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.	Complete	Discontinue	City of Blanket, TX. social media page on Facebook. Notices pertaining to public safety & awareness are posted on FB & at the City Hall. This allows the city to reach the community.
2	Acquire and install generators with hard wired quick connections at all critical facilities.	Incomplete	Continue	The wastewater plant has a hard-wired quick connection for the portable generator mounted on a trailer. The wells need to be hard-wired to connect a generator in case of power outage.
3	Obtain certification in the Nation Weather Service Storm Ready Program.	Incomplete	Modify	Community residents can sign up for Code Red Weather Alerts on their phones.
4	Implement and enhance an area-wide telephone Emergency Notification System ("Reverse 911").	Incomplete	Modify	Community residents can sign up for Code Red Emergency Alerts on their phones.
5	Adopt a landscape ordinance (selection and planning guidelines).	Incomplete	Discontinue	The city does not have a Landscape ordinance in place. No set planning requirements in place. If there is obstruction of view at intersections, residents are contacted to remedy the obstruction.
6	Install irrigation systems and adopt/implement watering schedule at public buildings and critical facilities.	Complete	Discontinue	No irrigation systems at public buildings. No watering at critical facilities.
7	Adopt and implement a program for clearing debris from bridges, drains, and culverts.	Incomplete	Continue	Ditches at low water crossings have been cleared of debris. Multiple culverts need to be replaced but the funds are not available.
8	Identify flood-prone and repetitive loss properties through the Texas Water Development Board. Identify and implement actions to reduce or eliminate flooding at identified properties.	Complete	Discontinue	Floodplain is identified through the NFIP designated maps. Low water crossings are kept clear of debris to help divert water flow.
9	Adopt higher floodplain standards.	Incomplete	Discontinue	New structures are not allowed in the floodplain unless they are built according to standard NFIP requirements
10	Undertake an initiative to increase the number of flood insurance policies.	Incomplete	Discontinue	Flood insurance policies are required on mortgages. However, the City has not promoted increased number of flood insurance policies.
11	Implement a flood awareness program by providing FEMA/NFIP materials to mortgage lenders, real estate agents and insurance agents and place them in local libraries. Disseminate flood insurance informational brochures with each new building permit.	Incomplete	Modify	Flood insurance informational brochures can be distributed with each new building permit.
12	Educate community on the dangers of low water crossings through the installation of warning signs and promotion of "Turn Around, Don't Drown" Program.	Complete	Discontinue	"Watch for Water" signs have been installed at the low water crossing.
13	Provide how-to information to residents for installing backflow valves to prevent reverse-flow floods.	Complete	Discontinue	Information is provided regarding cross-connections in the new customer packets.
14	Flood-proof sewage treatment plants in flood hazard/low-lying areas.	Complete	Discontinue	Flood-proof was implemented when sewage treatment plant was built in the flood/ low-lying areas.

TABLE 7-5, CONTINUED. *Previous Blanket Mitigation Action Items*

NO.	DESCRIPTION	STATUS	RECOMMEND	JUSTIFICATION
15	Conduct public education program on fire risks and wildland fire mitigation, with the assistance of the Texas Forest Service.	Complete	Discontinue	Blanket VFD conducts annual fire prevention awareness at school. The city supports the development of the Brown County Community Wildfire Protection Plan
16	Adopt and implement routine fire hydrant maintenance plan.	Incomplete	Modify	The city has 1 fire hydrant & 2 risers where trucks can fill.
17	Install a network of dry hydrants in stock ponds, creeks, and small lakes to increase the supply of water for fire protection.	Incomplete	Discontinue	No stock ponds or small lakes to be used for fire protection.
18	Allow no vegetation in easements or require fire resistant landscaping.	Complete	Discontinue	The City clears the City's right of ways & easements of any overgrowth of vegetation.
19	Install fire danger rating/burn ban signs.	Complete	Discontinue	Residents are instructed to contact Brown County non-emergency line to see if there is a Burn Ban in effect and report any controlled burning.
20	Implement a community education program regarding fire dangers for identified risk areas; Distribute pamphlets through neighborhood associations or insert flyers in water bills to make residents aware of wildfire hazard areas and fire protection measures for homes and yards.	Complete	Discontinue	The city distributes the pamphlets & flyers in the new customer packets & post on City's FB social media site when dangers arise.
21	Adopt an ordinance that will limit aerial extensions to water, sewer, gas, and electrical lines.	Incomplete	Discontinue	
22	Adopt and implement a routine tree trimming program that clears tree limbs near power lines and/or hanging in right-of-way; Remove dead trees from right-of way and drainage systems on a scheduled basis.	Complete	Discontinue	The city routinely trims trees from right-of-way. Oncor Electric Delivery is contacted when trees are tangled in power lines so a "safe cut" can be performed.
23	Require "safe rooms" to be added when constructing new schools, daycares, rest homes and critical care facilities.	Incomplete	Discontinue	Safe rooms are not required on new constructions of facilities.
24	Build safe room shelters at manufactured home parks so that all park residents can reach shelter in less than five minutes.	Incomplete	Discontinue	There is not a safe room shelter at the local RV park. Residents are instructed to go to the school gym or Church basement. Both are located within five minutes.
25	Adopt ordinance requiring tie-downs for mobile homes; Require manufactured housing be securely anchored to permanent foundations.	Complete	Discontinue	Ordinance regulating all mobile homes to be installed according to HUD
26	Implement program to cross-train Building Inspectors and Code Enforcement officer regarding NFIP Compliance regulations pertaining to permitting and inspections.	Incomplete	Discontinue	The City has investigated obtaining a code enforcement officer, but funds are not available to hire a code officer currently
27	Clear abandoned areas to prevent wildfires.	Complete	Discontinue	The city routinely mows overgrown weeds. Letters are sent to property owners of abandoned/vacant structures requesting the property owner to clear areas of debris & high weeds.
28	Adopt and implement the CodeRED community notification system for emergency notifications during extreme weather events.	Complete	Discontinue	Community residents can sign up for Code Red Weather Alerts on their phones.
29	Upgrade city owned water well.	Complete	Discontinue	A new well was drilled & constructed in May 2024, funded by TDA CDBG.

BROWNWOOD

TABLE 7-6. *Previous Brownwood Mitigation Action Items*

NO.	DESCRIPTION	STATUS	RECOMMEND	JUSTIFICATION
1	Erosion control - Construction practices that prevent erosion and sedimentation can reduce flood damages in flood-prone areas. Erosion control plans will be a requirement before construction can begin. Inspections will be conducted by City staff.	Complete	Discontinue	Planning and Development Department Responsibility through City Budget
2	Flood elevation certificates - Flood elevation certificates will be required before a certificate of occupancy is issued by the City.	Complete	Discontinue	Planning and Development Department Responsibility through City Budget

TABLE 7-6, CONTINUED. *Previous Brownwood Mitigation Action Items*

NO.	DESCRIPTION	STATUS	RECOMMEND	JUSTIFICATION
3	Cross-train building inspectors in floodplain management requirement -Additional assistance and cross-trained employees with floodplain management requirements.	Incomplete	Discontinue	The City Budget covers the expense of training personnel as necessary to ensure the NFIP program is maintained, and the Floodplain Administrator position remains fulfilled.
4	Educate public about extreme heat/drought safety and health issues - Educate public about extreme heat/drought safety and health issues via information and links on the City's website.	Complete	Modify	Public awareness and education campaigns are incorporated into the Emergency Operations Plan and additional Public Awareness Programs city-wide identified within the general operating budget. All-hazards awareness campaigns will continue throughout the year in multiple forms via different platforms.
5	Educate homeowners about water conservation and landscape planning practices to preserve water supplies - Educate homeowners about extreme heat/drought conservation landscaping measures through water bills and pamphlets.	Complete	Discontinue	All public awareness and education campaigns to be combined into one mitigation action item.
6	Promote water and energy conservation to government and the public - Both City employees and the public need to be reminded about water and energy conservation.	Complete	Discontinue	All public awareness and education campaigns to be combined into one mitigation action item.
7	Perform routine fire hydrant maintenance - Perform routine fire hydrant maintenance to ensure the safety of firefighters and the availability of water when needed.	Complete	Discontinue	Paid fire departments regulated by ISO to conduct routine fire hydrant maintenance. Action is redundant within Brownwood city limits. Applies to volunteer fire departments unregulated by ISO.
8	Remove downed trees that increase wildfire risk - Educate public about removing downed trees that increase wildfire risk.	Complete	Discontinue	Incorporated into wildfire protection and public awareness campaigns and programs.
9	Ensure City firefighters are properly trained - Training will be routinely offered to all firefighters.	Complete	Discontinue	Standard operating procedures and expectations of fire department and city. Training incorporated into emergency operations plan. Additional training to be assessed and requested as deemed necessary.
10	Adopt ordinance requiring fire extinguishers for all homes and businesses - Businesses (but not residences) are required to have fire extinguishers. Pass an ordinance that fire extinguishers be required in homes for when wildfires interface with homes.	Incomplete	Discontinue	Action no longer deemed appropriate.
11	Fire prevention education - Educate public about fire prevention measures.	Complete	Discontinue	All public awareness and education campaigns to be combined into one mitigation action item.
12	Track and record high-water marks following floods - Historic flood information is important to know when tracking flood events that have affected the city over time.	Complete	Discontinue	Conducted continuously within other programs; no longer necessary as mitigation item within HMAP.
14	Verify FEMA's repetitive loss inventory and maintain current loss data - Notify repetitive loss property owners of FEMA HMA funding availability. This action will also assist the city in maintaining participation in the NFIP.	Incomplete	Discontinue	Conducted continuously within other programs; no longer necessary as mitigation item within HMAP.
15	Maintenance program for clearing debris - Implement a maintenance program for clearing debris from bridges, stormwater drains and culverts. Maintain sewer manholes with watertight covers and inflow guards. Raise electrical components of sewage lift stations above base flood elevation. Flood proof sewage treatment plants in flood hazard and low-lying areas. Raise manhole openings using alternative methods.	Complete	Discontinue	Conducted continuously within other programs; no longer necessary as mitigation item within HMAP.
16	Adopt DFIRM - Preliminary maps issued by FEMA on December 21, 2012. Final DFIRM maps will be adopted in 2016.	Complete	Discontinue	Adopted within EOP; maps dated 2016.
17	Multi-hazard Public Awareness Program - Educate homeowners on how to mitigate their homes from all hazards through water bills and pamphlets.	Incomplete	Discontinue	All public awareness and education campaigns to be combined into one mitigation action item.
18	Construct stormwater detention/retention basins - Construct on-site retention basins in conjunction with development to address excessive stormwater.	Complete	Continue	Will be the responsibility of Public Works using City Budget

TABLE 7-6, CONTINUED. *Previous Brownwood Mitigation Action Items*

NO.	DESCRIPTION	STATUS	RECOMMEND	JUSTIFICATION
19	Retain natural vegetation in stormwater channels - Vegetation in stormwater channels allows rainfall to infiltrate the ground, reducing stormwater runoff.	Complete	Discontinue	Standard operating procedures for Public Works and Planning/Development Departments through the City Budget.
20	Develop mutual aid agreements - Develop mutual aid agreements with area governmental entities such as cities, the county, and State. Assistance may be needed with nearby communities after a natural disaster event.	Complete	Modify	Change *Develop* with *Update* Responsibility: Office of Emergency Management (City Budget)
21	Acquire, conserve, and utilize easements to prevent development of known hazard areas – The City will acquire, conserve, and utilize easements of known hazard areas of dams, levees, expansive soils, and floodplains. This can prevent future disaster events by keeping open spaces in known hazard areas.	Complete	Discontinue	Ongoing responsibility of Public Works and Planning/Development departments through effective Land Use Plans (ensure Land Use Plan is up to date).
22	Update International Building Code - Adopt the 2015 version of the International Building Code and the 2014 version of the National Electric Code. Stricter building codes goes to mitigate identified hazards such as tornado, high wind, earthquake and impact resistant materials (windows, doors, roof bracings); dry-proofing public buildings for flooding; upgrading to higher standard insulation for extreme heat and winter storms; installing lighting rods and grounding systems on public buildings; retrofitting to low-flow plumbing and replacing landscaping with drought and fire resistant plants; stricter codes for hail and fire resistant roofing and siding; implementing higher standards for foundations, and upgrading requirements for construction beams, brackets and foundations to mitigation impacts of earthquake and expansive soils.	Complete	Modify	Add code requirements for downtown district
23	Coordinate with local businesses and City/county offices for a post-disaster reconstruction plan - Coordinate with local businesses and city/county offices for a post-disaster reconstruction plan.	Incomplete	Discontinue	Action already incorporated into county EOP. Capability to coordinate with local businesses during response and recovery activities exists within city EOP.
24	Emergency management training - Send City staff to classes and workshops.	Complete	Discontinue	Ongoing training is justified through human resource policies, emergency operations plan, FEMA recommendations and funded through the city budget and grants. Action is no longer necessary in the HMAP as it is fully incorporated elsewhere.
25	SBA Loan Program - The U.S. Small Business Administration has established a five-year pilot program of low-interest, fixed-rate loans to small businesses. The loans are designed to help business owners implement hazard mitigation measures to protect their property from disasters. The city can send flyers with the water bill and have pamphlets available at City Hall.	Incomplete	Discontinue	SBA Loan Program no longer applicable.
26	Hazard Susceptibility Audits - The City can inspect businesses and advise owners to the potential hazards.	Complete	Discontinue	Available via the OEM
27	Construct Tornado Safe Rooms in community facilities - Construct Tornado Safe Rooms in public facilities per FEMA Construct Standards.	Incomplete	Modify	Will be the responsibility of Facility Maintenance using Grants
28	Vegetation mitigation - Periodic tree pruning around City right-of-way and electric power lines will significantly reduce wind damage to structures and reduce frequency and duration of power outages. Trimming brush, trees, and other vegetation in drainage ways will increase drainage capacity and help prevent flooding of structures. Trim trees and provide public service announcements regarding tree trimming.	Complete	Discontinue	Street Department conducts periodic tree pruning as part of the department's standard operating procedures under general operating budget.
29	Manufactured home mitigation - Require all manufactured homes to have the correct tie-downs to prevent them from wind uplift and becoming buoyant in floodwaters.	Complete	Discontinue	Change *All* with *New* Responsibility: Planning and Development (Funding: City Budget)

TABLE 7-6, CONTINUED. *Previous Brownwood Mitigation Action Items*

NO.	DESCRIPTION	STATUS	RECOMMEND	JUSTIFICATION
30	Drainage Capital Improvements - The City will establish a Capital Improvement Program Fund that will mitigate future flood damages.	Incomplete	Modify	Responsibility: Finance Department Funding: Updated Action: The City will establish a Capital Improvement Program Fund that may be used to mitigate future flood damages.
31	Willis Creek Detention - Construction of detention ponds along Willis Creek and South Willis Creek to reduce the risk of flooding.	Complete	Modify	Responsibility: Public Works Department Funding: Grant Updated Action: Consider construction of detention ponds along Willis Creek and South Willis Creek to reduce the risk of flooding.
32	Magnolia Ditch Project - The Magnolia Ditch Project will include construction of a ditch and installation of a new culvert that will reduce the risk of flooding to 400 residents that live in three apartment complexes and duplexes in this area.	Incomplete	Modify	Will be the responsibility of Public Works Department using Grant Funding.

EARLY

TABLE 7-7. *Previous Early Mitigation Action Items*

NO.	DESCRIPTION	STATUS	RECOMMEND	JUSTIFICATION
1	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.	Complete	Modify	All public awareness and education campaigns to be combined into one mitigation action item.
2	Obtain certification in the Nation Weather Service Storm Ready Program.	Complete	Discontinue	Action complete.
3	Implement and enhance an area-wide telephone Emergency Notification System ("Reverse 911").	Complete	Discontinue	Action complete.
4	Develop and implement a stormwater project, including engineering analysis that will minimize flooding for this area and improve drainage. Upgrade undersized stormwater drains and culverts.	Incomplete	Modify	Modify action item to effectively meet the needs of the community.
5	Educate community on the dangers of low water crossings through the installation of warning signs and promotion of "Turn Around, Don't Drown" Program. Establish a public awareness program regarding availability of flood insurance by disseminating brochures in public places, such as City Hall.	Incomplete	Modify	All public awareness and education campaigns to be combined into one mitigation action item.
6	Allow no vegetation in easements or require fire resistant landscaping.	Incomplete	Modify	Incorporated into CWPP adopted by Brown County September 2024. To be modified for future action item within county-wide actions.
7	Install fire danger rating/burn ban signs.	Incomplete	Continue	Unable to obtain funding. Remains priority of jurisdiction.
8	Build safe room shelters at manufactured home parks so that all park residents can reach shelter in less than five minutes.	Incomplete	Continue	Unable to obtain funding. Remains priority of jurisdiction. To be continued with slight modification.
9	Install warning signs at hazardous bridges and roadways subject to ice.	Complete	Discontinue	Signs installed.
10	Adopt and implement a routine tree trimming program that clears tree limbs near power lines and/or hanging in right-of-way; Remove the dead trees from right-of way and drainage systems on a scheduled basis.	Complete	Discontinue	To be continued through standard operating procedures and emergency management.

National Flood Insurance Program

44 CFR REQUIREMENT

Requirement 44 CFR § 201.6(c)(2)(ii) The plan addresses NFIP-insured structures that have been repetitively damaged by floods.

Requirement 44 CFR § 201.6(c)(3)(ii) The plan addresses each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate.

NFIP-Related Actions

The participating jurisdictions have and will continue to address flooding and stormwater runoff throughout the HMAP process, the emergency management cycle, and emergency operations plans. Additional flood management planning will continue to occur in high flood hazard areas. The county is an active participant of the NFIP; however, additional community education is necessary to ensure residents and business are aware of the program benefits. All NFIP participating jurisdictions are in good standing. There have been 226 NFIP claims in Brown County and less than 10 severe repetitive loss properties. Brown County tracks the specific locations of these properties; however, these locations were unavailable for mapping within the HMAP.

Brown County, Bangs, Blanket, Brownwood, and Early make Substantial Damage determinations and require owners to obtain permits to bring substantially damaged bildings into compliance with the floodplain management requirements.

Participation Goals

The flood hazard areas throughout the participating jurisdictions 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 convey flood waters more adequately. It is the purpose of all 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 the NFIP participating jurisdictions in the HMAP are guided by their local Flood Damage Prevention Ordinance. These communities will continue to comply with NFIP requirements through their local permitting, inspection, and record-keeping requirements for new and substantially developed construction. Further, the NFIP program for the participating jurisdictions 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 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.
- ✓ Ensure that potential buyers are notified that property is in a flood area.

