2021

Hood County Hazard Mitigation Action Plan




North Central Texas Council of Governments

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Executive Summary

We cannot control when or where a tornado or other natural hazard will strike, but we can save lives and reduce property damage by understanding the risks and taking action to address those risks. In the process, we can increase resilience in our community, environment, and economy. Participating jurisdictions in the Hood County Hazard Mitigation Action Plan (HazMAP) are dedicated to the protection of local citizens and their property, and to the improvement of the quality of life for all residents.

Mitigation has been defined as "sustained action to reduce or eliminate long-term risk to human life and property from natural, human-caused, and technological hazards."[1] It is fundamentally a loss-prevention function characterized by planned, long-term alteration of the built environment to ensure resilience against natural and human-caused hazards. This loss-prevention function has been illustrated by the Multi-Hazard Mitigation Council study of the Federal Emergency Management Agency (FEMA) mitigation projects, which shows that for every dollar invested in mitigation, six dollars of disaster losses were avoided.[2]

Mitigation should form the foundation of every emergency management agency's plans and procedures. Emergency management agencies should adopt mitigation practices to reduce, minimize, or eliminate hazards in their community. The Hood County Hazard Mitigation Action Plan identifies the hazards faced by participating jurisdictions, vulnerabilities to these hazards, and mitigation strategies for the future. The plan fulfills the requirements of the Federal Disaster Mitigation Act as administered by the Texas Division of Emergency Management (TDEM) and the Federal Emergency Management Agency (FEMA).

This plan is not legally binding but, instead, is a tool for the jurisdiction to use to become more resilient to natural hazards. Mitigation actions will be implemented as capabilities and funding allow.

[1] State of Texas Mitigation Handbook, page 1-1.
[2] Natural Hazard Mitigation Saves: 2017 Interim Report, page 1.

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Acronyms

EMC- Emergency Management Coordinator

EOC- Emergency Operations Center

FEMA- Federal Emergency Management Agency

HazMAP- Hazard Mitigation Action Plan

HMPT- Hazard Mitigation Planning Team

LPT- Local Planning Team

N/A- Not Applicable

NCEI- National Centers for Environmental Information

NCTCOG- North Central Texas Council of Governments

NFIP- National Flood Insurance Program

NFPA- National Fire Protection Association

NWS- National Weather Service

OWS- Outdoor Warning Siren

RLP- Repetitive Loss Properties

SRLP- Severe Repetitive Loss Properties

TDEM- Texas Division of Emergency Management

TFS- Texas A&M Forest Service

TPW- Texas Parks & Wildlife Department

TxDOT- Texas Department of Transportation

UTA- University of Texas at Arlington

WUI- Wildland-Urban Interface

Contents

Chapter 1: Introduction

1.1 Overview

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

This HazMAP is an update of the 2015 FEMA-approved HazMAP. The title was changed from the Local Mitigation Action Plan to Hazard Mitigation Action Plan to clearly specify the intent of the document. With each update, new challenges are identified, new strategies proposed, and when incorporated, the updated plan grows in complexity, but not necessarily in utility.

This HazMAP is the result of two years of study, data collection, analysis, and community feedback. Representatives and citizens from participating jurisdictions attended public meetings to discuss the hazards their communities face and the vulnerabilities those hazards present.

All participants involved in this plan understand the benefits of developing and implementing mitigation plans and strategies. Elected officials, public safety organizations, planners, and many others have worked together to develop and implement this HazMAP, displaying that they have the vision to implement mitigation practices and therefore reduce the loss of life and property in their communities.

Information was collected up to 2018.

1.2 Authority

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

The Stafford Act authorizes the following grant programs:

- Hazard Mitigation Grant Program (HMGP), which helps communities implement hazard mitigation measures following a Presidential major disaster declaration. This program also funds development and update of hazard mitigation plans.
- Pre-Disaster Mitigation Grant Program (PDM), which awards planning and project grants to assist states, territories, federally-recognized tribes, and local communities in implementing sustained pre-disaster natural hazard mitigation programs. Such efforts may include development or update of hazard mitigation plans.
- Public Assistance Grant Program (PA), which provides assistance to state, tribal, and local governments, and certain types of private nonprofit organizations so that communities can quickly respond to and recover from major disasters or emergencies declared by the President.

- Fire Management Assistance Grant Program (FMAG), which provides assistance to state, tribal, and local governments for the mitigation, management, and control of fires on publicly or privately-owned forests or grasslands that threaten such destruction as would constitute a major disaster.