Participation Guidelines

To accomplish these tasks, all NFIP participating jurisdictions (*Brown County, Bangs, Blanket, Brownwood, and Early*) 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.
- ✓ Prevent or regulate the construction of flood barriers which will unnaturally divert floodwaters, or which may increase flood hazards to other lands.
- ✓ Utilize regulatory flood mapping products for official actions required by NFIP.

Compliance and Maintenance

While flooding was identified by most of the participating jurisdictions as a moderate-risk hazard during hazard ranking activities in the risk assessment, many of the mitigation actions were developed with flood mitigation in mind due to the destructive nature of flood events. Most of these flood actions address compliance with the NFIP and implementing flood awareness programs. All NFIP participating jurisdictions recognize the need and are working towards adopting higher NFIP regulatory standards to further minimize flood risk in their community. In addition, all jurisdictions are focusing on NFIP public awareness activities (for example, promoting the availability of flood insurance by placing NFIP brochures and flyers in public libraries or public meeting places). All participating jurisdictions in the NFIP have a designated floodplain administrator. The floodplain administrators will continue to maintain compliance with the NFIP including continued floodplain administration, zoning ordinances, and development regulations. The floodplain ordinance adopted by each participating jurisdiction outlines the minimum requirements for development in special flood hazard areas.

Repetitive and Severe Repetitive Loss Properties

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 SRL 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 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 claim 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.

TABLE 7-8. *Repetitive Loss (RL) Properties, FEMA*

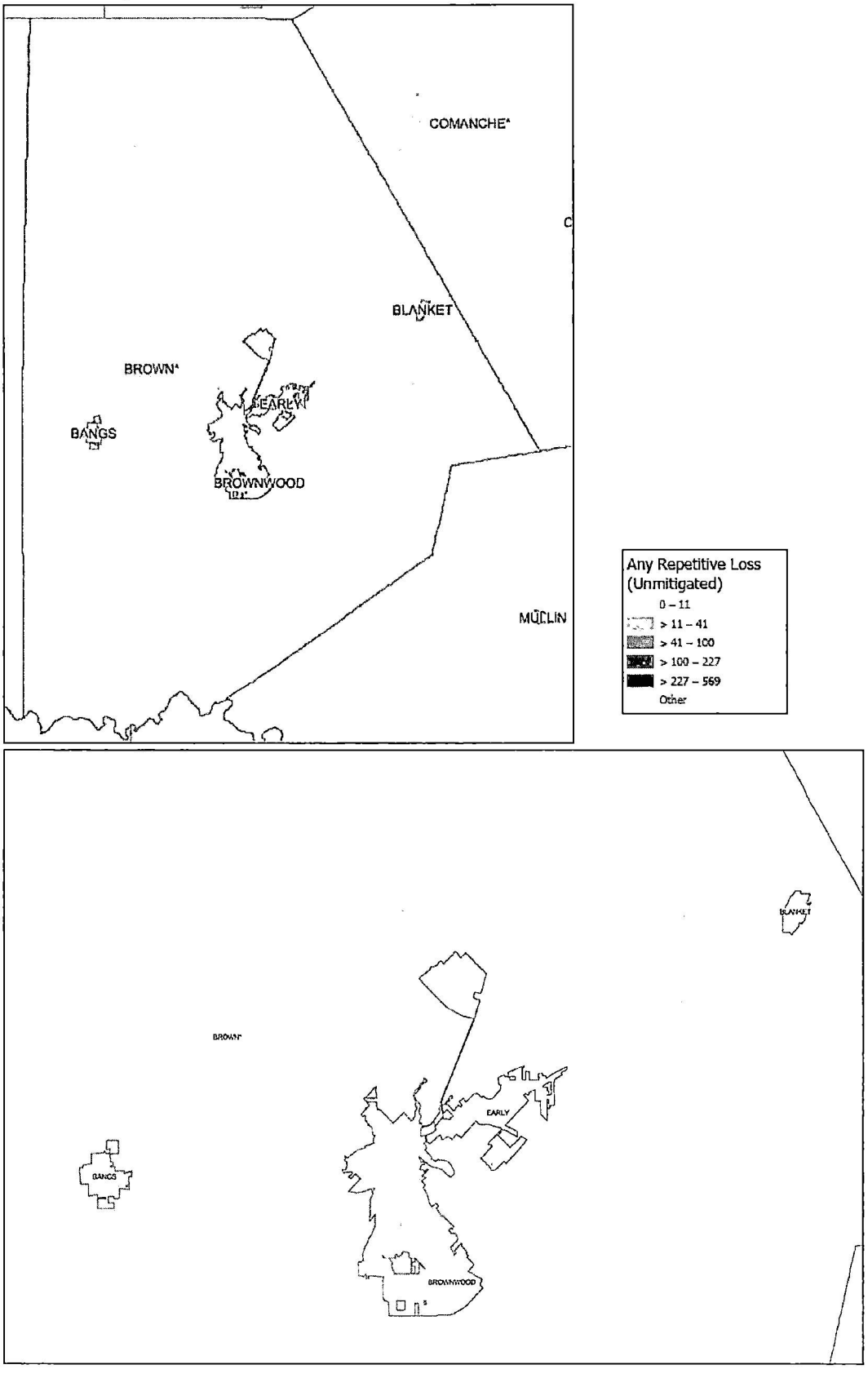
JURISDICTION	Any RL	Any RL Unmitigated	Any RL Unmitigated/ Insured	FMA RL	FMA SRL	NFIP RL	NFIP SRL
County	25	25	9	4	9	21	5
Bangs	1	0	0	0	0	0	0
Blanket	0	0	0	0	0	0	0
Brownwood	27	26	7	4	9	24	8
Early	2	2	1	0	1	2	0

TABLE 7-9. *Repetitive Loss (RL) Properties by Type*

	PROPERTY USE			PROPERTY CONSTRUCTION TYPE			
JURISDICTION	RESIDENTIAL	COMMERCIAL	INDUSTRIAL	PIER & BEAM	SLAB ON GRADE	OTHER	TOTAL
County							98
Bangs							1
Blanket							0
Brownwood							105
Early							8

† Data Deficiencies: RL and SRL properties are not currently tracked by use or type, potential flood depths, inundation zone mapping.

FIGURE 7-1. *Repetitive Loss Maps*[64]



[64] https://www.arcgis.com/home/item.html?id=872bbaf7dfbb48cb88d244c7123e4d9d

SECTION 8: ACTION PLAN

44 CFR REQUIREMENT
Requirement 44 CFR § 201.6(c)(3)(ii) The plan identifies and analyzes a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure.
Requirement 44 CFR § 201.6(c)(3)(iii) The plan contains an action plan that describes how the actions identified will be prioritized (including a cost-benefit review), implemented, and administered by each jurisdiction. The plan describes the criteria used for prioritizing actions.
Requirement 44 CFR § 201.6(c)(3)(ii) The plan includes one or more action(s) per jurisdiction for each of the hazards as identified within the plan's risk assessment.
Requirement HHPD The plan links proposed actions to reducing long-term vulnerabilities that are consistent with its goals.
Requirement HHPD The plan describes specific actions to address HHPDs.
Requirement HHPD The plan identifies the position, office, department, or agency responsible for implementing and administering the action to mitigate hazards to or from HHPDs.

The following actions were developed using the risk assessment matrix by vulnerable areas. Risks, vulnerabilities, capabilities, and impacts were identified and prioritized within each participating jurisdiction to create a hazard mitigation action plan to be implemented, reviewed, and revised as necessary. The mitigation action items were prioritized based on current access to funding. These prioritization levels are described below and do not reflect the level of importance placed upon each action item by the planning team, only the current ability to implement the task based on funding sources available.

In a multi-jurisdictional HMAP, or MJHMAP, each jurisdiction must develop a list of specific mitigation actions for the hazards that affect the jurisdiction. It is encouraged to include one or more actions per jurisdiction for each identified hazard; however, the participating jurisdictions assessed the risks and prioritized the action items. Some mitigation actions address a single hazard, while others address two or more hazards. Certain mitigation actions have been developed with an 'all-hazards' approach, including public education and awareness campaigns. Public education and awareness campaigns will be developed individually by each participating jurisdiction in accordance with jurisdictional-specific needs, capabilities, vulnerabilities, and risks. Several mitigation action items address "All-Hazards". This includes all identified hazards listed in Section 2 and profiled in Section 4:

Hailstorm, severe wind, tornado, lightning, severe winter storm, drought, flood/stormwater runoff, earthquake, expansive soil, wildfire, infectious disease, transportation incident (roadways), aircraft incident, train derailment, communication and/or computer database failure, dam failure, power failure, HAZMAT release, factory explosion, structure collapse, urban fire (unintentional), pipeline spill/release, water main break, active shooter/active attack, cyberattack, power grid attack, water supply contamination, HAZMAT attack, malicious wildfire or urban fire, civil unrest

Mitigation actions can be based on the common actions outlined in the MJHMAP but must be tailored to the jurisdiction. City leadership, key personnel, stakeholders, and residents within each participating jurisdiction met independently and determined that most mitigation actions appropriate for implementation were fully discussed, evaluated, and added within the county-wide action items developed collaboratively by all participating jurisdictions during planning meetings.

TABLE 8-1. Description of Mitigation Action Item Priority Level Categories (does not signify importance of mitigation action)

PRIORITY	DESCRIPTION
HIGH	Action **will be implemented** as soon as funding is received.
MODERATE	Action **may not be implemented** right away depending on the cost and number of citizens served by the action.
LOW	Action **will not be implemented without first seeking grant funding** and after "high" and "moderate" actions have been completed.

City leadership, key personnel, stakeholders, and residents within each participating jurisdiction met independently and determined the mitigation actions developed collaboratively during county-wide planning meetings were fully discussed, evaluated, and added as county-wide action items. These action items were determined to be appropriate for implementation across all participating jurisdictions. Therefore, all subsequent mitigation action items listed as "county-wide" have been designed for Brown County, all unincorporated areas of Brown County, and all participating jurisdictions. To limit the length of this HMAP, these mitigation actions are included in each participating jurisdiction's action plan but will not be duplicated in this document.

County-Wide

County-wide mitigation actions apply to the mitigation action plan of all participating jurisdictions: Brown County (including all unincorporated areas), Bangs, Blanket, Brookesmith ISD, Brownwood, and Early).

Public Education	Priority Level: High
COUNTY-WIDE: Develop and implement a comprehensive multi-hazard public awareness program providing information on preparedness, mitigation measures, and responses during hazard events.	
Responsible Department(s):	Emergency Management Public Information
Schedule:	Continuous Upon Plan Adoption
Mitigation Type:	Education/ Awareness
Estimated Cost:	$5,000
Primary Funding:	LOCAL: Staff Time
Secondary Funding:	LOCAL: General Operating Budget
Hazards Addressed:	All-Hazards (all identified natural, technological, and human caused hazards):
Integration:	PROGRAM: Public Education/Awareness
Mitigation Action Benefits:	Program may include NOAA materials and radios, TFS support, permanent warning signs, emergency alert registration, all-hazards education such as heat/drought, floods, low water crossing safety and awareness, public health/safety, tornadoes, etc. Establish increased awareness of potential dangers and empower individuals to take preventative measures, reducing the likelihood of damage to life and property.

Expand Stakeholder Participation	Priority Level: High
COUNTY-WIDE: Expand public and stakeholder participation in the hazard mitigation planning process.	
Responsible Department(s):	Administration Emergency Management
Schedule:	0-12 Months of Plan Adoption
Mitigation Type:	Education/ Awareness
Estimated Cost:	$5,000
Primary Funding:	LOCAL: Staff Time
Secondary Funding:	LOCAL: General Operating Budget
Hazards Addressed:	All-Hazards
Integration:	PROGRAM: Public Education/Awareness
Mitigation Action Benefits:	Enhanced risk understanding and mitigation priorities; improved mitigation strategies; increased community resilience; better communication and integration into other planning mechanisms; increased collaboration; shared responsibility

Storm Siren Systems	Priority Level: High
COUNTY-WIDE: Install emergency storm and warning siren system.	
Responsible Department(s):	Emergency Management Public Works
Schedule:	12-24 Months of Plan Adoption
Mitigation Type:	Structure/ Infrastructure Project
Estimated Cost:	$190,000
Primary Funding:	STATE/FEDERAL: Potential Resources to be Identified (Grant Funding Opportunities)
Secondary Funding:	LOCAL: General Operating Budget
Hazards Addressed:	Tornado Severe Wind
Integration:	PLAN: Emergency Operations Plan
Mitigation Action Benefits:	Early warning systems help save lives by giving people time to evacuate or shelter in place. Emergency warning systems help enable a rapid response by the public to emergencies to help people help themselves.

Community and Residential Safe Rooms	Priority Level: High
COUNTY-WIDE: Implement programs for the construction of community and residential safe rooms in high-risk locations including but not limited to isolated rural neighborhoods, populated residential or business subdivisions, mobile home parks, campgrounds, and schools.	
Responsible Department(s):	Facility Maintenance Grant Writer
Schedule:	0-60 Months of Plan Adoption
Mitigation Type:	Structure/ Infrastructure Project
Estimated Cost:	$5,000 - $5,000,000 Depending on project type and scope (i.e. residential versus community)
Primary Funding:	STATE/FEDERAL: Potential Resources to be Identified (Grant Funding Opportunities)
Secondary Funding:	LOCAL: General Operating Budget
Hazards Addressed:	Tornado Severe Wind
Integration:	PLAN: Emergency Operations Plan
Mitigation Action Benefits:	Community and residential safe rooms protect people from severe weather such as tornados, severe straight-line winds, hail, and other hazards.

Wildland Urban Interface	Priority Level: Moderate
COUNTY-WIDE: Clear hazardous overgrowth and vegetation to minimize wildfire risk.	
Responsible Department(s):	Fire Department Emergency Management
Schedule:	0-12 Months of Plan Adoption
Mitigation Type:	Natural System Protection
Estimated Cost:	$10,000
Primary Funding:	STATE/FEDERAL: Potential Resources to be Identified (Grant Funding Opportunities)
Secondary Funding:	PRIVATE-SECTOR: Funding, Resources, and Partnerships to be Identified/Specified
Hazards Addressed:	Wildfire Wildfire/Urban Fire (Intentional)
Integration:	PLAN: Community Wildfire Protection Plan
Mitigation Action Benefits:	Clearing hazardous overgrowth and vegetation reduces available fuel for wildfire development and expansion. A reduction in wildfire potential increases protection of lives and property, reduces response costs, and minimizes impacts on the economy.

Critical Facility Generators	Priority Level: Low
COUNTY-WIDE: Acquire and install generators with hard-wired quick connections at all critical facilities.	
Responsible Department(s):	Administrative Personnel Emergency Management
Schedule:	24-36 Months of Plan Adoption
Mitigation Type:	Structure/ Infrastructure Project
Estimated Cost:	$20,000 - $120,000 Depending on facility size, power requirements, and installation challenges.
Primary Funding:	STATE/FEDERAL: Potential Resources to be Identified (Grant Funding Opportunities)
Secondary Funding:	LOCAL: General Operating Budget
Hazards Addressed:	Power Failure Comms/Database Failure
Integration:	PLAN: Continuity of Operations Plan
Mitigation Action Benefits:	Maintain continuity of operations during power outages within critical facilities.

Retrofit Critical Facilities	Priority Level: Low
COUNTY-WIDE: Harden/ retrofit critical facilities to hazard-resistant levels.	
Responsible Department(s):	Administrative Personnel Emergency Management
Schedule:	24-36 Months of Plan Adoption
Mitigation Type:	Structure/ Infrastructure Project
Estimated Cost:	$20,000 - $2,000,000 Depending on size and scope of critical facility upgrade requirements.
Primary Funding:	STATE/FEDERAL: Potential Resources to be Identified (Grant Funding Opportunities)
Secondary Funding:	LOCAL: General Operating Budget
Hazards Addressed:	Tornado Structure Collapse
Integration:	PLAN: Capital Improvements Plan
Mitigation Action Benefits:	The hardening of critical facilities enhances disaster resilience by ensuring that essential services remain operational during emergencies. By reinforcing structures and improving preparedness, these facilities can withstand adverse conditions while providing necessary support to the community.

Drains and Culverts	Priority Level: Low
COUNTY-WIDE: Upgrade stormwater drains and culverts.	
Responsible Department(s):	Administrative Personnel Emergency Management
Schedule:	24-36 Months of Plan Adoption
Mitigation Type:	Structure/ Infrastructure Project
Estimated Cost:	The cost to upgrade stormwater street drains and culverts can vary widely, depending on the type, size, scope, and location of the project.
Primary Funding:	STATE/FEDERAL: Potential Resources to be Identified (Grant Funding Opportunities)
Secondary Funding:	LOCAL: General Operating Budget
Hazards Addressed:	Flood Stormwater Runoff
Integration:	PLAN: Stormwater Management Plan
Mitigation Action Benefits:	Effective stormwater management provides environmental, social, and economic benefits to local communities. When stormwater management is done well, streams, rivers, and lakes are cleaner; flood risks are reduced; costs due to flood damage decrease; and community quality of life increases.

Brown County

County-Wide Mitigation Actions are also included in the Brown County Action Plan.

Inundation Zone Mapping — **Priority Level: High**

Obtain engineering analysis of dams and inundation zone mapping for all High Hazard Potential Dams and improve flood mapping to include potential flood depths in all vulnerable areas across the county.

Responsible Department(s):	Brown County Floodplain Administrator
	Brownwood Country Club, Brown County Water Improvement District, Pecan Bayou Soil and Water Conservation District
Schedule:	24-36 Months of Plan Adoption
Mitigation Type:	Local Plans/ Regulations
Estimated Cost:	$500,000.00
Primary Funding:	LOCAL: General Operating Budget
Secondary Funding:	LOCAL: Staff Time
Hazards Addressed:	Flood/ Stormwater Runoff/ Dam Failure
Integration:	PROGRAM: Floodplain Maps/Flood Insurance Studies
Mitigation Benefits:	Reduce losses by informing communities about potential flood zones, enabling informed decisions on development and infrastructure, and facilitating the implementation of flood mitigation measures.

NFIP Repetitive Loss Tracking — **Priority Level: High**

Establish a system for tracking historical damage patterns and repetitive loss properties, including use (residential, commercial, industrial) or construction type (pier and beam or slab on grade).

Responsible Department(s):	Brown County Floodplain Administrator
	Emergency Manager
Schedule:	0-12 Months of Plan Adoption
Mitigation Type:	Local Plans/ Regulations
Estimated Cost:	$5,000.00
Primary Funding:	LOCAL: Staff Time
Secondary Funding:	LOCAL: General Operating Budget
Hazards Addressed:	Flood/ Stormwater Runoff/ Dam Failure
Integration:	PROGRAM: Floodplain Maps/Flood Insurance Studies
Mitigation Benefits:	Effective monitoring and timely address of repetitive loss properties and historical damage patterns. Tracking mechanism will enhance ccordination, improve community resilience, and minimize future losses through targeted risk reduction measures and mitigation.

Dam Improvements — **Priority Level: Low**

Assess High Hazard Potential Dams, prioritize safety improvements, and implement necessary measures, including structural upgrades, emergency planning, and ongoing monitoring.

Responsible Department(s):	Brown County EMC, Administration, Commissioners
	Pecan Bayou Soil and Water Conservation Board (SWCD)
Schedule:	24-36 Months of Plan Adoption
Mitigation Type:	Structure/ Infrastructure Project
Estimated Cost:	$100,000
Primary Funding:	STATE/FEDERAL: Potential Resources to be Identified (Grant Funding Opportunities)
Secondary Funding:	LOCAL: General Operating Budget
Hazards Addressed:	Flood/ Stormwater Runoff/ Dam Failure
Integration:	PLAN: Capital Improvements Plan
Strategy Goal	Goal 2, Objective 2.8
Mitigation Action Benefits:	Replacing or repairing unsatisfactory dam conditions minimizes the risk of dam failures which lead to secondary flood hazards, including human and economic impacts.

Communication Interoperability	Priority Level: Low

Develop, implement, and maintain a public safety trunked radio system capable of operability with 100 percent county wide portable radio coverage that can integrate with a region wide system and interoperability on a statewide trunked radio system.

Responsible Department(s):	Administration Emergency Management
Schedule:	24-36 Months of Plan Adoption
Mitigation Type:	Structure/ Infrastructure Project
Estimated Cost:	$5,000,000 per county
Primary Funding:	STATE/FEDERAL: Potential Resources to be Identified (Grant Funding Opportunities)
Secondary Funding:	LOCAL: Capital Improvement Budgets
Hazards Addressed:	Comms/Database Failure All-Hazards
Integration:	PLAN: Communications Plan
Mitigation Action Benefits:	A trunked radio system will provide radio service across the entire county and a level of safety and security for first responders and the public that is unprecedented. A combination of upgrades in land mobile radio technology trunking systems, radio over internet protocol (RoIP), and/or Radio over LTE, provide opportunities for a quality of land mobile radio communication in the county that was previously impossible to accomplish. Connection of the system to a region wide system will provide voice interoperability across the region. Connection to a statewide radio system will provide voice interoperability statewide. This mitigation action requires support from all participating jurisdictions and would directly affect communications within all participating jurisdictions.

Bangs

County-Wide Mitigation Actions are also included in the Bangs Action Plan.

NFIP Repetitive Loss Tracking	Priority Level: High
Establish a system for tracking historical damage patterns and repetitive loss properties, including use (residential, commercial, industrial) or construction type (pier and beam or slab on grade).	
Responsible Department(s):	Brown County Floodplain Administrator Emergency Manager
Schedule:	0-12 Months of Plan Adoption
Mitigation Type:	Local Plans/ Regulations
Estimated Cost:	$5,000.00
Primary Funding:	LOCAL: Staff Time
Secondary Funding:	LOCAL: General Operating Budget
Hazards Addressed:	Flood/ Stormwater Runoff/ Dam Failure
Integration:	PROGRAM: Floodplain Maps/Flood Insurance Studies
Mitigation Benefits:	Effective monitoring and timely address of repetitive loss properties and historical damage patterns. Tracking mechanism will enhance ccordination, improve community resilience, and minimize future losses through targeted risk reduction measures and mitigation.

Community Shelter	Priority Level: Low
Retrofit the community center to serve as an emergency shelter and cooling/heating station during extreme weather events.	
Responsible Department(s):	Public Works Law Enforcement
Schedule:	24-36 Months of Plan Adoption
Type of Mitigation:	Structure/ Infrastructure Project
Estimated Cost:	$2,000,000
Primary Funding:	STATE/FEDERAL: Potential Resources to be Identified (Grant Funding Opportunities)
Secondary Funding:	LOCAL: To be Identified (Loans, In-Kind Resources, Local Revenue-Generating Mechanisms, Philanthropic Resources)
Hazards Addressed:	All-Hazards
Integration:	PLAN: Emergency Operations Plan
Mitigation Action Benefits:	Community shelters protect people from severe weather such as tornados, severe winds, hail, heat, cold, and other hazards.

Blanket

County-Wide Mitigation Actions are also included in the Blanket Action Plan.

NFIP Repetitive Loss Tracking	Priority Level: High
Establish a system for tracking historical damage patterns and repetitive loss properties, including use (residential, commercial, industrial) or construction type (pier and beam or slab on grade).	
Responsible Department(s):	Brown County Floodplain Administrator
	Emergency Manager
Schedule:	0-12 Months of Plan Adoption
Mitigation Type:	Local Plans/ Regulations
Estimated Cost:	$5,000.00
Primary Funding:	LOCAL: Staff Time
Secondary Funding:	LOCAL: General Operating Budget
Hazards Addressed:	Flood/ Stormwater Runoff/ Dam Failure
Integration:	PROGRAM: Floodplain Maps/Flood Insurance Studies
Mitigation Benefits:	Effective monitoring and timely address of repetitive loss properties and historical damage patterns. Tracking mechanism will enhance ccordination, improve community resilience, and minimize future losses through targeted risk reduction measures and mitigation.

Water Meters	Priority Level: Low
Replace existing/outdated water meters and isolation valves.	
Responsible Department(s):	Administrative Personnel
	Water Department
Schedule:	24-36 Months of Plan Adoption
Mitigation Type:	Structure/ Infrastructure Project
Estimated Cost:	$350,000
Primary Funding:	STATE/FEDERAL: Potential Resources to be Identified (Grant Funding Opportunities)
Secondary Funding:	LOCAL: General Operating Budget
Hazards Addressed:	Drought
	Water Supply Contamination (Intentional)
Integration:	PLAN: Capital Improvements Plan
Mitigation Action Benefits:	Integrate into Water Department policy and city ordinance. Modernize degraded meter system; improve personnel safety; increase water distribution efficiency; improve water conservation through the detection; minimize water leakage during drought conditions; long-term cost-benefit analysis would improve overall water distribution/ conservation activities.

Water Lines	Priority Level: Low
Replace existing/outdated water line infrastructure.	
Responsible Department(s):	Administrative Personnel
	Water Department
Schedule:	24-36 Months of Plan Adoption
Mitigation Type:	Structure/ Infrastructure Project
Estimated Cost:	The cost of upgrading water lines can vary widely, depending on the size and scope of the project, the materials used, and the labor costs (approximately 35-40% of total cost).
Primary Funding:	STATE/FEDERAL: Potential Resources to be Identified (Grant Funding Opportunities)
Secondary Funding:	LOCAL: General Operating Budget
Hazards Addressed:	Flood
	Drought
Integration:	PLAN: Capital Improvements Plan
Mitigation Action Benefits:	Replacing or repairing outdated water lines minimizes the risk of water main breaks, improves water efficiency during drought conditions, and decreases the risk of water contamination.

Brookesmith ISD

County-Wide Mitigation Actions are also included in the Brookesmith ISD Action Plan.

Radio Access to Dispatch	Priority Level: Moderate
Acquire direct radio communication capabilities with dispatch and first responders.	
Responsible Department(s):	Administrative Personnel NA
Schedule:	12-24 Months of Plan Adoption
Mitigation Type:	Emergency Services
Estimated Cost:	$2,000
Primary Funding:	LOCAL: To be Identified (Loans, In-Kind Resources, Local Revenue-Generating Mechanisms, Philanthropic Resources)
Secondary Funding:	STATE/FEDERAL: Potential Resources to be Identified (Grant Funding Opportunities)
Hazards Addressed:	All-Hazards
Integration:	PLAN: Emergency Operations Plan
Mitigation Action Benefits:	Facilitate expedited communication with emergency services during a hazard event.

Weapon Security	Priority Level: Low
Acquire and install system for the safe storage of weapons and ammunition necessary for use by ISD marshals and guardians, in accordance with Texas House Bill 1009.	
Responsible Department(s):	Administrative Personnel NA
Schedule:	12-24 Months of Plan Adoption
Mitigation Type:	Emergency Services
Estimated Cost:	$10,000
Primary Funding:	STATE/FEDERAL: Potential Resources to be Identified (Grant Funding Opportunities)
Secondary Funding:	ACADEMIC INSTITUTIONS: Potential Resources to be Identified
Hazards Addressed:	Active Shooter/Attack
Integration:	PLAN: Emergency Operations Plan
Mitigation Action Benefits:	Adhere to the safety conditions set forth by Texas House Bill 1009, Texas Education Agency, and Brookesmith ISD to improve the safety of students, staff, and visitors.

Panic Buttons	Priority Level: Low
Acquire and install panic buttons in key locations across campus.	
Responsible Department(s):	Administrative Personnel NA
Schedule:	12-24 Months of Plan Adoption
Mitigation Type:	Emergency Services
Estimated Cost:	$15,000
Primary Funding:	STATE/FEDERAL: Potential Resources to be Identified (Grant Funding Opportunities)
Secondary Funding:	ACADEMIC INSTITUTIONS: Potential Resources to be Identified
Hazards Addressed:	Active Shooter/Attack
Integration:	PLAN: Emergency Operations Plan
Mitigation Action Benefits:	Immediate emergency notification directly to dispatch and emergency services to reduce response times of first responders, especially during situations when protective measures make phone calls difficult and/or time-consuming while ensuring the safety of students, staff, and visitors.

Perimeter Fencing and Gates	Priority Level:	Low

Install and/or upgrade campus perimeter fencing, security gates, doors, and windows with interior vestibules, ballistic resistant glass film, and reinforced doors and locking mechanisms.

Responsible Department(s):	Administrative Personnel NA
Schedule:	24-36 Months of Plan Adoption
Mitigation Type:	Structure/ Infrastructure Project
Estimated Cost:	$100,000
Primary Funding:	STATE/FEDERAL: Potential Resources to be Identified (Grant Funding Opportunities)
Secondary Funding:	ACADEMIC INSTITUTIONS: Potential Resources to be Identified
Hazards Addressed:	Active Shooter/Attack
Integration:	PLAN: Emergency Operations Plan
Mitigation Action Benefits:	Provide increased deterrence and barriers to active attacks with layered security measures.

Safety Vests	Priority Level:	Low

Acquire and train with safety vests and other modes of identification for use during emergencies, evacuations, and incident management.

Responsible Department(s):	Administrative Personnel NA
Schedule:	0-12 Months of Plan Adoption
Mitigation Type:	Emergency Services
Estimated Cost:	$10,000
Primary Funding:	STATE/FEDERAL: Potential Resources to be Identified (Grant Funding Opportunities)
Secondary Funding:	ACADEMIC INSTITUTIONS: Potential Resources to be Identified
Hazards Addressed:	All-Hazards
Integration:	PLAN: Emergency Operations Plan
Mitigation Action Benefits:	Provide easy identification of personnel during times of crisis, especially during incident response activities and family reunification.

Brownwood

County-Wide Mitigation Actions are also included in the Brownwood Action Plan.

NFIP Repetitive Loss Tracking — **Priority Level: High**

Establish a system for tracking historical damage patterns and repetitive loss properties, including use (residential, commercial, industrial) or construction type (pier and beam or slab on grade).

Responsible Department(s):	Brown County Floodplain Administrator Emergency Manager
Schedule:	0-12 Months of Plan Adoption
Mitigation Type:	Local Plans/ Regulations
Estimated Cost:	$5,000.00
Primary Funding:	LOCAL: Staff Time
Secondary Funding:	LOCAL: General Operating Budget
Hazards Addressed:	Flood/ Stormwater Runoff/ Dam Failure
Integration:	PROGRAM: Floodplain Maps/Flood Insurance Studies
Mitigation Benefits:	Effective monitoring and timely address of repetitive loss properties and historical damage patterns. Tracking mechanism will enhance ccordination, improve community resilience, and minimize future losses through targeted risk reduction measures and mitigation.

Training Assessment — **Priority Level: High**

Conduct a comprehensive training assessment to determine gaps and draft a corresponding training plan to be implemented based on Incident Command Structure (ICS) and assessed risks/hazards.

Responsible Department(s):	Health Department Emergency Management
Schedule:	12-24 Months of Plan Adoption
Mitigation Type:	Local Plans/ Regulations
Estimated Cost:	$5,000
Primary Funding:	LOCAL: Staff Time
Secondary Funding:	LOCAL: General Operating Budget
Hazards Addressed:	All-Hazards
Integration:	PLAN: Emergency Operations Plan
Mitigation Action Benefits:	Enhances first responder, emergency management, emergency preparedness, and organizational readiness to improve capabilities and fill existing gaps. NOTE: Brownwood/Brown County Public Health Department supports all jurisdictions and residents within Brown County.

First Responder Health and Safety — **Priority Level: High**

Implement a first responder immunization education and vaccination process to protect health and ensure continuity of service.

Responsible Department(s):	Health Department Emergency Management
Schedule:	12-24 Months of Plan Adoption
Mitigation Type:	Emergency Services
Estimated Cost:	$10,000
Primary Funding:	LOCAL: Staff Time
Secondary Funding:	LOCAL: General Operating Budget
Hazards Addressed:	All-Hazards
Integration:	PLAN: Emergency Operations Plan
Mitigation Action Benefits:	Increases the health and safety of first responders to maximize response and recovery activities and capabilities to the public. NOTE: Brownwood/Brown County Public Health Department supports all jurisdictions and residents within Brown County.

Mutual Aid Agreements	Priority Level: High
Develop/update mutual aid agreements with local and regional partners and stakeholders.	
Responsible Department(s):	Emergency Management Administration
Schedule:	0-12 Months of Plan Adoption
Mitigation Type:	Local Plans/ Regulations
Estimated Cost:	$5,000
Primary Funding:	LOCAL: Staff Time
Secondary Funding:	LOCAL: General Operating Budget
Hazards Addressed:	All-Hazards
Integration:	PLAN: Emergency Operations Plan
Mitigation Action Benefits:	Updated agreements improve emergency response activities and clarify how and when organizations share resources, such as personnel, equipment, and supplies to ensure incidents are handled effectively. Cross-organizational reimbursements are outlined. Defined procedures support jurisdictional requests for mutual aid cost reimbursement from FEMA, if certain conditions are met.

Identification of Vulnerable Populations	Priority Level: High
Expand and ensure the identification of vulnerable populations and incorporate considerations related to risks and hazards into planning mechanisms.	
Responsible Department(s):	Health Department Emergency Management
Schedule:	0-12 Months of Plan Adoption
Mitigation Type:	Local Plans/ Regulations
Estimated Cost:	$5,000
Primary Funding:	LOCAL: Staff Time
Secondary Funding:	LOCAL: General Operating Budget
Hazards Addressed:	All-Hazards
Integration:	PLAN: Emergency Operations Plan
Mitigation Action Benefits:	Improve the health and safety of vulnerable populations during hazard events. NOTE: Brownwood/Brown County Public Health Department supports all jurisdictions and residents within Brown County.

Stormwater Detention/Retention Basins	Priority Level: Moderate
Construct stormwater detention/retention basins in conjunction with new development.	
Responsible Department(s):	Planning and Development Public Works
Schedule:	12-24 Months of Plan Adoption
Mitigation Type:	Local Plans/ Regulations
Estimated Cost:	$6,000,000
Primary Funding:	PRIVATE-SECTOR: Funding, Resources, and Partnerships to be Identified/Specified
Secondary Funding:	STATE/FEDERAL: Potential Resources to be Identified (Grant Funding Opportunities)
Hazards Addressed:	Flood Stormwater Runoff
Integration:	PLAN: Stormwater Management Plan
Mitigation Action Benefits:	Improved flood control, water quality, erosion control, and sedimentation control; additional economic opportunities for land use planning; preservation of wildlife habitats; and decreased risk of accidental spillage.

Magnolia Ditch Project	Priority Level: Moderate
Construct and install ditch and culvert to reduce flooding to 400 residents that live in three apartment complexes and duplexes in the area.	
Responsible Department(s):	Public Works
	Planning and Zoning
Schedule:	12-24 Months of Plan Adoption
Mitigation Type:	Structure/ Infrastructure Project
Estimated Cost:	$5,000,000
Primary Funding:	LOCAL: General Operating Budget
Secondary Funding:	STATE/FEDERAL: Potential Resources to be Identified (Grant Funding Opportunities)
Hazards Addressed:	Flood
	Stormwater Runoff
Integration:	PLAN: Stormwater Management Plan
Mitigation Action Benefits:	Reduced flood damage; improved quality of life; increased property values and investments create economic growth; increased protection of the natural environment by reducing erosion, improving water quality, and promoting biodiversity; and flood control projects can create permanent assets for communities.

Capital Improvement Program Fund	Priority Level: Moderate
Establish a Capital Improvement Program Fund to mitigate future hazard damages.	
Responsible Department(s):	Administration
	Finance Department
Schedule:	12-24 Months of Plan Adoption
Mitigation Type:	Local Plans/ Regulations
Estimated Cost:	$15,000,000
Primary Funding:	LOCAL: Capital Improvement Budgets
Secondary Funding:	LOCAL: General Operating Budget
Hazards Addressed:	All-Hazards
Integration:	PLAN: Capital Improvements Plan
Mitigation Action Benefits:	Enhanced capability to provide effective hazard mitigation across the jurisdiction through capital improvements.

Early

County-Wide Mitigation Actions are also included in the Early Action Plan.

NFIP Repetitive Loss Tracking	Priority Level: High
Establish a system for tracking historical damage patterns and repetitive loss properties, including use (residential, commercial, industrial) or construction type (pier and beam or slab on grade).	
Responsible Department(s):	Brown County Floodplain Administrator Emergency Manager
Schedule:	0-12 Months of Plan Adoption
Mitigation Type:	Local Plans/ Regulations
Estimated Cost:	$5,000.00
Primary Funding:	LOCAL: Staff Time
Secondary Funding:	LOCAL: General Operating Budget
Hazards Addressed:	Flood/ Stormwater Runoff/ Dam Failure
Integration:	PROGRAM: Floodplain Maps/Flood Insurance Studies
Mitigation Benefits:	Effective monitoring and timely address of repetitive loss properties and historical damage patterns. Tracking mechanism will enhance ccordination, improve community resilience, and minimize future losses through targeted risk reduction measures and mitigation.