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

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

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

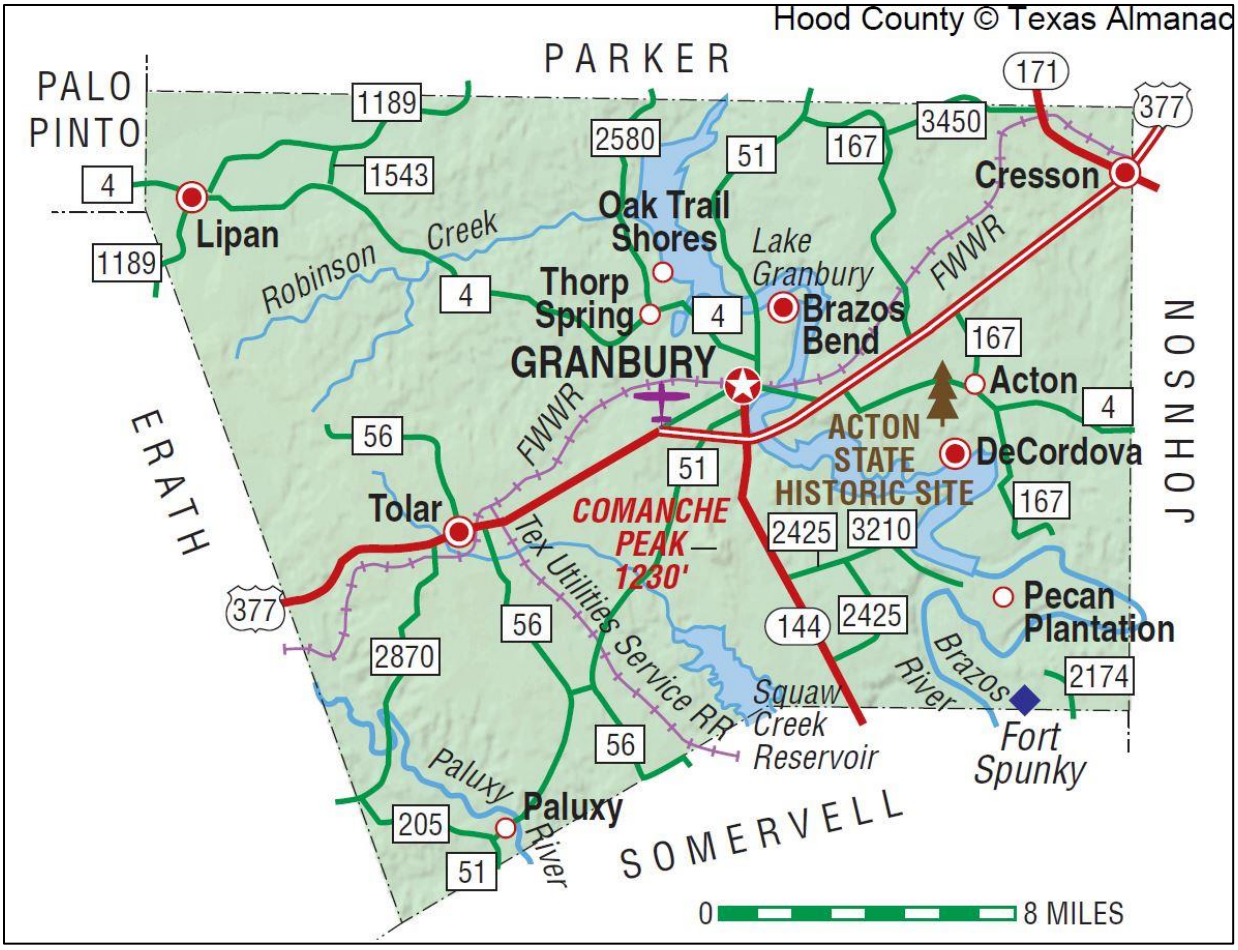
1.3 Scope

The scope of the Hood County HazMAP encompasses all participating entities in Hood County. This plan identifies natural and, for some jurisdictions, technological hazards that could threaten life and property in the communities. Assessing technological hazards is not a requirement for this hazard mitigation action plan but select jurisdictions have included these hazards in this plan. The scope of this plan includes both short and long-term mitigation strategies, implementation, strategies, and possible sources of project funding to mitigate identified hazards.

The planning area for this plan is for Hood County, Texas (marked in red on the Texas map) and includes the following jurisdictions:

- City of Cresson
- City of Granbury
- City of Lipan*
- City of Tolar*
- Hood County Unincorporated

**Jurisdictions that did not participate in the 2015 Hood County HazMAP.*



1.4 Purpose

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

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

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

Mitigation planning is imperative to lessen the impact of disasters in Hood County. This plan is an excellent method by which to organize Hood County's mitigation strategies. The implementation of the plan and its components is vital to preparing a community that is resilient to the effects of a disaster. The

implementation of this HazMAP can reduce loss of life and property and allow the participating communities to operate with minimal disruption of vital services to citizens. This HazMAP provides a risk assessment of the hazards Hood County is exposed to and puts forth several mitigation goals and objectives that are based on that risk assessment.

1.5 Mitigation Goals

The goals of the participants' mitigation strategy are to protect life and reduce bodily harm from natural hazards, and to lessen the impacts of natural hazards on property and the community through hazard mitigation. These goals are the basis of this plan and summarize what the Hood County Hazard Mitigation Planning Team will accomplish by implementing this plan.

1.6 Plan Organization

This Hood County HazMAP is organized into five chapters which satisfy the mitigation requirements in 44 CFR Part 201.6, with four appendices providing the required supporting documentation.

Chapter 1: Introduction

Describes the purpose of the Hood County Hazard Mitigation Action Plan and introduces the mitigation planning process.

Chapter 2: Planning Process

Describes the planning process and organization for each participating jurisdiction, satisfying requirements 201.6(c)(1), 201.6(b)(2), 201.6(b)(1), 201.6(b)(3), 201.6(c)(4)(i), 201.6(c)(4)(ii), and 201.6(c)(4)(iii).

Chapter 3: Hazard Identification and Risk Assessment

Describes the hazards identified, location of hazards, previous events, and jurisdictional profiles, satisfying requirements 201.6(c)(2)(i) and 201.6(c)(2)(ii).

Chapter 4: Mitigation Strategy

Reflects on the mitigation actions previously identified and examines the ability of Hood County and participating jurisdictions to implement and manage a comprehensive mitigation strategy, satisfying requirements 201.6(c)(1), 201.6(c)(3)(i), 201.6(c)(3)(ii), 201.6(c)(3)(iii), 201.6(c)(3)(iv), 201.6(c)(4)(ii), and 201.6(b)(3).

Chapter 5: Conclusion

Appendix A: Maps & Tables

Appendix B: Capabilities Assessment

Appendix C: NCTCOG Programs

Appendix D: Public Documents

Appendix E: Local Planning Teams

1.7 Hood County Hazard Mitigation Strategy Maintenance Process

The Hood County Hazard Mitigation Planning Team, consisting of a representative from each participating jurisdiction, will continue to collaborate as a planning group in coordination with Hood County Office of Emergency Management. Primary contact will be through emails and conference calls, with strategy meetings to occur at least annually. The plan in its entirety, including but not limited to will be monitored and evaluated. The points of contact for the county and jurisdictions will jointly lead the plan maintenance and update process by:

- Assisting jurisdictional Local Planning Teams in updating their individual contributions to the county Hazard Mitigation Action Plan.
- Assisting interested Local Planning Teams that would like to begin their mitigation planning process.
- Facilitating Hood County HazMAP meetings and disseminating information.
- Collaborating on data collections and record keeping.
- Requesting updates and status reports on planning mechanisms.
- Requesting updates and status reports on mitigation action projects.
- Assisting jurisdictions with mitigation grants.
- Assisting jurisdictions with implementing mitigation goals and action projects.
- Providing mitigation training opportunities.
- Maintaining documentation of local adoption resolutions for the Hood County Hazard Mitigation Action Plan.

1.8 Hood County Hazard Mitigation Action Plan Adoption

Once the Hood County Hazard Mitigation Action Plan has received FEMA "Approved Pending Local Adoption" each participating jurisdiction will take the Hood County HazMAP to their Commissioners Court or city councils for final public comment and local adoption. A copy of the resolution will be inserted into the Hood County HazMAP and held on file at the North Central Texas Council of Governments.

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Chapter 2: Planning Process

Requirement	
§201.6(b)	An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:
§201.6(b)(1)	An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
§201.6(b)(2)	An 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; and
§201.6(b)(3)	Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.
§201.6(c)(1)	[The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.
§201.6(c)(4)(i)	[The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle
§201.6(c)(4)(iii)	[The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

2.1 Collaborative Process

A comprehensive county approach was taken in developing the plan. An open public involvement process was established for the public, neighboring communities, regional agencies, businesses, academia, etc. to provide opportunities for everyone to become involved in the planning process and to make their views known. The meetings were advertised with notices in public places and city websites and social media pages.

Each participating jurisdiction gathered their information using a Local Planning Team (LTP), comprised of local staff that could contribute to development of this mitigation plan. The leaders of each of these LPT's comprised the Hood County Hazard Mitigation Planning Team (HMPT) and other relevant agencies. The HMPT met regularly with the North Central Texas Council of Governments in order to submit individual assessments and data into one multi-jurisdictional mitigation plan.

Stakeholders were invited to participate, via email, by participating jurisdictions.

The North Central Texas Council of Governments was responsible for plan facilitation and coordination with Hood County HMPT members and stakeholders throughout the process.

2.1.1 Points of Contacts

The following are members of the Hood County Hazard Mitigation Planning Team (HMPT). These HMPT members were also the point(s) of contact for their respective jurisdiction during this plan update.

Hood County HMPT Members

Jurisdiction	Job Title	Role in the HMPT
City of Cresson	City Administrator	Jurisdictional information and LPT Lead
City of Granbury	City Secretary	Jurisdictional information and LPT Lead
City of Lipan	City Secretary	Jurisdictional information and LPT Lead
City of Tolar	City Secretary	Jurisdictional information and LPT Lead
Hood County Unincorporated	Emergency Management Coordinator	Jurisdictional information and LPT Lead

Each HMPT member led a Local Planning Team (LPT) in their respective jurisdictions. The LPT members are listed in Appendix E.

2.1.2 Stakeholders

Stakeholders were invited to participate in the planning process, via email, and included local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development, and neighboring communities.

Stakeholders

Organization Represented	Position
Parker County	Emergency Management Coordinator
Palo Pinto County	Emergency Management Coordinator
Erath County	Emergency Management Coordinator
Somervell County	Emergency Management Coordinator
Johnson County	Emergency Management Coordinator
U.S. Army Corps of Engineers	Director – Civil Works
Dams in Participating Jurisdictions	Owners
Independent School Districts of Participating Jurisdictions	Superintendents
Texas Department of Transportation	Emergency Operations
Utility Providers	Emergency Operations
Local Emergency Planning Committee	Emergency Management Coordinator
Texas Division of Emergency Management	District Coordinator, Field Response
Texas Division of Emergency Management	Hazard Mitigation Planner
State Fire Marshal's Office	District 6, Inspector

Organization Represented	Position
National Weather Service – Fort Worth	Warning & Coordination Meteorologist
NCTCOG's Emergency Preparedness Planning Council	Chair
NCTCOG's Regional Emergency Preparedness Advisory Council	Chair
Local City Councils	Local elected officials
Brazos River Authority	Project Manager

2.1.3 Public Involvement

NCTCOG hosted a public meeting on behalf of jurisdictions on August 22, 2019 at the Hood County Commissioners Courtroom. The jurisdictions who used this opportunity to reach the public were in attendance and advertised the meeting within their jurisdiction.

The supporting documentation, advertisements, and details of this meeting and other meetings or outreach strategies are documented within Appendix D of this HazMAP. There were no public comments made during the meeting.

Public participation will remain an active component of this plan, even after adoption, to ensure citizens understand what the community is doing on their behalf, and to provide a chance for input on community vulnerabilities and mitigation activities that will inform the plan's content. Public involvement is also an opportunity to educate the public about hazards and risks in the community, types of activities to mitigate those risks, and how these activities impact them. Involvement will be sought in a multitude of ways, including but not limited to periodic presentations on the plan's progress to elected officials, schools, or other community groups; annual questionnaires or surveys; public meetings; and postings on social media and interactive websites.

2.2 Existing Data and Plans

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

Data Source	Data Incorporation	Purpose
County appraisal data, census data, city land use data	Population and demographics	Population counts, parcel data, and land use data
National Centers for Environmental Information (NCEI)	Hazard occurrences	Previous event occurrences and mapping for hazards

Data Source	Data Incorporation	Purpose
Texas Forest Service/Texas Wildfire Risk Assessment Summary Report	Wildfire threat and urban interface	Mapping and wildfire vulnerability
U.S. Army Corps of Engineers National Dam Inventory	Dam information	Dam list
Federal Emergency Management Agency (FEMA) Digital Flood Insurance Rate Map (DFIRM) Flood Zones, National Flood Insurance Program (NFIP) studies	Flood zone maps and NFIP information	GIS mapping of flood zones and NFIP data
October 2017 NFIP Flood Insurance Manual Change Package	NFIP Information	Repetitive Loss Properties and Community Rating System (CRS) ratings
State of Texas Hazard Mitigation Plan, 2013 and 2018 editions	Hazards and mitigation strategy	Support the goals of the state
2015 Hood County HazMAP	All Chapters	This is an update of that plan
Hazard Mitigation: Integrating Best Practices into Planning	Planning process	Use proven techniques in developing the HazMAP
Environmental Protection Agency (EPA) Superfund National Priority List	Protected sites	Risk assessment- identify critical areas
National Register of Historic Places	Historic districts	Risk assessment
Texas Parks & Wildlife List of Rare Species	Endangered or protected species	Risk assessment
Texas Water Development Board	Lake information	Vulnerabilities
U.S. Department of Agriculture	Soil type	Expansive Soils description

2.3 Timeframe

The planning process for the update of the Hood County Hazard Mitigation Action Plan was approximately two years. The table below is the timeline followed.