Stormwater Detention / Retention Basins	Priority Level: Moderate
Construct or reconstruct stormwater detention/retention basins.	
Responsible Department(s):	Planning and Development Public Works
Schedule:	Continuous Upon Plan Adoption
Mitigation Type:	Structure/ Infrastructure Project
Estimated Cost:	$3,000,000
Primary Funding:	LOCAL: General Operating Budget
Secondary Funding:	STATE/FEDERAL: Potential Resources to be Identified (Grant Funding Opportunities)
Hazards Addressed:	Flood Stormwater Runoff
Integration:	PLAN: Stormwater Management Plan
Mitigation Action Benefits:	Improved flood control, water quality, erosion control, and sedimentation control; additional economic opportunities for land use planning; preservation of wildlife habitats; and decreased risk of accidental spillage.

Fire Danger / Burn Ban Signs	Priority Level: Low
Install fire danger and burn ban signs at key locations on roadways and public facilities.	
Responsible Department(s):	Fire Department Law Enforcement
Schedule:	0-12 Months of Plan Adoption
Mitigation Type:	Structure/ Infrastructure Project
Estimated Cost:	$20,000
Primary Funding:	STATE/FEDERAL: Potential Resources to be Identified (Grant Funding Opportunities)
Secondary Funding:	LOCAL: General Operating Budget
Hazards Addressed:	Wildfire Urban Fire (Unintentional)
Integration:	PLAN: Emergency Operations Plan
Mitigation Action Benefits:	Provide community awareness and continuous warning regarding fire conditions and risks to the public. Improved community preparedness. Decreased risk of urban fires and wildfires due to individual actions for prevention across the community.

SECTION 9: MAINTENANCE

44 CFR REQUIREMENT
Requirement 44 CFR § 201.6(c)(4)(iii) The plan includes a discussion of how each community will continue public participation in the plan maintenance process.
Requirement 44 CFR § 201.6(c)(4)(j) The plan describes the method and schedule for keeping the plan current (monitoring, evaluating, and updating the mitigation plan within a five-year cycle).
Requirement 44 CFR § 201.6(c)(4)(j) The plan describes the process that will be followed to track the progress/status of the mitigation actions identified within the Mitigation Strategy, along with when this process will occur and who will be responsible.
Requirement 44 CFR § 201.6(c)(4)(j) The plan describes the process that will be followed to evaluate the plan for effectiveness. This process must identify the criteria that will be used to evaluate the information in the plan, along with when this process will occur and who will be responsible.
Requirement 44 CFR § 201.6(c)(4)(j) The plan describes the process that will be followed to update the plan, along with when this process will occur and who will be responsible for the process.
Requirement 44 CFR § 201.6(c)(4)(ii) The plan describes the process by which each community will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate.

In developing the 2025 HMAP, the participating jurisdictions are also committing to a formal plan maintenance process. The purpose is to ensure the 2025 HMAP remains an active, viable document, and that the mitigation strategies it sets forth are updated and tracked. As mentioned in Section 2, the HMAP is the result of a collaborative process involving executive planning team members, advisory planning team members, stakeholders, and the general public. These bodies will continue to play a role in HMAP maintenance, which includes efforts by each participating jurisdiction to:

- ✓ Monitor, evaluate, and update the content in the HMAP.
- ✓ Codify annual mitigation actions and capability assessment updates.
- ✓ Incorporate the requirements of the HMAP into existing planning mechanisms.
- ✓ Continue to engage communities by including the public in the plan maintenance process through public information meetings, town halls, surveys, questionnaires, and/or public outreach.
- ✓ Document progress and address challenges.

Evaluation of Progress

To maintain this momentum and to build on previous HMAP successes, the planning team will convene once per year as a primary method of monitoring, evaluating, and updating the HMAP. The planning team will evaluate the effectiveness of the HMAP using an iterative and open criterion that includes documenting and summarizing any emerging research or evidence regarding the hazard environment, hazard profiles, or mitigation strategies, and will also incorporate their findings into the HMAP. These updates will be tracked in the Amendment Log.

As part of the annual review process, the planning team will organize a mitigation actions discussion with departments and organizations identified as responsible for mitigation actions or projects. These departments and personnel will be requested to describe their ability to expand and improve their identified capabilities to achieve their mitigation actions and strategies. Meeting and discussion summaries will be tracked and added to Appendix B (planning process documentation). Mitigation action project progress will be tracked in the Amendment Log, or a similar tracking mechanism more suitable to the needs of the participating jurisdiction. The planning team will regularly monitor project completion through site visits, as applicable, and participate in meetings with planning partners and stakeholders to ensure that the participating jurisdictions integrate hazard mitigation into future planning activities. Following HMAP approval and adoption, the planning team will work to incorporate the HMAP into other planning mechanisms, where applicable and appropriate. This may include:

- ✓ Updating work plans, policies, or procedures to include hazard mitigation concepts.
- ✓ Establishing mitigation funding within capital and operational budgets.
- ✓ Developing guidance on risk-reduction techniques.
- ✓ Issuing plans, policies, regulations, or other directives to carry out mitigation actions.
- ✓ Adding hazard mitigation elements to redevelopment, capital, and comprehensive plans.

Section 2 describes methods of incorporating hazard mitigation actions into planning mechanisms. Designated personnel will ensure this process occurs as well as plan monitoring, evaluating, and updating. Responsible personnel will identify appropriate methods and levels of public engagement and participation at each stage of planning.

TABLE 9-1. *Designated Personnel*

JURISDICTION	Oversee Incorporation of HMAP into Other Planning Mechanisms	Responsible for Plan Monitoring, Evaluating, Updating, and Review
Brown County	Emergency Management Coordinator	Emergency Management Coordinator
Bangs	City Secretary	City Secretary
Blanket	City Secretary	City Secretary
Brookesmith ISD	Assistant Superintendent	Assistant Superintendent
Brownwood	Emergency Management Coordinator	Emergency Management Coordinator
Early	Police Chief	Police Chief

Changes in Development, New Disasters, and Impacts to Risk

All developments related to hazards, risks, capabilities, and disaster events will be evaluated by the planning team in a timely manner. The planning team will not delay addressing new hazard mitigation needs until annual reviews. At any time, minor technical changes may be made to update the HMAP. Material changes to mitigation actions or major changes in the overall direction of the HMAP or the policies contained within it, must be subject to formal adoption by the participating jurisdictions. In determining whether to recommend approval or denial of a Plan amendment request, participating jurisdictions will consider the following factors:

- ✓ Errors or omissions made in the identification of issues or needs during the preparation of the HMAP.
- ✓ New issues or needs that were not adequately addressed in the HMAP.
- ✓ Changes in information, data, or assumptions from those on which the HMAP was based.

Factors that may affect the content of the HMAP include new development in identified hazard areas, increased exposure to 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 the 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. Reviewing planning grant options in advance of the five-year HMAP deadline is recommended considering that timelines for grant and planning cycles can be lengthy. Following annual HMAP reviews, any revisions deemed necessary will be summarized and implemented according to the reporting procedures and HMAP amendment process outlined herein. Upon completion of the review, update, and amendment process the revised HMAP will be submitted to TDEM for final review and approval in coordination with FEMA.

Plan Maintenance Schedule

TABLE 9-2. *Estimated HMAP Maintenance Schedule*

MILESTONE	DESCRIPTION	PARTICIPANTS	TIMEFRAME
Adoption	Adoption by all participating jurisdictions and official release of the HMAP.	Planning Team	Spring 2025
Site Visits	Site visit to mitigation action projects to review progress and lessons learned.	Planning Team	Winter 2025
Evaluation	Reconvene the planning team to monitor, evaluate, and update the content of the HMAP.	Planning Team	Winter 2025
Revision/ Update	Reconvene all planning partners that maintain entries in the mitigation action plan to review and update actions and capabilities.	Planning Team / Partners	Spring 2026
Site Visits	Site visit to mitigation action projects to review progress and lessons learned.	Planning Team	Winter 2026
Evaluation	Reconvene the planning team to monitor, evaluate, and update the content of the HMAP.	Planning Team	Winter 2026
Revision/ Update	Reconvene all planning partners that maintain entries in the mitigation action plan to review and update actions and capabilities.	Planning Team / Partners	Spring 2027
Site Visits	Site visit to mitigation action projects to review progress and lessons learned.	Planning Team	Winter 2027
Evaluation	Reconvene the planning team to monitor, evaluate, and update the content of the HMAP.	Planning Team	Winter 2027
Revision/ Update	Reconvene all planning partners that maintain entries in the mitigation action plan to review and update actions and capabilities.	Planning Team / Partners	Spring 2028
Planning Cycle	Reconvene planning team and partners to begin 2030 HMAP update. Coordinate risk assessments, workshops, site visits, surveys, and content review process.	Planning Team / Partners	Fall 2028
Submission	Submission to TDEM and FEMA.	Planning Team	Winter 2029
Adoption	Adoption by all participating jurisdictions and official release of the HMAP.	Planning Team	Spring 2030

APPENDICES

APPENDIX A: Data and Reports

RISK ASSESSMENT

The jurisdictional risk assessment was a mixed methods survey design that provided key personnel, stakeholders, and other participants with the opportunity to provide quantitative and qualitative responses to questions related to hazards, economic impact, human impact, likelihood, effects of climate change, NFIP, critical infrastructure/key resources, disaster financing, energy/water conservation activities, volunteer response programs, and preferred mitigation strategies. The data from these surveys was analyzed and presented by jurisdiction and hazard type in Section 4, Risk Summary.

THIRA

The regional 2023 and 2024 WCTCOG Threat and Hazard Identification and Risk Assessment (THIRA) and Stakeholder Preparedness Review (SPR) were utilized as a tool for the development of this HMAP. The SPR contains a comprehensive capability assessment of 32 core capabilities. The THIRA consists of a three-step process consistent with the guidelines described in the Comprehensive Preparedness Guide 201, 3rd Edition. The steps included identification of threats and hazards; description of context assigned to the identified threats and hazards; and establishment of capability targets. The 2023 WCTCOG THIRA was incorporated into this HMAP when applicable and this HMAP will be incorporated into future THIRA planning and development.

The top three core capabilities to sustain identified by regional stakeholders in 2023 included public health, healthcare, and emergency medical services; mass care; and operational coordination. The top three core capabilities to build identified by regional stakeholders in 2023 included operational communications; infrastructure systems; and public information and warning. The top three core capabilities to sustain identified by regional stakeholders in 2024 included operational coordination; operational communications; and mass care. The top three core capabilities to build identified by regional stakeholders in 2024 included operational communications; infrastructure systems; and public information and warning.

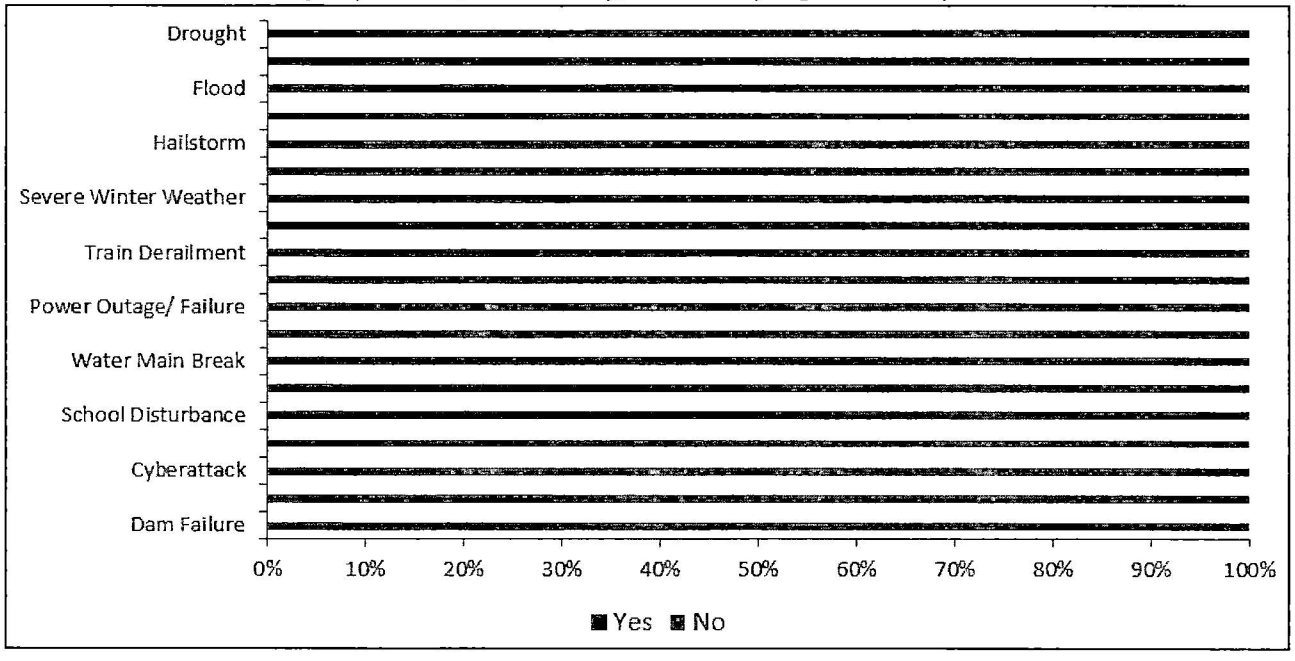
Public Survey

The jurisdictional public survey was a mixed methods survey design that provided the public with the opportunity to provide insight through quantitative and qualitative data related to hazard mitigation awareness, previous experience with disasters, community and personal preparedness, flood insurance, and preferred allocation of resources for hazard mitigation projects. When asked if they felt their community was adequately prepared for hazards or threats, the findings varied depending on the hazard.

Results

Approximately 75% of the respondents stated they were not previously aware of the county's hazard mitigation plan and have experienced or been impacted by a disaster in the last five years (primarily drought, extreme heat, and severe winter weather were reported). Respondents reported only one additional concern that was not addressed by the planning team and will not be incorporated into the HMAP (effects of immigration). Approximately 20% of respondents reported that their homeowner's insurance coverage was inadequate. Nearly 80% reported they do not live in a flood plain and do not have flood insurance. Approximately 5% reported they live in a flood plain but do not have flood insurance. Over 80% reported they did not receive information on the risk of hazard events and the effect that these events could have when selecting their current home. 75% stated they have personally taken actions to make their home or community more resistant to hazards. 45% of respondents prefer their local government to spend money on the emergency services category of mitigation activities, 20% on prevention/local plans/regulations, and 20% on infrastructure projects.

FIGURE A-1. *Perceived Level of Preparedness, Brown County, Public Survey August 2024– September 2024*