Activity	Time Period
Kickoff meeting	November, 2018
Created planning teams	November-December, 2018
Capabilities assessment	January-March 2019
Hazard identification & risk assessment	January-March 2019
Public outreach	July-August 2019
Mitigation strategy (goals & action items)	July-August 2019
Review HazMAP draft	January, 2020
Update plan as needed	January, 2020
Final draft review	January, 2020

Activity	Time Period
Send HazMAP to TDEM/make revisions as needed	March, 2020
Send to FEMA/ make revisions as needed	To be determined
Adoption & signatures	Once “Approved Pending Adoption” designated received.

Activities were either led or monitored by the North Central Texas Council of Governments (NCTCOG) and public outreach strategies were conducted by the participating jurisdictions. The details of these activities are provided in the individual annexes of the jurisdictions.

2.4 Planning Meetings

During the planning process, the Hazard Mitigation Planning Team met to discuss relevant information from the jurisdiction and to review objectives and progress of the plan. The goals of these meetings were to gather information and to provide guidance for the jurisdictions throughout the planning stages.

The following meetings were hosted by the North Central Texas Council of Governments for the HazMAP participants and do not represent all the meetings that were conducted throughout the process by the Local Planning Teams.

Date	Meeting
November 1, 2018	HazMAP Kickoff Meeting
January 30, 2019	Hazard Identification, Risk Assessment, and Capabilities Assessment Meeting
February 7, 2019	Hazard Identification, Risk Assessment, and Capabilities Assessment Meeting
August 22, 2019	Public Meeting and Mitigation Workshop

2.5 Plan Implementation

The Hood County Hazard Mitigation Action Planning process was overseen by the North Central Texas Council of Governments (NCTCOG). The plan was submitted to the Texas Division of Emergency Management (TDEM) and the Federal Emergency Management Agency (FEMA) for approval. It is expected that all participating jurisdictions will formally adopt the plan by resolution once the “Approved Pending Adoption” designation is received by FEMA, in accordance with the Disaster Mitigation Act of 2000.

Each jurisdiction participating in this plan is responsible for implementing specific mitigation actions as prescribed in the mitigation strategies. In each mitigation strategy, every proposed action is assigned to a specific local department or agency in order to assign responsibility and accountability and increase the likelihood of subsequent implementation. This approach enables individual jurisdictions to update their unique mitigation strategy as needed without altering the broader focus of the county-wide plan. The separate adoption of locally-specific actions also ensures that each jurisdiction is not held responsible for monitoring and implementing the actions of other jurisdictions involved in the planning process.

The Hood County Emergency Management Coordinator or their designee is the lead position for plan implementation and will work with the Hood County Hazard Mitigation Planning Team (HMPT) to ensure mitigation actions are implemented into jurisdictional planning procedures. Each participating jurisdiction will implement the plan and their individual mitigation actions in the timeframe appropriate for their planning processes. As necessary, the HMPT will seek outside funding sources to implement mitigation projects in both the pre-disaster and post-disaster environments. When applicable, potential funding sources have been identified for proposed actions listed in the mitigation strategies.

2.6 Multijurisdictional Strategy and Considerations

The Hood County Office of Emergency Management will lead activities for mitigation planning county-wide. Although The Hood County Office of Emergency Management will be responsible for maintaining this plan, including the documentation of in-progress and completed action items, each participating jurisdiction is responsible for reporting hazards, their costs, and a status report on mitigation actions to the North Central Texas Council of Governments (NCTCOG) for recording in the plan.

Each jurisdiction is responsible for completing mitigation activities by providing the capabilities and authorities needed to carry out activities. Participating jurisdictions completed an analysis of their current legal, staffing, and fiscal capabilities as they relate to hazard mitigation planning. Jurisdictional capabilities and authorities identified to ensure successful mitigation planning are located within the jurisdictional annexes.

2.7 Plan Evaluation

All members of the Hood County Hazard Mitigation Planning Team (HMPT) will be responsible for ensuring that the Hood County Hazard Mitigation Action Plan (HazMAP) is evaluated as required. Specifically, the Hood County Emergency Management Coordinator, or their designee, will convene the HMPT and ensure an evaluation is conducted in a thorough manner. This evaluation will include analysis of current mitigation projects, evaluation of success, reevaluation of future mitigation needs, and prioritization based upon changes in needs and/or capabilities of Hood County.

The HMPT will reconvene annually to ensure that projects are on track and to reevaluate the mitigation goals, objectives, and action items. The mitigation plan shall be viewed as an evolving, dynamic document.

2.8 Plan Update

The Disaster Mitigation Act of 2000 requires that the Hood County Hazard Mitigation Action Plan be updated at least once every five years. During this process, all chapters of the plan will be updated with current information, and analyses and new and/or modified mitigation actions will be developed. The revised plan will be submitted for state and federal review and approval and presented for approval to the Hood County Commissioners Court and the respective councils of incorporated cities included in this HazMAP. Likewise, each participating jurisdiction will undergo the same process for reviewing, revising and updating their respective plans and submitting them for approval by state, federal, and the local jurisdiction's governing body. The plan will be updated every five years in accordance with federal requirements. Hood County's Emergency Management Coordinator or their designee will be responsible

for ensuring that this requirement is met. Hood County and the Hazard Mitigation Planning Team will review the HazMAP annually for needed updates.

The HMPT will be involved in this process to ensure all jurisdictions provide input into the planning process. The public will be invited to participate in this process through public hearings.

2.9 Plan Maintenance

It is the intention of all documented plan participants to formally adopt the Hood County Hazard Mitigation Action Plan after each maintenance revision. Once all participants adopt the changes, the revised HazMAP and proof of adoption will be submitted by the North Central Texas Council of Governments (NCTCOG) to the Texas Division of Emergency Management and the Federal Emergency Management Agency. The plan will be revised and maintained as required under the guidance of the HazMAP and formally adopted by Hood County and jurisdiction elected officials after each revision. The plan in its entirety, including but not limited to will be monitored and evaluated.