WILDFIRE RISK

FIGURE A-2. *Brown County Wildfire Risk, WildfireRisk.org, 20241101*

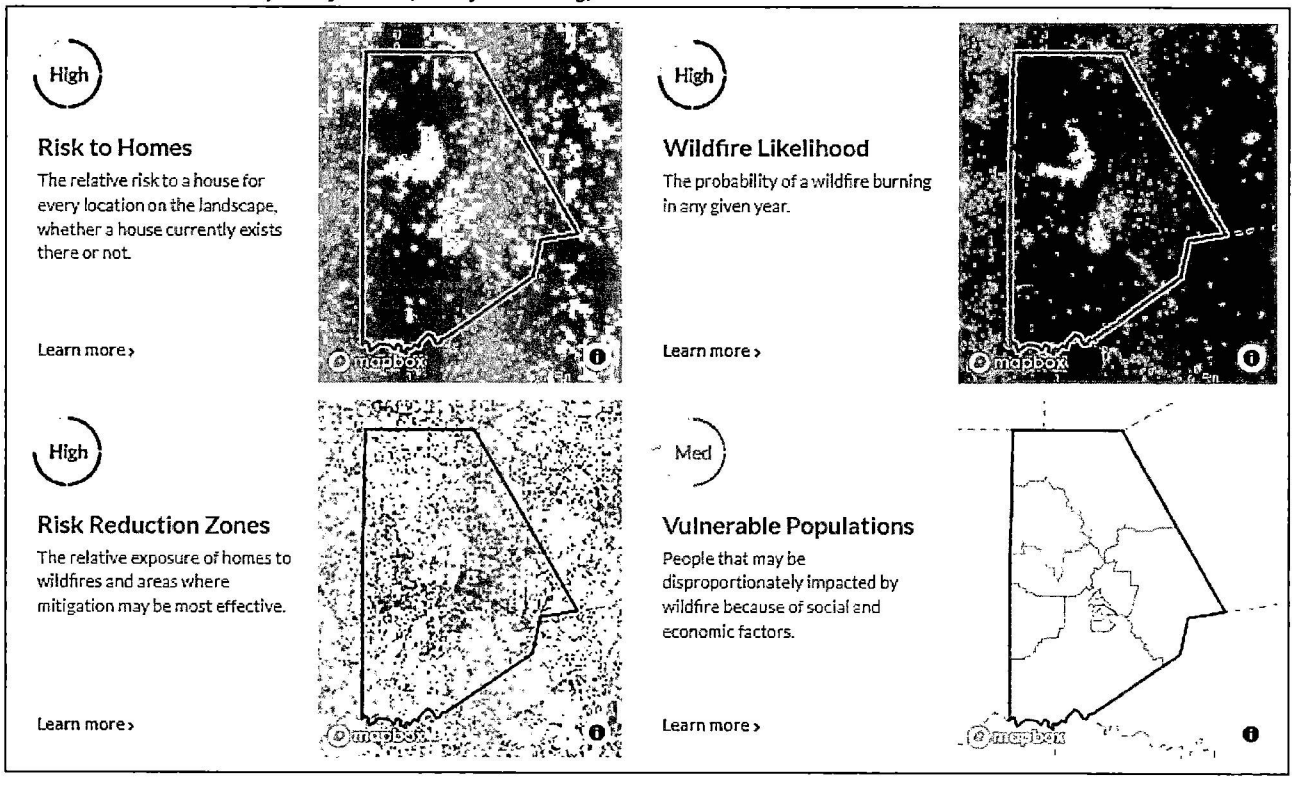


FIGURE A-3. *WCTCOG Dam Safety Program Report, TCEQ, 2024*

TX Num	Dam Name	County	Latitude	Longitude	Hazard	Condition	Overall Owner Status	EAP	COG	CITY
TX01399	LAKEWOOD RESERVOIR DAM	EASTLAND	32.101013	-99.062452	HIGH	POOR	PRIVATE	NO	WCTCOG	
TX01409	WILLIAMSON DAM	EASTLAND	32.439444	-98.984444	HIGH	POOR	PUBLIC	YES	WCTCOG	
TX01410	RINGLING LAKE DAM	EASTLAND	32.424157	-98.829076	HIGH	POOR	PUBLIC	YES	WCTCOG	
TX01411	LAKE EASTLAND DAM	EASTLAND	32.416413	-98.832585	HIGH	FAIR	PUBLIC	YES	WCTCOG	
TX01412	BIRDSONG LAKE DAM	EASTLAND	32.252447	-98.620039	SIGNIFICANT	FAIR	PRIVATE	YES	WCTCOG	
TX01413	PERRIN LAKE DAM	EASTLAND	32.346757	-98.603101	HIGH	FAIR	PRIVATE	YES	WCTCOG	
TX01417	LAKE LEON DAM	EASTLAND	32.362719	-98.675622	HIGH	FAIR	PUBLIC	YES	WCTCOG	
TX01418	HAGAMAN LAKE DAM	EASTLAND	32.496870	-98.651762	SIGNIFICANT	FAIR	PRIVATE	YES	WCTCOG	
TX01427	LAKE BENJAMIN DAM	KNOX	33.564350	-99.797874	SIGNIFICANT	POOR	PUBLIC	YES	WCTCOG	
TX01691	CHAMPION CREEK DAM	MITCHELL	32.280546	-100.858547	HIGH	FAIR		YES	WCTCOG	
TX01693	LAKE COLORADO CITY DAM	MITCHELL	32.318752	-100.918837	HIGH	FAIR	PRIVATE	YES	WCTCOG	
TX01694	BARBER RESERVOIR DAM	MITCHELL	32.419322	-100.905962	HIGH	FAIR	PUBLIC	YES	WCTCOG	
TX02148	UPPER PECAN BAYOU WS SCS SITE 24 DAM	COLEMAN	32.036808	-99.262190	SIGNIFICANT	FAIR	PUBLIC	NO	WCTCOG	
TX02152	COLEMAN DAM	COLEMAN	32.031416	-99.465150	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX02155	JIM NED CREEK WS SCS SITE 10 DAM	COLEMAN	32.050013	-99.468335	HIGH	GOOD	PUBLIC	NO	WCTCOG	
TX02164	HOME CREEK WS SCS SITE 22 DAM	COLEMAN	31.486527	-99.323226	HIGH	GOOD	PUBLIC	NO	WCTCOG	
TX02165	MUKEWATER CREEK WS SCS SITE 10A DAM	COLEMAN	31.650954	-99.225349	HIGH	FAIR	PUBLIC	NO	WCTCOG	
TX02174	NORTHWEST LATERALS WS SCS SITE 20 DAM	COLEMAN	31.577995	-99.466659	SIGNIFICANT	FAIR	PUBLIC	NO	WCTCOG	
TX02183	HOME CREEK WS SCS SITE 15 DAM	COLEMAN	31.642291	-99.353467	HIGH	FAIR	PUBLIC	NO	WCTCOG	
TX02197	HOME CREEK WS SCS SITE 1B DAM	COLEMAN	31.736605	-99.552481	SIGNIFICANT	FAIR	PUBLIC	NO	WCTCOG	
TX02206	JIM NED CREEK WS SCS SITE 36 DAM	COLEMAN	31.871604	-99.518330	HIGH	GOOD	PUBLIC	NO	WCTCOG	
TX02209	HOME CREEK WS SCS SITE 2 DAM	COLEMAN	31.768969	-99.571024	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX02216	JIM NED CREEK WS SCS SITE 35 DAM	COLEMAN	31.879984	-99.537603	HIGH	FAIR	PUBLIC	NO	WCTCOG	
TX02227	HOME CREEK WS SCS SITE 5 DAM	COLEMAN	31.776455	-99.485532	HIGH	GOOD	PUBLIC	NO	WCTCOG	
TX02229	JIM NED CREEK WS SCS SITE 38A DAM	COLEMAN	31.820015	-99.442360	HIGH	GOOD	PUBLIC	YES	WCTCOG	Coleman
TX02234	JIM NED CREEK WS SCS SITE 25A DAM	COLEMAN	31.909048	-99.474819	HIGH	FAIR	PUBLIC	NO	WCTCOG	
TX02235	LAKE SCARBOROUGH DAM	COLEMAN	31.892528	-99.440136	SIGNIFICANT	POOR	PUBLIC	YES	WCTCOG	
TX02239	JIM NED CREEK WS SCS SITE 25 DAM	COLEMAN	31.913672	-99.353853	SIGNIFICANT	FAIR	PUBLIC	NO	WCTCOG	
TX02240	JIM NED CREEK WS SCS SITE 27 DAM	COLEMAN	31.827361	-99.232035	HIGH	FAIR	PUBLIC	NO	WCTCOG	
TX02483	FORT PHANTOM HILL DAM	JONES	32.616970	-99.668445	HIGH	FAIR	PUBLIC	YES	WCTCOG	Abilene
TX02484	ANSON NORTH LAKE DAM	JONES	32.857921	-99.902281	HIGH	FAIR	PUBLIC	YES	WCTCOG	
TX02489	SOUTH LAKE DAM	JONES	32.820537	-100.085258	HIGH	POOR	PUBLIC	YES	WCTCOG	
TX02673	VALLEY CREEK WS SCS SITE 3 DAM	TAYLOR	32.108612	-100.146686	HIGH	FAIR	PUBLIC	YES	WCTCOG	
TX02674	VALLEY CREEK WS SCS SITE 9 DAM	TAYLOR	32.173752	-100.127034	HIGH	FAIR	PUBLIC	YES	WCTCOG	
TX02677	VALLEY CREEK WS SCS SITE 10 DAM	TAYLOR	32.203538	-100.103435	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX02680	VALLEY CREEK WS SCS SITE 13A DAM	TAYLOR	32.154919	-100.098299	SIGNIFICANT	FAIR	PUBLIC	YES	WCTCOG	
TX02681	VALLEY CREEK WS SCS SITE 11 DAM	TAYLOR	32.187989	-100.097245	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX02685	JIM NED CREEK WS SCS SITE 17 DAM	TAYLOR	32.235043	-99.724340	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX02686	JIM NED CREEK WS SCS SITE 16 DAM	TAYLOR	32.226031	-99.717859	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX02687	JIM NED CREEK WS SCS SITE 15 DAM	TAYLOR	32.201600	-99.693790	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX02691	LAKE BULGER DAM	TAYLOR	32.162427	-99.884056	HIGH	POOR	PRIVATE	NO	WCTCOG	
TX02692	LAKE ABILENE DAM	TAYLOR	32.234342	-99.888967	HIGH	FAIR	PUBLIC	YES	WCTCOG	
TX02698	WOODROW GRIFFITH LAKE DAM	TAYLOR	32.469821	-99.698648	HIGH	FAIR	PRIVATE	YES	WCTCOG	Abilene
TX02701	ZOO LAKE NO 1 DAM	TAYLOR	32.441363	-99.693994	HIGH	POOR	PUBLIC	YES	WCTCOG	Abilene
TX02703	LAKE KIRBY DAM	TAYLOR	32.385463	-99.728188	HIGH	GOOD	PUBLIC	YES	WCTCOG	Abilene
TX02705	LYTLE LAKE DAM	TAYLOR	32.434730	-99.708255	HIGH	POOR	PUBLIC	YES	WCTCOG	Abilene
TX02727	VALLEY CREEK WS SCS SITE 1 DAM	NOLAN	32.100555	-100.167425	HIGH	GOOD	PUBLIC	YES	WCTCOG	

FIGURE A-3, CONTINUED. *WCTCOG Dam Safety Program Report, TCEQ, 2024*

TX Num	Dam Name	County	Latitude	Longitude	Hazard	Condition	Overall Owner Status	EAP	COG	City
TX02728	VALLEY CREEK WS SCS SITE 4A DAM	NOLAN	32.191461	-100.206528	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX02729	VALLEY CREEK WS SCS SITE 5 DAM	NOLAN	32.201434	-100.179805	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX02730	VALLEY CREEK WS SCS SITE 6 DAM	NOLAN	32.199725	-100.175234	SIGNIFICANT	GOOD	PUBLIC	NO	WCTCOG	
TX02733	LAKE TRAMMEL DAM	NOLAN	32.362944	-100.436197	HIGH	FAIR	PUBLIC	YES	WCTCOG	
TX02734	SWEETWATER COUNTRY CLUB LAKE DAM	NOLAN	32.498541	-100.388531	HIGH	POOR	PRIVATE	YES	WCTCOG	
TX02735	LAKE SWEETWATER DAM	NOLAN	32.439101	-100.306145	HIGH	FAIR	PUBLIC	YES	WCTCOG	
TX02737	UPPER PECAN BAYOU WS SCS SITE 34 DAM	BROWN	32.050926	-99.116196	SIGNIFICANT	POOR	PUBLIC	YES	WCTCOG	
TX02740	UPPER PECAN BAYOU WS SCS SITE 26 DAM	BROWN	32.052166	-99.133048	SIGNIFICANT	FAIR	PUBLIC	YES	WCTCOG	
TX02743	CLEAR CREEK WS SCS SITE 1 DAM	BROWN	31.575022	-99.124885	HIGH	FAIR	PUBLIC	YES	WCTCOG	
TX02745	CLEAR CREEK WS SCS SITE 6 DAM	BROWN	31.611346	-99.085762	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX02748	CLEAR CREEK WS SCS SITE 3 DAM	BROWN	31.594904	-99.142206	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX02749	CLEAR CREEK WS SCS SITE 2 DAM	BROWN	31.586033	-99.156211	SIGNIFICANT	GOOD	PUBLIC	YES	WCTCOG	
TX02750	CLEAR CREEK WS SCS SITE 4 DAM	BROWN	31.632787	-99.140329	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX02752	BROWNWOOD LATERALS WS SCS SITE 3 DAM	BROWN	31.677849	-99.009583	HIGH	FAIR	PUBLIC	YES	WCTCOG	
TX02754	BLANKET CREEK WS SCS SITE 15 DAM	BROWN	31.707541	-98.734657	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX02755	BROWNWOOD LATERALS WS SCS SITE 21 DAM	BROWN	31.717999	-98.837101	HIGH	FAIR	PUBLIC	NO	WCTCOG	
TX02758	BROWNWOOD COUNTRY CLUB LAKE DAM	BROWN	31.653636	-98.992938	HIGH	FAIR	PRIVATE	NO	WCTCOG	
TX02765	BLANKET CREEK WS SCS SITE 9 DAM	BROWN	31.712364	-98.779429	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX02770	BLANKET CREEK WS SCS SITE 7 DAM	BROWN	31.772746	-98.798431	SIGNIFICANT	FAIR	PUBLIC	YES	WCTCOG	
TX02771	BLANKET CREEK WS SCS SITE 6 DAM	BROWN	31.785166	-98.796928	SIGNIFICANT	FAIR	PUBLIC	YES	WCTCOG	
TX02772	BLANKET CREEK WS SCS SITE 4 DAM	BROWN	31.841358	-98.802041	HIGH	POOR	PUBLIC	YES	WCTCOG	
TX02773	BLANKET CREEK WS SCS SITE 3 DAM	BROWN	31.843891	-98.796161	HIGH	POOR	PUBLIC	YES	WCTCOG	
TX02774	BLANKET CREEK WS SCS SITE 1 DAM	BROWN	31.867402	-98.793853	HIGH	FAIR	PUBLIC	YES	WCTCOG	
TX02775	BROWNWOOD LATERALS WS SCS SITE 20 DAM	BROWN	31.751667	-98.846667	SIGNIFICANT	FAIR	PUBLIC	YES	WCTCOG	
TX02776	BROWNWOOD LATERALS WS SCS SITE 13 DAM	BROWN	31.861720	-98.848054	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX02777	BROWNWOOD LATERALS WS SCS SITE 15 DAM	BROWN	31.844785	-98.858210	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX02779	BROWNWOOD LATERALS WS SCS SITE 19 DAM	BROWN	31.759197	-98.870112	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX02781	BROWNWOOD LATERALS WS SCS SITE 16A DAM	BROWN	31.828189	-98.888653	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX02782	BROWNWOOD LATERALS WS SCS SITE 17 DAM	BROWN	31.797307	-98.921553	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX02783	BROWNWOOD LATERALS WS SCS SITE 11 DAM	BROWN	31.865454	-98.895754	HIGH	FAIR	PUBLIC	YES	WCTCOG	
TX02784	BROWNWOOD LATERALS WS SCS SITE 10A DAM	BROWN	31.883266	-98.918285	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX02785	UPPER PECAN BAYOU WS SCS SITE 32 DAM	BROWN	31.954908	-98.906588	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX02786	UPPER PECAN BAYOU WS SCS SITE 31 DAM	BROWN	31.969384	-98.900442	HIGH	FAIR	PUBLIC	YES	WCTCOG	
TX02787	BROWNWOOD LATERALS WS SCS SITE 6 DAM	BROWN	31.923358	-98.914588	SIGNIFICANT	GOOD	PUBLIC	YES	WCTCOG	
TX02789	LAKE BROWNWOOD DAM	BROWN	31.838438	-99.002679	HIGH	GOOD	PUBLIC	YES	WCTCOG	

FIGURE A-3, CONTINUED. *WCTCOG Dam Safety Program Report, TCEQ, 2024*

TX Num	Dam Name	County	Latitude	Longitude	Hazard	Condition	Overall Owner Status	EAP	COG	CITY
TX02790	BROWNWOOD LATERALS WS SCS SITE 8 DAM	BROWN	31.777622	-99.003224	HIGH	FAIR	PUBLIC	YES	WCTCOG	
TX02921	TURKEY CREEK WS SCS SITE 1B DAM	CALLAHAN	32.195523	-99.242142	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX02922	TURKEY CREEK WS SCS SITE 2 DAM	CALLAHAN	32.206731	-99.238264	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX02923	TURKEY CREEK WS SCS SITE 4 DAM	CALLAHAN	32.236438	-99.208374	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX02924	TURKEY CREEK WS SCS SITE 6 DAM	CALLAHAN	32.178885	-99.194398	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX02925	TURKEY CREEK WS SCS SITE 3 DAM	CALLAHAN	32.195811	-99.223395	HIGH	POOR	PUBLIC	YES	WCTCOG	
TX02927	TURKEY CREEK WS SCS SITE 9 DAM	CALLAHAN	32.148925	-99.164382	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX02928	TURKEY CREEK WS SCS SITE 5 DAM	CALLAHAN	32.216465	-99.189120	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX02933	TURKEY CREEK WS SCS SITE 1A DAM	CALLAHAN	32.209127	-99.266050	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX02938	UPPER PECAN BAYOU WS SCS SITE 1 DAM	CALLAHAN	32.201172	-99.574072	SIGNIFICANT	GOOD	PUBLIC	YES	WCTCOG	
TX02943	MEXIA DAM	CALLAHAN	32.375664	-99.369741	HIGH	POOR	PUBLIC	YES	WCTCOG	
TX02944	BAIRD RAILROAD LAKE DAM	CALLAHAN	32.389256	-99.371648	HIGH	POOR	PUBLIC	YES	WCTCOG	Baird
TX03114	LAKE DE LAFOSSE DAM	SHACKELFORD	32.733200	-99.108467	HIGH	FAIR	PRIVATE	YES	WCTCOG	
TX03117	MCCARTY LAKE DAM	SHACKELFORD	32.658154	-99.359659	HIGH	FAIR	PUBLIC	YES	WCTCOG	
TX03247	BALLINGER CITY LAKE DAM	RUNNELS	31.758989	-100.044854	HIGH	POOR	PUBLIC	YES	WCTCOG	
TX03251	VALLEY CREEK WS SCS SITE 18 DAM	RUNNELS	31.998014	-100.100570	SIGNIFICANT	GOOD	PUBLIC	YES	WCTCOG	
TX03252	VALLEY CREEK WS SCS SITE 19 DAM	RUNNELS	31.952280	-100.081946	SIGNIFICANT	GOOD	PUBLIC	YES	WCTCOG	
TX03253	VALLEY CREEK WS SCS SITE 20 DAM	RUNNELS	31.939108	-100.112804	SIGNIFICANT	GOOD	PUBLIC	YES	WCTCOG	
TX03476	RUSH CREEK WS SCS SITE 9 DAM	COMANCHE	32.024666	-98.661762	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX03487	BLANKET CREEK WS SCS SITE 2A DAM	COMANCHE	31.851783	-98.763317	HIGH	FAIR	PUBLIC	YES	WCTCOG	
TX03489	RUSH CREEK WS SCS SITE 10 DAM	COMANCHE	31.931313	-98.774204	HIGH	FAIR	PUBLIC	YES	WCTCOG	
TX03491	LAKE COMANCHE DAM	COMANCHE	31.819026	-98.578681	HIGH	POOR	PRIVATE	YES	WCTCOG	
TX03492	LAKE EANES DAM	COMANCHE	31.852825	-98.618174	HIGH	POOR	PRIVATE	YES	WCTCOG	
TX03635	GONZALES CREEK DAM	STEPHENS	32.648736	-98.869154	HIGH	FAIR	PUBLIC	YES	WCTCOG	
TX03639	HUBBARD CREEK DAM	STEPHENS	32.830915	-98.966707	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX03778	LAKE STAMFORD DAM	HASKELL	33.076242	-99.562664	SIGNIFICANT	POOR	PUBLIC	YES	WCTCOG	Stamford
TX03803	LAKE WOODSON DAM	THROCKMORTON	33.018722	-99.065658	HIGH	POOR	PUBLIC	NO	WCTCOG	
TX03805	LAKE THROCKMORTON DAM	THROCKMORTON	33.169986	-99.187451	HIGH	FAIR	PUBLIC	YES	WCTCOG	
TX03808	ELM CREEK RESERVOIR DAM	THROCKMORTON	33.223900	-99.363134	SIGNIFICANT	FAIR	PRIVATE	YES	WCTCOG	
TX04138	LAKE JB THOMAS DAM	SCURRY	32.583330	-101.135000	HIGH	FAIR	PUBLIC	YES	WCTCOG	
TX04219	HOME CREEK WS SCS SITE 13 DAM	COLEMAN	31.662167	-99.393081	HIGH	FAIR	PUBLIC	NO	WCTCOG	
TX04220	JIM NED CREEK WS SCS SITE 37 DAM	COLEMAN	31.892187	-99.643225	HIGH	FAIR	PUBLIC	NO	WCTCOG	
TX04305	ANSON SOUTH LAKE DAM	JONES	32.726787	-99.876330	HIGH	POOR	PRIVATE	YES	WCTCOG	
TX04322	UPPER PECAN BAYOU WS SCS SITE 33 DAM	BROWN	31.946681	-98.916584	HIGH	FAIR	PUBLIC	NO	WCTCOG	
TX04323	BROWNWOOD LATERALS WS SCS SITE 22 DAM	BROWN	31.633333	-98.823333	HIGH	FAIR	PUBLIC	YES	WCTCOG	
TX04324	BLANKET CREEK WS SCS SITE 16 DAM	BROWN	31.691667	-98.745000	SIGNIFICANT	FAIR	PUBLIC	YES	WCTCOG	
TX04367	BROWNWOOD LATERALS WS SCS SITE 4A DAM	BROWN	31.642939	-98.969935	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX04368	BROWNWOOD LATERALS WS SCS SITE 4B DAM	BROWN	31.642737	-98.998503	HIGH	FAIR	PUBLIC	YES	WCTCOG	
TX04457	BROWNWOOD LATERALS WS SCS SITE 1 DAM	BROWN	31.747967	-99.012459	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX04505	BROWNWOOD LATERALS WS SCS SITE 2A DAM	BROWN	31.725325	-99.047712	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX04620	BROWNWOOD LATERALS WS SCS SITE 2REV DAM	BROWN	31.710607	-99.024751	HIGH	GOOD	PUBLIC	YES	WCTCOG	

FIGURE A-3, CONTINUED. *WCTCOG Dam Safety Program Report, TCEQ, 2024*

TX Num	Dam Name	County	Latitude	Longitude	Hazard	Condition	Overall Owner Status	EAP	COG	CITY
TX04729	UPPER PECAN BAYOU WS SCS SITE 30 DAM	BROWN	32.034911	-99.024717	SIGNIFICANT	POOR	PUBLIC	YES	WCTCOG	
TX04730	VALLEY CREEK WS SCS SITE 2A DAM	NOLAN	32.121218	-100.161087	SIGNIFICANT	FAIR	PUBLIC	YES	WCTCOG	
TX04890	ZOO LAKE NO 2 DAM	TAYLOR	32.444962	-99.695757	HIGH	POOR	PRIVATE	YES	WCTCOG	Abilene
TX04901	RUSH CREEK WS SCS SITE 2 DAM	COMANCHE	32.080049	-98.826837	SIGNIFICANT	FAIR	PUBLIC	YES	WCTCOG	
TX04956	RUSH CREEK WS SCS SITE 1 DAM	COMANCHE	32.089755	-98.857710	SIGNIFICANT	FAIR	PUBLIC	YES	WCTCOG	
TX05776	ELM CREEK DAM	RUNNELS	31.938777	-99.868756	HIGH	FAIR	PUBLIC	YES	WCTCOG	Winters
TX05952	BALLINGER MUNICIPAL LAKE DAM	RUNNELS	31.730465	-100.040374	HIGH	FAIR	PUBLIC	YES	WCTCOG	
TX06386	SIMON FREESE DAM	COLEMAN	31.500464	-99.667363	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX06420	MITCHELL COUNTY RESERVOIR DAM	MITCHELL	32.240000	-101.105000	SIGNIFICANT	FAIR	PUBLIC	YES	WCTCOG	
TX06464	JOHN T MONTFORD DAM	KENT	33.061526	-101.042090	HIGH	GOOD	PUBLIC	YES	WCTCOG	
TX07065	SALT CREEK DAM NO 2	COMANCHE	31.863304	-98.478863	HIGH	POOR	PRIVATE	YES	WCTCOG	
TX07235	ELM CREEK WS NRCS SITE 3 REV	RUNNELS	32.075898	-99.928892	HIGH	FAIR	PUBLIC	YES	WCTCOG	
TX07368	SNYDER TERMINAL STORAGE RESERVOIR	SCURRY	32.706952	-101.004881	HIGH	FAIR	PUBLIC	YES	WCTCOG	

US CENSUS QUICKFACTS

FIGURE A-4. *US Census QuickFacts, Brown County*

Fact	Note	Brown County
Population estimates, July 1, 2023, (V2023)		38,709
Population estimates base, April 1, 2020, (V2023)		38,092
Population, percent change - April 1, 2020 (estimates base) to July 1, 2023, (V2023)		1.60%
Population, Census, April 1, 2020		38,095
Population, Census, April 1, 2010		38,106
Persons under 5 years, percent		5.50%
Persons under 18 years, percent		20.50%
Persons 65 years and over, percent		21.20%
Female persons, percent		50.40%
White alone, percent		92.00%
Black or African American alone, percent	(a)	4.20%
American Indian and Alaska Native alone, percent	(a)	1.10%
Asian alone, percent	(a)	0.80%
Native Hawaiian and Other Pacific Islander alone, percent	(a)	0.10%
Two or More Races, percent		1.80%
Hispanic or Latino, percent	(b)	22.90%
White alone, not Hispanic or Latino, percent		70.70%
Veterans, 2018-2022		2,562
Foreign born persons, percent, 2018-2022		3.70%
Housing Units, July 1, 2023, (V2023)		19,335
Owner-occupied housing unit rate, 2018-2022		68.30%
Median value of owner-occupied housing units, 2018-2022		$137,900
Median selected monthly owner costs -with a mortgage, 2018-2022		$1,393
Median selected monthly owner costs -without a mortgage, 2018-2022		$486
Median gross rent, 2018-2022		$862
Building Permits, 2023		249
Households, 2018-2022		14,977
Persons per household, 2018-2022		2.43
Living in same house 1 year ago, percent of persons age 1 year+, 2018-2022		83.50%
Language other than English spoken at home, percent of persons age 5 years+, 2018-2022		17.00%
Households with a computer, percent, 2018-2022		92.00%
Households with a broadband Internet subscription, percent, 2018-2022		85.90%
High school graduate or higher, percent of persons age 25 years+, 2018-2022		87.40%
Bachelor's degree or higher, percent of persons age 25 years+, 2018-2022		19.90%
With a disability, under age 65 years, percent, 2018-2022		15.70%
Persons without health insurance, under age 65 years, percent		17.80%
In civilian labor force, total, percent of population age 16 years+, 2018-2022		57.60%
In civilian labor force, female, percent of population age 16 years+, 2018-2022		52.70%
Total accommodation and food services sales, 2017 ($1,000)	(c)	83,220
Total health care and social assistance receipts/revenue, 2017 ($1,000)	(c)	223,981
Total transportation and warehousing receipts/revenue, 2017 ($1,000)	(c)	59,737
Total retail sales, 2017 ($1,000)	(c)	581,517
Total retail sales per capita, 2017	(c)	$15,378

FIGURE A-4, CONTINUED. *US Census QuickFacts, Brown County*

Fact	Note	Brown County
Mean travel time to work (minutes), workers age 16 years+, 2018-2022		18.1
Median household income (in 2022 dollars), 2018-2022		$53,792
Per capita income in past 12 months (in 2022 dollars), 2018-2022		$30,202
Persons in poverty, percent		17.40%
Total employer establishments, 2022		844
Total employment, 2022		13,158
Total annual payroll, 2022 ($1,000)		530,185
Total employment, percent change, 2021-2022		5.40%
Total nonemployer establishments, 2021		2,721
All employer firms, Reference year 2017		693
Men-owned employer firms, Reference year 2017		347
Women-owned employer firms, Reference year 2017		93
Minority-owned employer firms, Reference year 2017	S	
Nonminority-owned employer firms, Reference year 2017		440
Veteran-owned employer firms, Reference year 2017		35
Nonveteran-owned employer firms, Reference year 2017		496
Population per square mile, 2020		40.3
Population per square mile, 2010		40.3
Land area in square miles, 2020		944.45
Land area in square miles, 2010		944.43

Fact Notes

(a)
Includes persons reporting only one race
(b)
Hispanics may be of any race, so also are included in applicable race categories
(c)
Economic Census - Puerto Rico data are not comparable to U.S. Economic Census data

Value Flags

S
Suppressed; does not meet publication standards

APPENDIX B: Planning Process Documentation

MEETING SIGNATURE SHEETS

FIGURE B-1. *Brown County Meeting Sign-In Sheets, 2024*

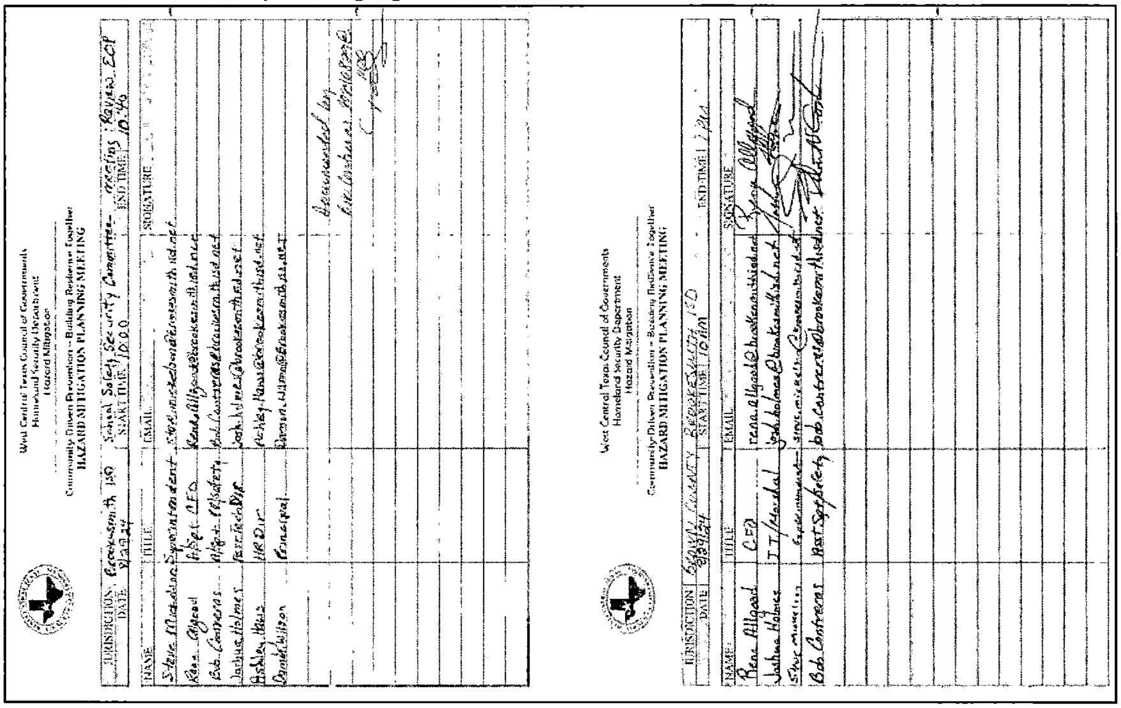
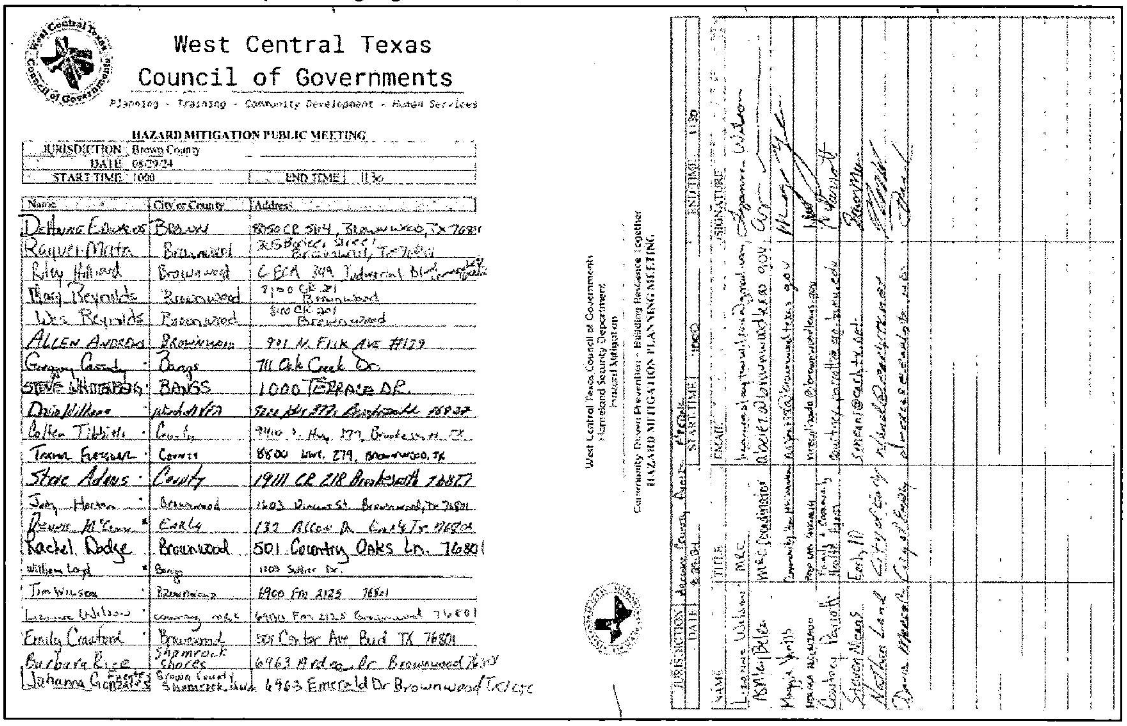


FIGURE B-2. *Brown County Meeting Sign-In Sheets, 2024*



West Central Texas Council of Governments

Planning - Training - Community Development - Human Services

HAZARD MITIGATION PUBLIC MEETING

JURISDICTION: Brown County
DATE: 08/29/24
START TIME: 1000
END TIME: 1130

Name	City or County	Address
DeHuna Edwards	Brown	8050 CR 304, Brownwood, TX 76801
Raquel Mata	Brownwood	315 Baker Street Brownwood, TX 76801
Riley Hilliard	Brownwood	CEDA 349 Industrial Blvd
Mary Reynolds	Brownwood	7150 CR 21 Brownwood
Wes Reynolds	Brownwood	8150 CR 201 Brownwood
ALLEN ANDREWS	BROWNWOOD	901 N. FISK AVE #129
Gregory Cassidy	Bangs	711 Oak Creek Dr.
STEVE WHITAKER	BANGS	1000 TERRACE DR.
Davis Wilkerson	[illegible]	[illegible] Hwy 377 Brookesmith 76827
Colten Tibbitts	County	9410 S. Hwy 377 Brookesmith TX
Tanna Freeman	County	8800 Hwy. 279, Brownwood, TX
Steve Adams	County	1911 CR 218 Brookesmith 76827
Joey Horton	Brownwood	1603 [illegible] St. Brownwood, TX 76801
[illegible] McCann	Early	132 Allcorn Dr Early TX 76802
Rachel Dodge	Brownwood	501 Country Oaks Ln. 76801
William Loyd	Bangs	1103 Sutter Dr.
Tim Wilson	Brownwood	1900 FM 2125 76801
Leanne Wilson	county MCC	6900 FM 2125 Brownwood 76801
Emily Crawford	Brownwood	501 Center Ave Bwd TX 76801
Barbara Rice	Shamrock Shores	6963 [illegible] Dr Brownwood TX
Johanna Gonzales	Brown County Shamrock Shores	6963 Emerald Dr Brownwood TX