Following formal adoption by the Hood County's Commissioners Court and formal adoption of the plan by the governing council of each participating jurisdiction, the actions outlined in the HazMAP will be implemented by the county and participating jurisdictions as described throughout this document.

The Hood County Emergency Management Coordinator (EMC), or their designee, is responsible for ensuring the HazMAP and its components are monitored, evaluated, and reviewed semiannually by the responsible personnel. The EMC will use email to request the monitoring activities noted below be implemented and changes documented. The progress of action items will be tracked electronically as "in progress," "deferred," or "completed."

These and other changes affecting the plan will be documented within the Hood County HazMAP file and identified as updates. Updates will be shared between participants by email or in a meeting (if deemed appropriate) twice a year, and included in annual evaluations and reviews, and the five-year update of the plan.

Members of the Hazard Mitigation Planning Team (HMPT) are responsible for ensuring their mitigation strategy is monitored, evaluated, and reviewed on an annual basis. This will be accomplished by the Hood County EMC calling an annual meeting of the HMPT, whose members will assist in plan review, evaluation, updates, and monitoring. This meeting will be open to the public and public notices will encourage community participation.

During this annual meeting, the members will provide information and updates on the implementation status of each action item included in the plan. As part of the evaluation, the HMPT will assess whether goals address current and expected conditions, whether the nature and/or magnitude of the risks have changed, if current resources are appropriate for implementing the HazMAP, whether outcomes have occurred as expected, and if agencies and other partners participated as originally proposed. These activities will take place according to the following timetable:

Responsible Personnel	Activity	Update Schedule
Local Planning Team Point of Contact	Monitoring Plan: track implementation and action items, changes to risk assessment, changes to Local Planning Team (LPT), changes to capabilities, and plan integrations.	Twice a year
	Evaluate Plan: assess effectiveness by evaluating completed actions, implementation processes, responsible personnel, and lessons learned.	Annually
	Update Plan	Once every five years

At least once every five years, or more frequently if such a need is determined by the participants, the HazMAP will undergo a major update with NCTCOG. During this process, all chapters of the plan will be updated with current information and analyses and new and/or modified mitigation action plans will be developed. The revised plan will be submitted for review and approval to the Texas Division of Emergency Management and the Federal Emergency Management Agency and presented to the governing council for approval and adoption. The plan will be updated every five years in accordance with regulations.

2.10 Incorporation into Existing Planning Mechanisms

The primary means for integrating mitigation strategies into other local planning mechanisms will be through the revision, update, and implementation of each participating jurisdiction's individual plans that require specific planning and administrative tasks (for example, plan amendments, ordinance revisions, and capital improvement projects).

The members of the HMPT will remain charged with ensuring that the goals and strategies of new and updated local planning documents for their jurisdictions are consistent with the goals and actions of the Hood County HazMAP and will not contribute to increased hazard vulnerability in Hood County or its participating jurisdictions.

During the planning process for new and updated local planning documents, such as a comprehensive plan, capital improvement plan, or emergency management plan, Hood County and its participating jurisdictions will provide a copy of the Hood County HazMAP to the appropriate parties and recommend that all goals and strategies of new and updated local planning documents are consistent with and support the goals of the Hood County HazMAP and will not contribute to increased hazards in the affected jurisdiction(s).

Chapter 3: Hazard Identification and Risk Assessment

Requirement	
§201.6(c)(2)(i)	[The risk assessment shall include a] description of the type, location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.
§201.6(c)(2)(ii)	[The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community. All plans approved after October 1, 2008 must also address NFIP [National Flood Insurance Program] insured structures that have been repetitively damaged by floods. The plan should describe vulnerability in terms of:
§201.6(c)(2)(ii)(A)	The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas;
§201.6(c)(2)(ii)(B)	An estimate of the potential dollar losses to vulnerable structures identified in this section and a description of the methodology used to prepare the estimate.
§201.6(c)(2)(ii)(C)	Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.
§201.6(c)(2)(iii)	For multi-jurisdictional plans, the risk assessment section must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.

3.1 Hazard Overview

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

- Drought
- Earthquakes
- Expansive Soils
- Extreme Heat
- Flooding (including dam failure)
- Thunderstorms (including hail, wind, and lightning)
- Tornadoes

- Wildfires
- Winter Storms

3.2 Major Disaster Declarations since the 2015 HazMAP

The following table lists the recent major disaster declarations that have occurred in Texas since the approval of Hood County's 2015 HazMAP until 2018:

Disaster	Event	Incident Period	Declared
DR-4485	Texas Covid-19 Pandemic	January 20, 2020 and continuing	March 25, 2020
DR-4377	Severe Storms and Flooding	June 19,2018- July 13,2018	July 06, 2018
DR-4332	Hurricane Harvey	August 23, 2017- September 15, 2017	August 25, 2017
DR-4272	Severe Storms and Flooding	May 22, 2016- June 24, 2016	June 11, 2016
DR-4269	Severe Storms and Flooding	April 17, 2016- April 30, 2016	April 25, 2016
DR-4266	Severe Storms, Tornadoes, and Flooding	March 07, 2016- March 29, 2016	March 19, 2016
DR-4255	Severe Winter Storms, Tornadoes, Straight-line Winds, and Flooding	December 26, 2016- January 21, 2016	February 09, 2016
DR-4245	Severe Storms, Tornadoes, Straight-line Winds, and Flooding	October 22, 2015- October 31, 2015	November 25, 2015
DR-4223	Severe Storms, Tornadoes, Straight-line Winds, and Flooding	May 04, 2015- June 22, 2015	May 29, 2015
DR-4159	Severe Storms and Flooding	October 30, 2013- October 31, 2013	December 20, 2013
DR-4136	Explosion (West, TX Fertilizer)	April 17, 2013- April 20, 2013	August 02, 2013

Source: FEMA

None of the participating jurisdictions were physically impacted by these declared disasters.

3.3 Natural Hazard Profiles

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

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- Extreme Heat
- Flooding (including dam failure)
- Thunderstorms (including hail, wind, and lightning)
- Tornadoes
- Wildfires
- Winter Storms

Due to the low probability and history of occurrence of coastal erosion, land subsidence, and hurricane/tropical storm, they will not be profiled in this plan.

Since the adoption of the 2015 HazMAP, the definition of a thunderstorm now includes hail, high winds, and lightning. These individual hazards within a thunderstorm will not be listed nor categorized separately.

Around 2013, areas of North Central Texas began experiencing earthquakes. It is suspected that dormant fault lines have been disturbed. Earthquakes have been added to the list of natural hazards profiled in this update for jurisdictions that feel they could be potentially impacted by them.

For this HazMAP, dam failure is considered a technological hazard and will be addressed in the flooding portion of this HazMAP when applicable. Dam failure is an accidental or unintentional collapse, breach, or other failure of an impoundment structure that results in downstream flooding and is considered both a natural hazard and technological hazard.

The following natural hazard profiles are listed in alphabetical order.

3.3.1 Drought

Drought can be defined as a water shortage caused by the natural reduction in the amount of precipitation expected over an extended period of time, usually a season or more in length. It can be aggravated by other factors such as high temperatures, high winds, and low relative humidity. Drought can impact the economy, environment, and society by limiting food and drinking water, destroying habitat, and triggering health and safety problems due to poor water quality and increased wildfires.

The following chart describes the drought monitoring indices along with drought severity, return period, and a description of the possible impacts of the severity of drought.

Drought Severity	Return Period (years)	Description of Possible Impacts	Drought Monitoring Indices		
			Standardized Precipitation Index (SPI)	NDMC* Drought Category	Palmer Drought Index
Minor Drought	3 to 4	Going into drought; short-term dryness slowing growth of crops or pastures; fire risk above average. Coming out of drought; some lingering water deficits; pastures or crops not fully recovered.	-0.5 to -0.7	D0	-1.0 to -1.9
Moderate Drought	5 to 9	Some damage to crops or pastures; fire risk high; streams, reservoirs, or wells low, some water shortages developing or imminent, voluntary water use restrictions requested.	-0.8 to -1.2	D1	-2.0 to -2.9
Severe Drought	10 to 17	Crop or pasture losses likely; fire risk very high; water shortages common; water restrictions imposed.	-1.3 to -1.5	D2	-3.0 to -3.9
Extreme Drought	18 to 43	Major crop and pasture losses; extreme fire danger; widespread water shortages or restrictions.	-1.6 to -1.9	D3	-4.0 to -4.9
Exceptional Drought	44+	Exceptional and widespread crop and pasture losses; exceptional fire risk; shortages of water in reservoirs, streams, and wells creating water emergencies.	less than -2	D4	-5.0 or less

*NDMC - National Drought Mitigation Center

In Texas, local governments are empowered to take action on the behalf of those they serve. When drought conditions exist, a burn ban can be put in place by a county judge or county Commissioners Court prohibiting or restricting outdoor burning for public safety.[3] According to the county website, an ozone alert in place or a wind advisory can lead to a burn ban being put in place for a given day in Hood County. If the county is under ozone alert, wind advisory, or fire weather watch, no burning of any kind is allowed.[4]

3.3.2 Earthquake

An earthquake is a sudden motion or trembling of the earth, either caused by an abrupt release of accumulated strain on the tectonic plates that comprise the earth's crust or from human activities. Scientific studies have tied the quakes in North Central Texas to the disposal of wastewater from oil and gas production.

Magnitude and intensity measure different characteristics of earthquakes. Magnitude measures the energy released at the source of the earthquake and is determined from measurements on seismographs. Intensity measures the strength of shaking produced by the earthquake at a certain location and is determined from effects on people, human structures, and the natural environment.

[3] Fire Danger: Texas Burn Bans. Texas A&M Forest Service. 2018.
<http://texasforestservice.tamu.edu/TexasBurnBans/>
[4] No Burning: (OZONE) Air Quality Alert. Hood County Texas.
< https://www.parkercountytx.com/231/Burn-Ban-Status-and-Burn-Notification-Fo>

The Modified Mercalli Intensity Scale classifies earthquakes by the amount of damage inflicted. It quantifies a quake's effects on the land's surface, people, and structures involved. The following is an abbreviated description of the levels of Modified Mercalli intensity.

Intensity	Shaking	Description/Damage
I	Not felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

Source: USGS Earthquake Hazards Program.

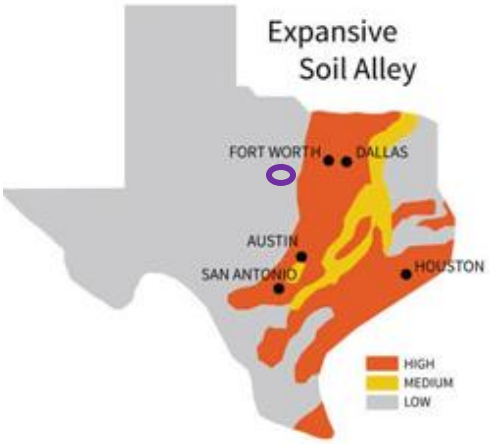
The following table gives intensities that are typically observed at locations near the epicenter of earthquakes of different magnitudes.

Magnitude	Typical Maximum Modified Mercalli Intensity
1.0 - 3.0	**I**
3.0 - 3.9	**II - III**
4.0 - 4.9	**IV - V**
5.0 - 5.9	**VI - VII**
6.0 - 6.9	**VII - IX**
7.0 and higher	**VIII** or higher

Source: USGS Earthquake Hazards Program.

3.3.3 Expansive Soils

Expansive soils are soils that contain large percentages of swelling clays that may experience volume changes of up to 40% in the absence or presence of water. Homes built on expanding smectite clays without due precautions will likely be structurally damaged as the clay takes up water. Cracks will appear in walls and floors. Damage can be minor, but it also can be severe enough for the home to be structurally unsafe. Expansive soil is considered one of the most common causes of pavement distresses in roadways. Depending upon the moisture level, expansive soils will experience changes in volume due to moisture fluctuations from seasonal variations.