FIGURE B-3. *Brown County Meeting Sign-In Sheets, 2024*

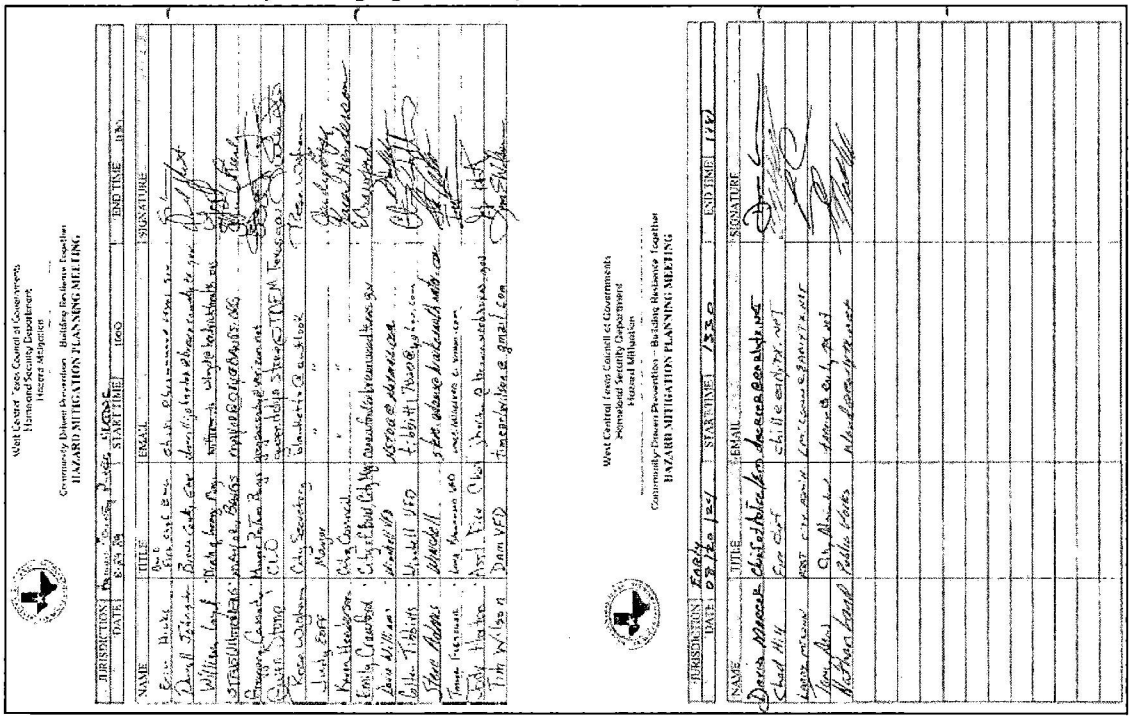


FIGURE B-4. *Brown County Meeting Sign-In Sheets, 2024*

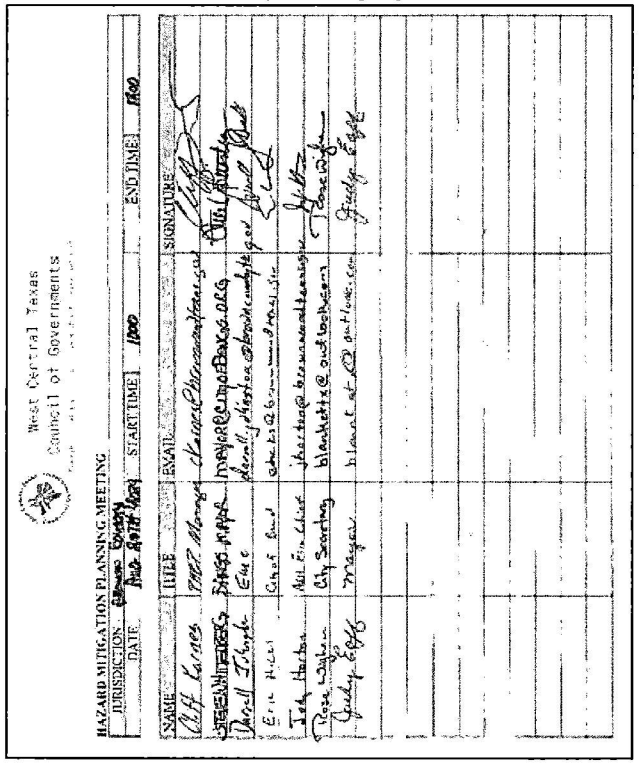


FIGURE B-5. *Brown County Meeting Sign-In Sheets, 2024*

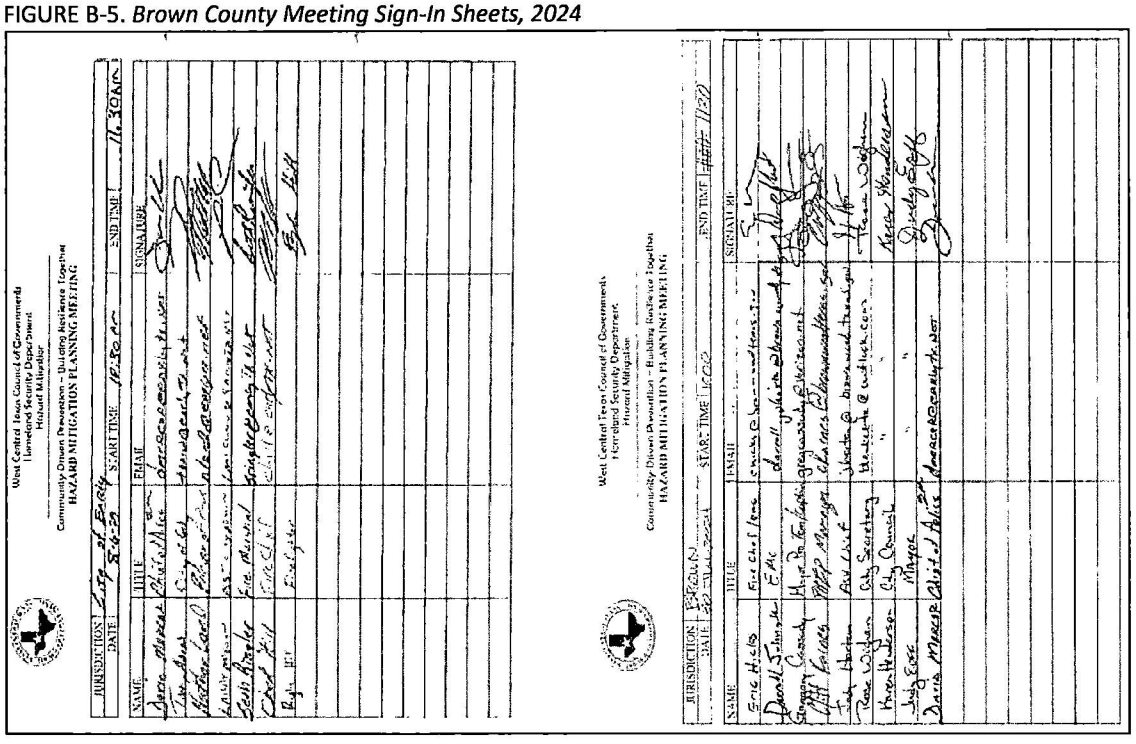
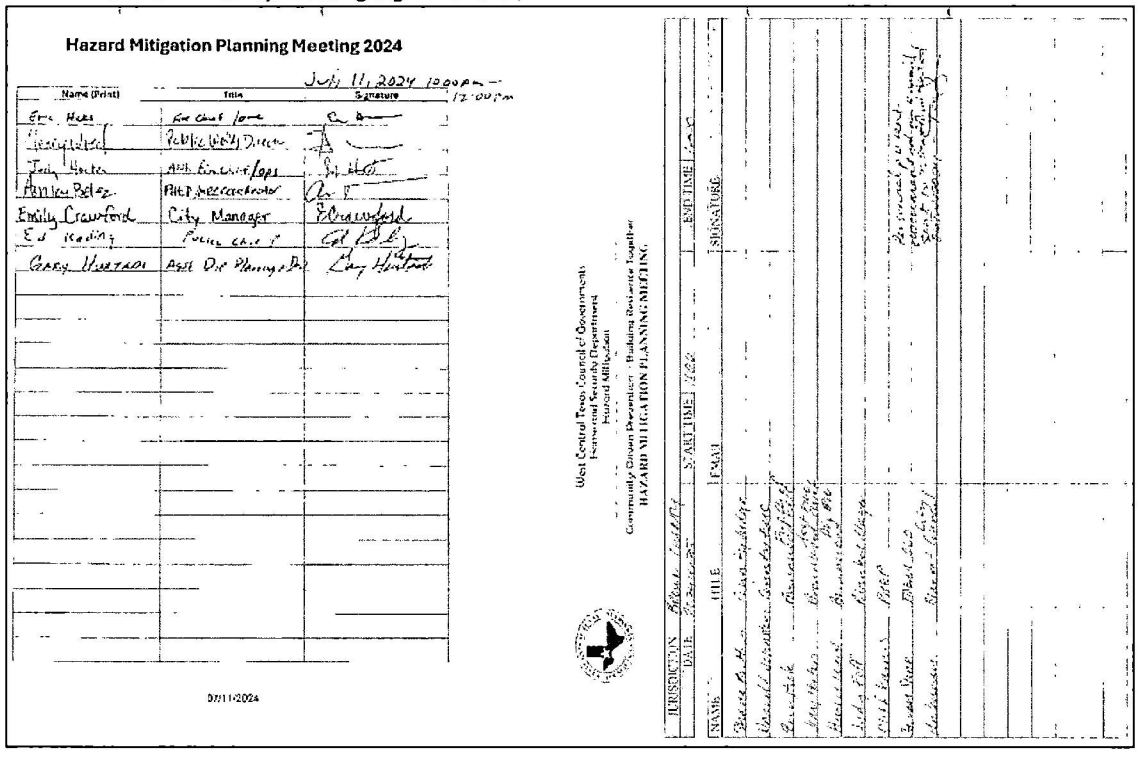


FIGURE B-6. *Brown County Meeting Sign-In Sheets, 2024*



PUBLIC MEETING

FIGURE B-7. *Brown County Notice of Public Meeting (County-Wide)*

NOTICE OF MEETING

HAZARD MITIGATION PLAN PUBLIC MEETING

Notice is hereby given that Judge Britton of Brown County, Texas will hold a JOINT PUBLIC Meeting on Thursday, August 29th, 2024, at 10:00 AM, at the Brownwood Depot and Cultural Center located at 600 E. Depot Street. Brownwood Texas, 76801. The public is invited and encouraged to attend this meeting.

MEETING PURPOSE

The Emergency Managers for Brown County, City of Bangs, City of Blanket, City of Brownwood and the City of Early will make a presentation at a joint public meeting to provide information and gather public input for the Brown County Hazard Mitigation Plan. Public input will help the project team identify and analyze potential hazards affecting residents and recommend possible actions to reduce their impact. Hazards can include floods, tornados, wildfires, winter storms, cyber-attacks and other disasters.

The goal of the Hazard Mitigation Plan is to minimize or eliminate the long-term risk to human life and property from known hazards by identifying and implementing cost-effective mitigation actions. Mitigation is defined by the Federal Emergency Management Agency as sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and other effects.

An online public survey will be available for those unable to attend the meeting.

Questions about the Hazard Mitigation Plan should be directed to Darrell Johnston, Brown County Emergency Manager by email at darrell.johnston@browncounty.tx.gov.

Dated this the 12th day of Aug 2024.

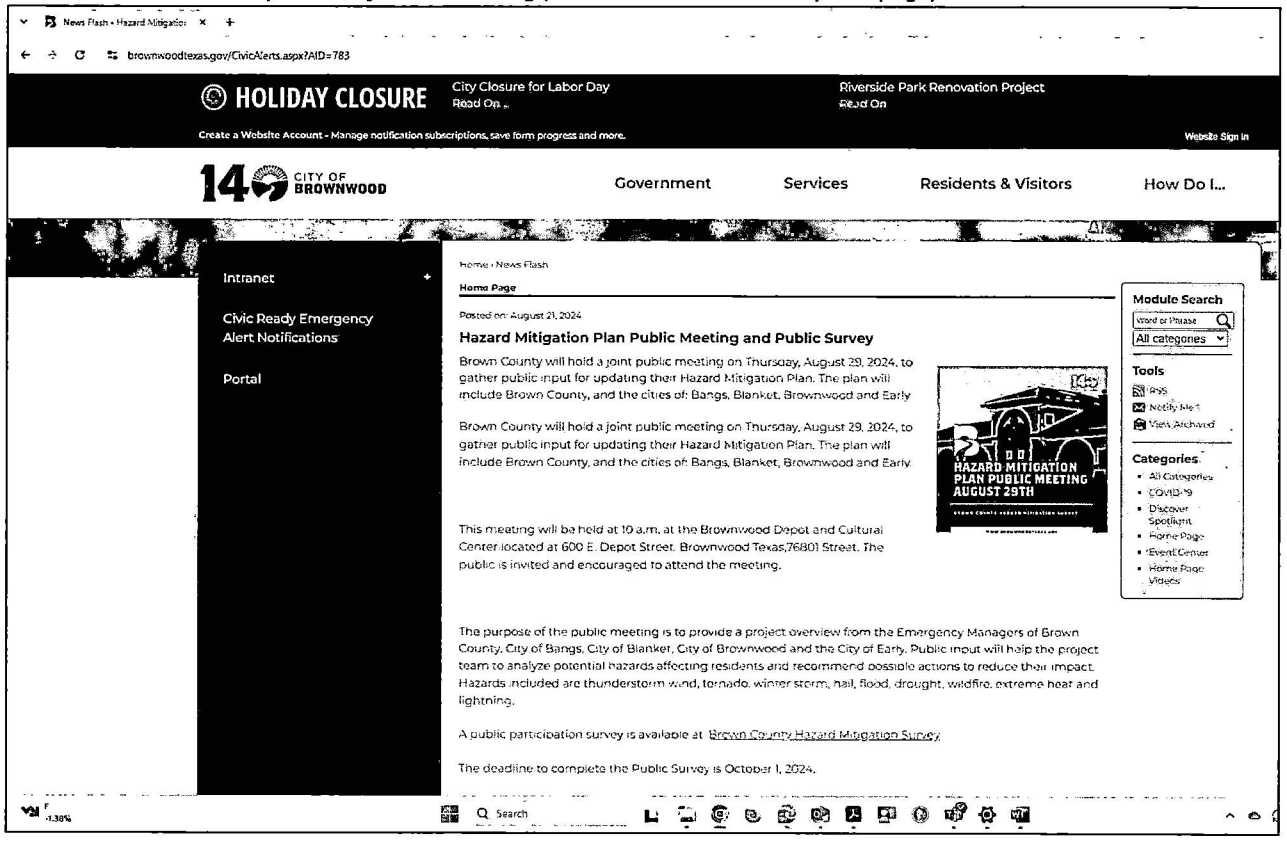
Shane Britton

County Judge, Brown County, Texas

POSTED
Sharon Ferguson, Brown County Clerk
Time 9:23 a.m.
AUG 13 2024
By Deputy

FIGURE B-8. *Brown County Notice of Public Meeting (Posted on Courthouse Public Bulleting Board)*

FIGURE B-9. *Brown County Notice of Public Meeting (Posted on Brownwood City Webpage)*



Public Meeting Images

FIGURE B-10. *Brown County Public Meeting (County-Wide), Brownwood Depot and Cultural Center, 2024*

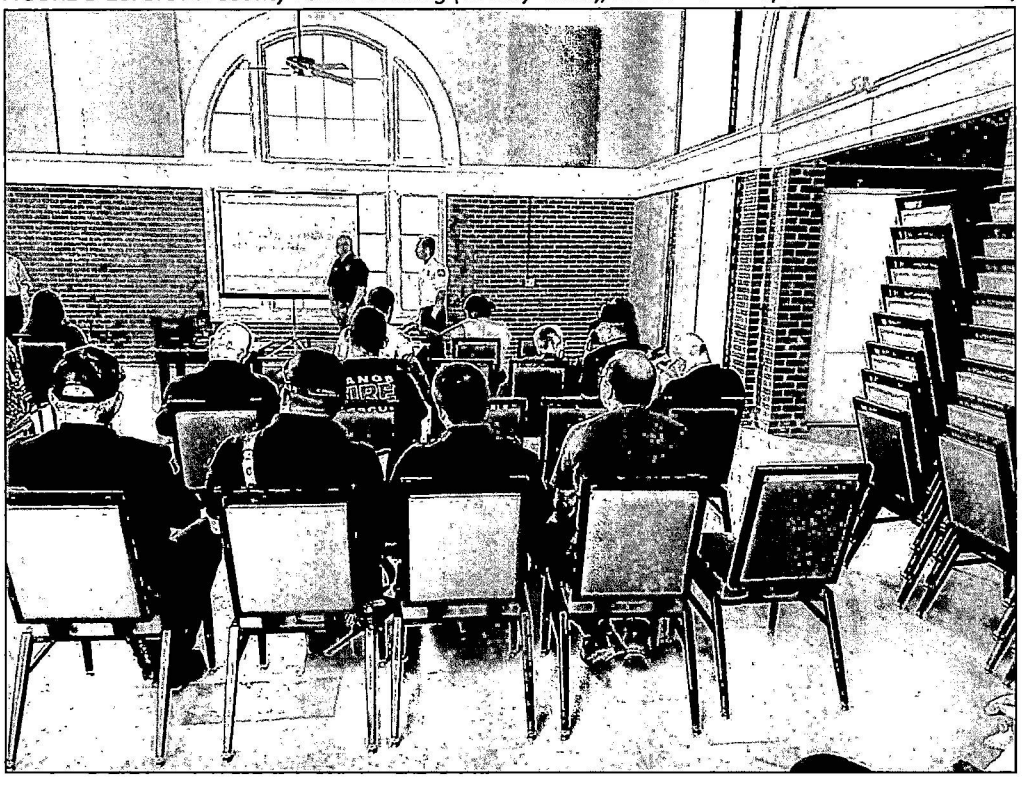
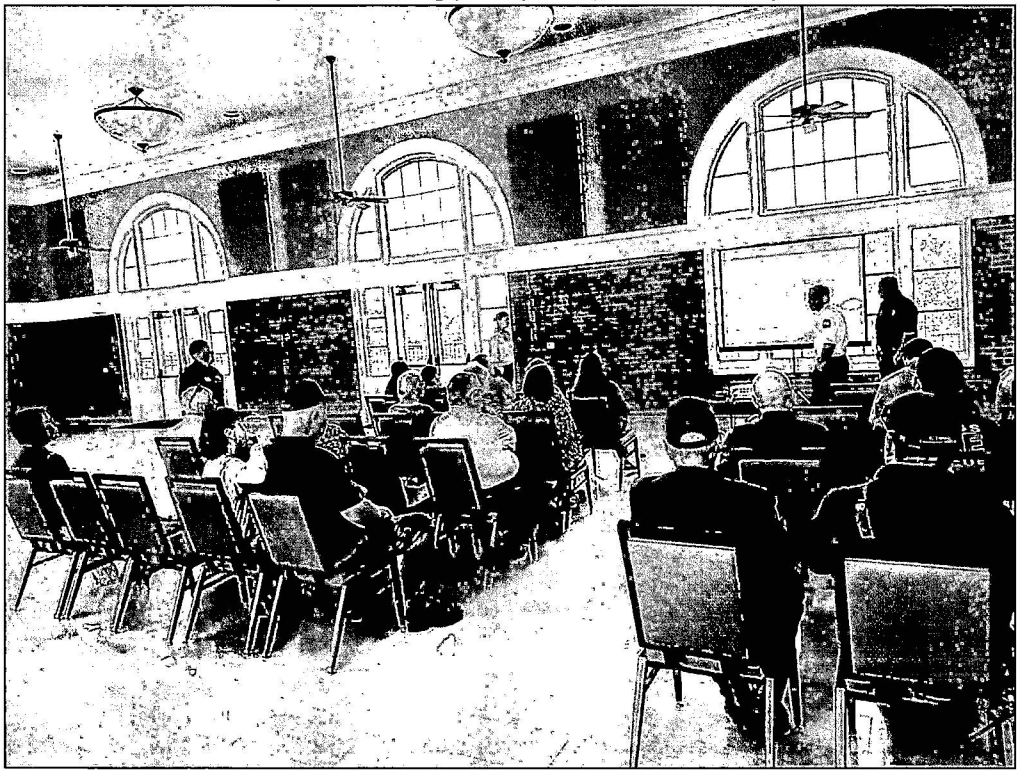


FIGURE B-11. *Brown County Public Meeting (County-Wide), Brownwood Depot and Cultural Center, 2024*



Public Meeting Summary

FIGURE B-12. *Brown County Public Meeting Summary, Brownwood Depot and Cultural Center, 2024*

Notes from Brown County Meeting on Aug 29, 2024, at Train Depot/Cultural Center in Brownwood which began at 1000 and concluded at 1130. There was an attendance of 35 people plus 4 WCTCOG employees. There were 26 team members or City employees/ County employees / Stakeholder/ Volunteer Firefighters, and 9 citizens present for the Public Meeting.

Chief Hicks and Darrell greeted everyone and commenced the meeting. Chief Hicks advised the public about the public survey which is available on city websites. Taryn provided an overview of what Hazard Migration, mandate of having Hazard Mitigation Plan, and processes to write and submit plan.

Darrell discussed Brown County Action Items individually. The following are public comments on the Action Items.

Action Item #1 Public Education - 2 separate citizens made comments

Citizen 1 - Where are you going to put this education out at or on, not everyone has social media. You should send education out by mail, have meetings like this one, Get the community together.

Citizen 2 - Why doesn't the county help us get a Neighborhood watch going.

Ag Life Representative - There is a DART Agent available that can come out and provide training for the community.

Action Item #2 Retrofit Critical Facilities - No public comments were received.

Action Item #3 Community and Residential Safe Rooms - No public comments were received.

Action Item #4 Critical Facility Generators - No public comments were received.