Expansive soils is a condition that is native to Texas soil characteristics, and cannot be documented as a time-specific event, except when it leads to structural and infrastructure damage. The great increase in damages in Texas caused by problems with expansive soils can be traced to the rise in residential slab-on-grade construction which began to accelerate in the 1960s. Prior to that time, most residential construction in Texas was pier and beam, with wood siding or other non-masonry covering. Affected homes will be heavily influenced by their proximity to a large body of water, whereas older pier and beam foundations will behave in an entirely different manner.

Geographically, Hood County is located in the Western Cross Timbers land resource area. Some areas are sandy, some are clay, some are shallow and rocky, and others are pure caliche. Caliche is calcium carbonate that binds with gravel, sand, clay and silt to form a particularly difficult soil to penetrate. There are very few areas in the County that are considered fertile. The Weatherford series consists of deep, well drained, moderately permeable soils that formed in sandy and loamy residuum weathered from weakly cemented sandstone of the Cretaceous age. These very gently sloping to strongly sloping soils occur mainly on convex ridges on hills. Slope ranges from 1 to 12 percent. Mean annual precipitation is about 34 inches and the mean annual temperature is about 65 °F. [5]

A common procedure for evaluating and rating soil expansion potential is the Expansion Index (EI) test. The Expansion Index, EI, is used to measure a basic index property of soil and therefore, the EI is comparable to other indices such as the liquid limit, plastic limit, and plasticity index of soils.

Expansion Index (EI)	EI Potential Expansion
0-20	Very Low
21-50	Low
51-90	Medium
91-130	High
>130	Very High

Source: Expansion Index

[5] Weatherford Series. CRC: BJW: GLL. 2016.
< https://soilseries.sc.egov.usda.gov/OSD_Docs/W/WEATHERFORD.html>

3.3.4 Extreme Heat

Extreme heat is characterized by a combination of very high temperatures and exceptionally humid conditions. When persisting over a period of time, it is called a heat wave.

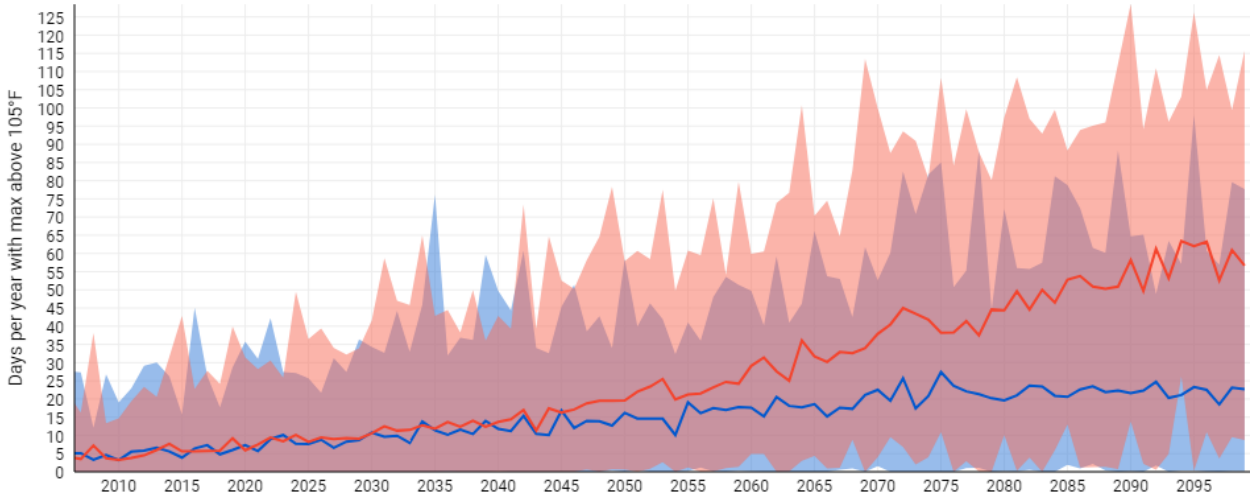
Extreme heat can be a factor that drastically impacts drought conditions, as high temperatures lead to an increased rate of evaporation. The total number of days per year with maximum temperature above various thresholds is an indicator of how often very hot conditions occur. Depending upon humidity,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

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

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

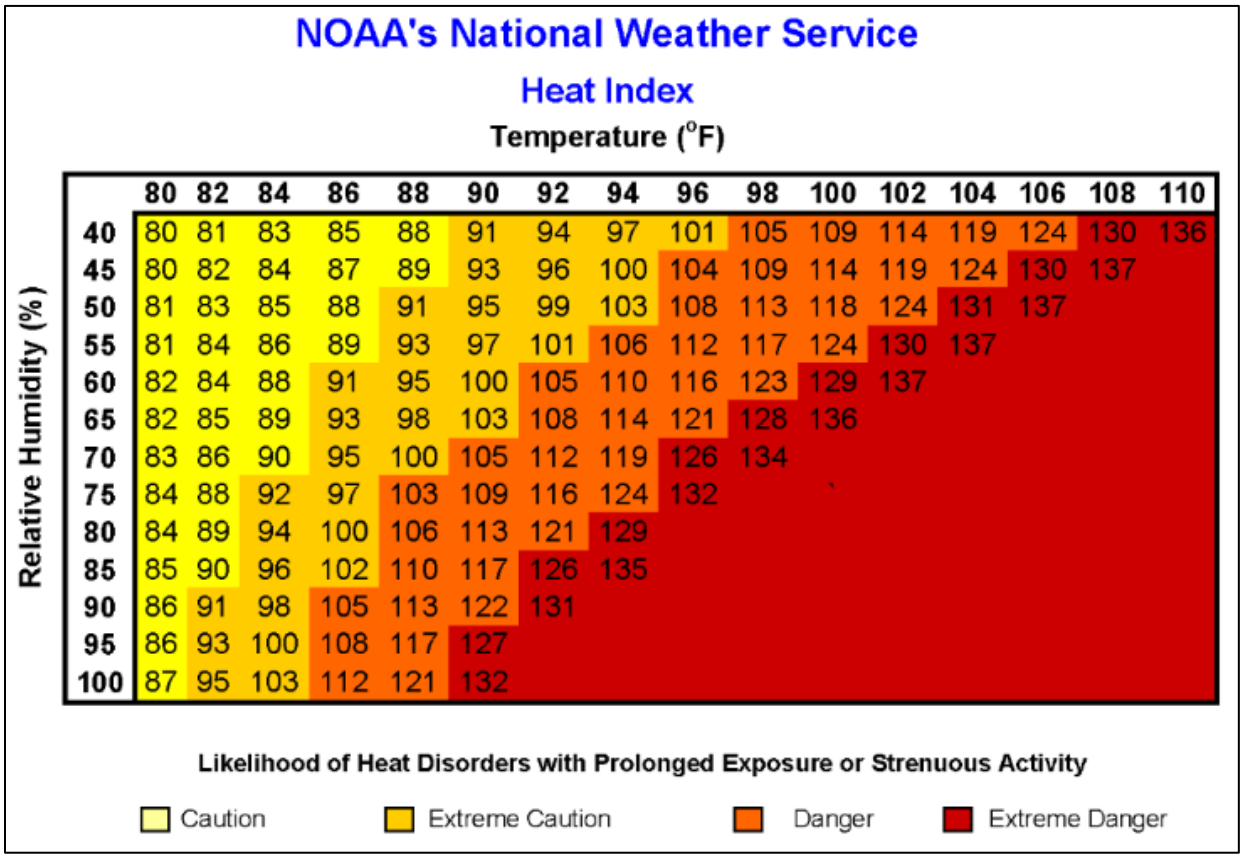
The trend shows how global emissions have a major role in climate variance and has an impact on extreme heat.