Action Item #5 Storm Siren System - No public comments were received.

Action Item #6 Drains and Culverts - 2 separate citizens made comments

Citizen 3 - How is it the County has insufficient funds to pay for these things. How long does it take to get the grant funds. So, we are relying on a grant to fix normal occurrence items or failed reservoirs. In 1932 the citizens in Brownwood got together and built a dam. We do not need to be citizens dependent on the government. If the city would increase taxes, we could pay of these things ourselves and if the city would stop spending money on their pet projects, we would also have the funds. I guess since you are the ones who made the finance decisions, I will take this to the Commissioners, I have taken may other items before them.

Citizen 1 - With all this water runoff, we need to find a way to keep the water because we may need it someday. Who is responsible for the County Culverts and Drains. Property owners need to be responsible for picking up the trash. It is every one responsibility.

Action Item #7 Wildland Urban Interface - 3 Separate citizens made comments.

Citizen #4 - Who will get the funding and what is the process.

Citizen #1 - People will have to maintain the trees over their trailers/ houses to 10 years, that is a good thing.

Citizen #2 - What about the vacate lots around town that are overgrown, will the county maintain that over the 10-year period.

Fire Chief Hicks discussed City of Brownwood Action Items individually. The following are public comments on the Action Items.

Action Item #1 Stormwater Detention/Retention Basin - No public comments were received.

Action Item #2 Mutual Aid Agreements - No public comments were received.

Action Item #3 Capital Improvement Program Fund - No public comments were received.

Action Item #4 Magnolia Ditch Project - No public comments were received.

Health Department Action Item #5 Training Assessment - No public comments were received.

Health Department Action Item #6 Identification of Vulnerable Populations - No public comments were received.

Health Department Action Item #7 First Responder Health and Safety - No public comments were received.

FIGURE B-12, CONTINUED. *Brown County Public Meeting Summary, Brownwood Depot and Cultural Center, 2024*

Chief Hicks discussed City of Blanket Action Items individually. The following are public comments on the Action Items.
Action Item #1 Automated Water Meters - No public comments were received.
Action Item #2 Water Lines - No public comments were received.

Mayor Whittenberg discussed City of Bangs Action Item. The following are public comments on the Action Items.
Action Item #1 Community Shelter - No public comments were received.

Police Chief Mercer discussed City of Early Action Items individually. The following are public comments on the Action Items.
Action Item #1 Stormwater Detention/Retention Basins - No public comments were received.
Action Item #1 Fire Danger/ Burn Ban Signs - No public comments were received.

Chief Hicks thanked everyone for being in attendance and asked the public if anyone had any other questions or comments.

Citizen #4 - Asked where the public survey can be found. Chief Hicks advised the citizens the public survey can be located on all city websites and the WCTCOG website. It will be available until October 1st and there is a comment section.

Chief Hicks and Darrell concluded the Public meeting by thanking everyone for their attendance.

APPENDIX C: Terminology and References

Acronyms

BOE	Barrels of Oil Equivalent	NA	Not Applicable
BRIC	Building Resilient Infrastructure and Communities	NCEI	National Center for Environmental Information
CAC	Community Assistance Contact	NFIA	National Flood Insurance Act
CAV	Community Assistance Visit	NFIP	National Flood Insurance Program
CDC	U.S. Center for Disease Control and Prevention	NOAA	National Oceanic and Atmospheric Administration
CFR	Code of Federal Regulations	NWS	National Weather Service
CIP	Capital Improvement Plan	NXDN48	Next Generation Digital Narrowband
CRS	Community Rating System	PGA	Peak Ground Acceleration
CWPP	Community Wildfire Protection Plan	POETE	Planning/Organizing/Equipping/Training/Exercising
CISA	Cybersecurity and Infrastructure Security Agency	PPC	Public Protection Classification
DHS	U.S. Department of Homeland Security	PUC	Public Utilities Commission
DMA	Disaster Mitigation Act of 2000	P25	Project 25 (digital radio system standards)
DPS	Texas Department of Public Safety	RAPT	Resilience Analysis and Planning Tool
DSHS	Department of State Health Services	ROE	Report on Environment
EMC	Emergency Management Coordinator	RoIP	Radio over Internet Protocol
EMS	Emergency Medical Service	SFHA	Special Flood Hazard Area
EMT	Emergency Medical Technicians	SFR	Single Family Residence
EOC	Emergency Operations Center	SNS	Strategic National Stockpile
EOP	Emergency Operations Plan	SOP	Standard Operation Procedure
EPA	Environmental Protection Agency	SRL	Severe Repetitive Loss
ERCOT	Electric Reliability Council of Texas	STAPLE+E	Social, Technical, Administrative, Political, Legal, Economic, and Environmental
FEMA	Federal Emergency Management Agency	TCEQ	Texas Commission on Environmental Quality
FMN	Federated Mission Networking	TDEM	Texas Division of Emergency Management
FIRM	Flood Insurance Rate Map	TFS	Texas Forest Service
FM	Frequency Modulation	THIRA	Threat and Hazard Identification and Risk Assessment
MJHMAP	Multi-Jurisdictional Hazard Mitigation Action Plan	FPA	Floodplain Administrator
MPH	Miles per Hour	GIS	Geographic information system

HAZMAT	Hazardous Materials	TxDOT	Texas Department of Transportation
HHPD	High Hazard Potential Dam	TxSSC	Texas School Safety Center
HMA	Hazard Mitigation Assistance	USACE	United States Army Corps of Engineers
HMAP	Hazard Mitigation Action Plan	USDA	U.S. Department of Agriculture
HMGP	Hazard Mitigation Grant Program	USFA	U.S. Fire Administration
HVAC	Heating, Ventilation, and Air Conditioning	USGS	U.S. Geological Survey
ISD	Independent School District	VFD	Volunteer Fire Department
ISO	Insurance Services Office	WCTCOG	West Central Texas Council of Governments
KBDI	Keetch-Byram Drought Index	WSC	Water Supply Corporation
LCRA	Lower Colorado River Authority	WHP	Wildfire Hazard Potential
TWDB	Texas Water Development Board	WUI	Wildland Urban Interface

Definitions

Assets	Community-valued resources, including people, structures, systems, and natural, historic, and cultural resources.
Changes in Development	Recent or potential developments, or conditions affecting risks and vulnerabilities, including policy and regulatory changes.
Climate Change	Long-term changes in average weather conditions, including temperature, precipitation, and severe weather risk.
Community Lifelines	Essential services that enable societal functions, supporting health, safety, and economic security.
Community Resilience	The ability to prepare for, adapt to, and recover from hazards, including disaster preparedness and reducing community stressors.
Discussion	Contextual narrative or materials for a plan section.
Document	Providing factual evidence for plan development or updates.
Evaluating	Assessing the plan's effectiveness in achieving its goals.
Extent	The range of anticipated hazard intensities expressed using scientific scales.
Goals	Broad, long-term policy and vision statements for the mitigation strategy.
Hazard Mitigation	Actions to reduce or eliminate long-term risks to life and property from hazards.
Human Caused Hazards	Harmful events from malicious human actions, such as terrorism and mass violence.
Impacts	Consequences of hazards on assets, including historical damages and potential future losses.
Incorporate	Include other information from other sources in the plan.
Integrate	Embedding hazard mitigation principles and actions into other community planning efforts.
Involvement	Active participation in plan development, providing input and editing content.
Local Government	Various forms of local governance entities, including municipalities, districts, and tribal organizations.
Location	Geographic boundaries or affected assets, illustrated through maps or narratives.

Mitigation Action	Measures to reduce vulnerabilities identified in the risk assessment.
Monitoring	Tracking plan implementation over time.
Natural Hazards	Harmful events from meteorological, environmental, or geological sources.
Participant	Entities developing or updating a local mitigation plan.
Participation	Engaging and providing input on the plan through various means.
Planning Mechanisms	Governance structures for managing community decisions.
Probability of Future Events	Likelihood of hazard occurrence, defined by historical data, statistical probabilities, maps, or general description. Unlikely reflects a low chance of occurrence (not impossible, but odds are against it based on historical data). Likely suggests a good chance of occurrence (not guaranteed, but odds lean toward it). Highly likely suggests an almost certain chance of occurrence (nearly guaranteed).
Repetitive Loss Structure	NFIP-covered property with repeated flood-related damage, meeting specific criteria.
Risk	Potential for injuries, death, damage, or loss from hazards interacting with people or assets.
Severe Repetitive Loss Property	NFIP-covered property with significant flood-related damage, meeting specific criteria.
Social Vulnerability	Potential for loss within a group, influenced by characteristics affecting their ability to handle events, often compounded by infrastructure and policy issues.
Technological Hazards	Harmful events from technology or industry, like accidents or infrastructure failures.
Updating	Reviewing and revisiting the plan at least every five years or as needed.
Vulnerability	Description of assets at risk from identified hazards in hazard-prone areas.

References

arcGIS	https://www.arcgis.com/
Association of State Dam Safety Officials	https://damsafety.org/texas
Augurisk	https://www.augurisk.com/risk/state/texas/
Code of Federal Regulations	https://www.ecfr.gov/current/title-44/chapter-I/subchapter-D/part-201
Cybersecurity and Infrastructure Security Agency	https://www.cisa.gov
Data USA	https://datausa.io/profile/geo/
Federal Energy Regulatory Commission	https://www.ferc.gov/projects
FEMA Building Resilient Infrastructure and Communities	https://www.fema.gov/grants/mitigation/learn/building-resilient-infrastructure-communities
FEMA Disaster Declarations	https://www.fema.gov/data-visualization/disaster-declarations-states-and-counties
FEMA Flood Map Service Center	https://msc.fema.gov/portal/home
FEMA Hazard Mitigation Planning	http://www.fema.gov/hazard-mitigation-planning-resources
FEMA National Risk Index	https://hazards.fema.gov/nri/map
First Street Technology	https://firststreet.org/
National Centers for Environmental Information	https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/county/time-series/TX-

National Integrated Drought Information System	https://www.drought.gov/states/texas/county/scurry
National Inventory of Dams	https://nid.sec.usace.army.mil/#/dams/search/sy=@countyState:Scurry
National League of Cities	https://www.nlc.org/resource/interactive-rail-safety-map-see-derailments-in-communities-across-the-u-s/
National Oceanic and Atmospheric Administration	https://www.noaa.gov/
National Pipeline Mapping System	https://pvnpms.phmsa.dot.gov/PublicViewer/
National Transportation Safety Board	https://www.ntsb.gov/Pages/AviationQueryv2.aspx
National Weather Service	https://www.weather.gov/news/243009-cold-hazard-simplification
Public Utility Commission of Texas	https://www.puc.texas.gov/storm/map.aspx
Radio Reference	https://www.radioreference.com/db/browse/ctid/2722
Southwest Times Record	https://data.swtimes.com/national-power-outage-map-tracker/
Texas A&M Forest Service	https://tfsweb.tamu.edu/
Texas Commission on Environmental Quality	https://www.tceq.texas.gov/
Texas County Information Program	https://txcip.org/tac/census/profile.php?FIPS=48399
Texas Demographic Center	https://demographics.texas.gov/
Texas Department of State Health Services	https://www.dshs.texas.gov/notifiable-conditions/disease-surveillance
Texas Division of Emergency Management	https://tdem.texas.gov/mitigation/hazard-mitigation-section
Texas Water Development Board	https://www.twdb.texas.gov/
Tornado and Storm Research Organization	https://www.torro.org.uk/research/hail/hscale
U.S. Army Corps of Engineers	https://www.usace.army.mil/
U.S. Census Bureau	https://data.census.gov/
U.S. County Maps	https://uscountymaps.com/scurry-county-map-texas/
U.S. Department of Transportation	https://www.transportation.gov/sites/dot.gov/files/2022-02/USDOT-National-Roadway-Safety-Strategy.pdf
U.S. Fire Administration	https://www.usfa.fema.gov/index.html
U.S. Geological Survey	https://earthquake.usgs.gov/
Wildfire Risk	https://wildfirerisk.org/explore/

APPENDIX D: Capability Assessment Tool for Plan Integration

PLANNING AND REGULATORY	
Plans	Does the plan address hazards? Can the plan be used to implement mitigation actions? When was it last updated?
Capital Improvements Plan	
Climate Change Adaptation Plan	
Community Wildfire Protection Plan	
Comprehensive/Master Plan	
Continuity of Operations Plan	
Economic Development Plan	
Land Use Plan	
Local Emergency Operations Plan	
Stormwater Management Plan	
Transportation Plan	
Other (describe)	
Land Use Planning and Ordinances	Is the ordinance an effective measure for reducing hazard impacts? Is it adequately administered and enforced?
Land Acquisition for Open Space/Recreation Use	
Building Code	
Flood Insurance Rate Maps	
Floodplain Ordinance	
Substantial Damage Plan	
Natural Hazard Specific Ordinance	
Subdivision Ordinance	
Zoning Ordinance	
Other	
ADMINISTRATIVE AND TECHNICAL	
Administrative	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	
Civil Engineer	
Community Planner	
Emergency Manager	
Floodplain Administrator	
GIS Coordinator	
Planning Commission	
Other	
Technical	Has capability been used to assess/mitigate risk in the past?
Grant Writing	
Hazard Data and Information	
GIS Analysis	
Mutual Aid Agreements	
Other	
FINANCIAL	
Funding Resource	Has the funding resource been used in the past and for what type of activities? Could it be used to fund future mitigation actions?
Capital Improvements Project Funding	
Community Development Block Grant	
Federal Funding Programs (non-FEMA)	
Fees for Water, Sewer, Gas, or Electric Services	
Impact Fees for New Development	
State Funding Programs	
Stormwater Utility Fees	
Other	
EDUCATION AND OUTREACH	
Program/Organization	How widespread are each of these in your community?
Community Newsletters	
Hazard Awareness Campaigns	
Local News	
Organizations that Represent/ Advocate for/ Interact with Underserved and Vulnerable Communities	
Social Media Platforms	
Other	

APPENDIX E: National Flood Insurance Program Assessment Tool

NFIP TOPIC	SOURCE OF INFORMATION
Who is responsible for floodplain management in your community? Do they serve any roles other than Community Floodplain Administrator (FPA)?	
Is the Community FPA or NFIP Coordinator a Certified Floodplain Manger?	
Is floodplain management an auxiliary function?	
Explain NFIP administration services (i.e., permit review, GIS, inspections, engineering, capability).	
What are the barriers to running an effective NFIP program in the community, if any?	
How many NFIP policies are in the community? What is the total premium and coverage?	
How many claims have been paid out in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	
How many structures (residential and non- residential) are exposed to flood risk within the community?	
Are there any repetitive or severe repetitive loss structures in the community?	
Describe any areas of flood risk with limited NFIP policy coverage.	
How does the community teach property owners or other stakeholders about the importance of flood insurance?	
What digital sources (i.e.., FEMA Map Service Center, National Flood Hazard Layer) or non-regulatory tools does the community use?	
Is the community currently suspended from the NFIP?	
Are there any outstanding compliance issues (i.e., current violations)?	
How does the community identify substantially damaged/ improved structures? What is the process to make sure these structures are brought into compliance?	
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	
Is a CAV or CAC scheduled or needed?	
When did the community enter the NFIP?	
Are the FIRMs digital or paper?	
How does the community enforce local floodplain regulations and monitor compliance?	
Do floodplain development regulations meet or exceed FEMA or state minimum requirements? If so, in what ways?	
How are Letters of Map Change (LOMCs) tracked and compiled?	
Explain the permitting process.	
Does the community participate in CRS? If so, what is the community's CRS Class Ranking?	
What categories and activities provide CRS points, and how can the class be improved?	
Does the plan include CRS planning requirements?	

NEXT STEPS: If you were unsure or answered "no" to any of these questions, consider short- and long-term action items to address them. If you need help identifying trainings or other resources, contact your State Hazard Mitigation Officer or State NFIP Coordinator.

RESOURCE LIST: FEMA Substantial Damage Estimator Tool; National Flood Hazard Layer; FEMA Flood Map Service Center

APPENDIX F: Progress Tracking Tool

BROWN COUNTY	
ACTION ITEM	NOTES
Inundation Zone Mapping	
NFIP Tracking	
Dam Improvement	
Communication Interoperability	
Public Education	
Stakeholder Participation	
Storm Siren Systems	
Community/Residential Safe Rooms	
Wildland Urban Interface	
Critical Facility Generators	
Retrofit Critical Facilities	
Drains and Culverts	

BANGS	
ACTION ITEM	NOTES
NFIP Tracking	
Community Shelter	
Public Education	
Stakeholder Participation	
Storm Siren Systems	
Community/Residential Safe Rooms	
Wildland Urban Interface	
Critical Facility Generators	
Retrofit Critical Facilities	
Drains and Culverts	

BLANKET	
ACTION ITEM	NOTES
NFIP Tracking	
Water Meters	
Water Lines	
Public Education	
Stakeholder Participation	
Storm Siren Systems	
Community/Residential Safe Rooms	
Wildland Urban Interface	
Critical Facility Generators	
Retrofit Critical Facilities	
Drains and Culverts	

BROOKESMITH ISD	
ACTION ITEM	NOTES
Radio Access to Dispatch	
Weapon Security	
Panic Buttons	
Perimeter Fencing and Gates	
Safety Vests	
Public Education	
Stakeholder Participation	
Storm Siren Systems	
Community/Residential Safe Rooms	
Wildland Urban Interface	
Critical Facility Generators	
Retrofit Critical Facilities	
Drains and Culverts	

BROWNWOOD	
ACTION ITEM	NOTES
NFIP Tracking	
Training Assessment	
First Responder Health & Safety	
Mutual Aid Agreements	
Identification of Vulnerable Populations	
Stormwater Detention/ Retention	
Magnolia Ditch Project	
Capital Improvement Program Fund	
Public Education	
Stakeholder Participation	
Storm Siren Systems	
Community/Residential Safe Rooms	
Wildland Urban Interface	
Critical Facility Generators	
Retrofit Critical Facilities	
Drains and Culverts	

EARLY	
ACTION ITEM	NOTES
NFIP Tracking	
Stormwater Detention/Retention	
Fire Danger/ Burn Ban Signs	
Public Education	
Stakeholder Participation	
Storm Siren Systems	
Community/Residential Safe Rooms	
Wildland Urban Interface	
Critical Facility Generators	
Retrofit Critical Facilities	
Drains and Culverts	

APPENDIX G: Amendment Log

JURISDICTION	DATE	SECTION	PAGE	DESCRIPTION OF CHANGE(S)

APPENDIX H: Record of Adoption

[INSERT DOCUMENTATION WHEN COMPLETE]