Predicted Number of Days Over 105°F in Hood County



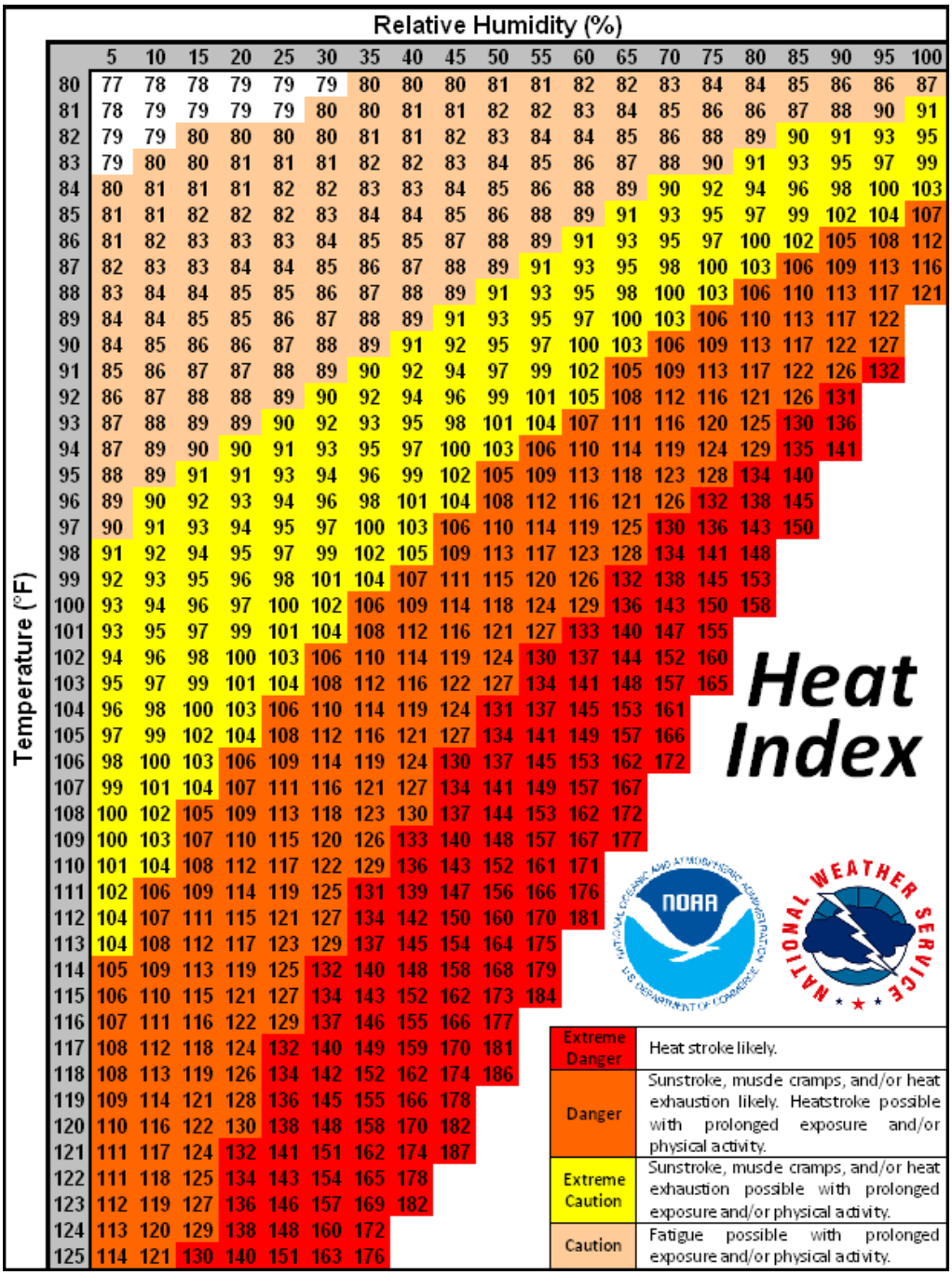
Source: U.S. Climate Resilience Toolkit

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



Relative Humidity (%)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

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



Temp (°F)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
80	77	78	78	79	79	79	80	80	80	81	81	82	82	83	84	84	85	86	86	87
81	78	79	79	79	79	80	80	81	81	82	82	83	84	85	86	86	87	88	90	91
82	79	79	80	80	80	80	81	81	82	83	84	84	85	86	88	89	90	91	93	95
83	79	80	80	81	81	81	82	82	83	84	85	86	87	88	90	91	93	95	97	99
84	80	81	81	81	82	82	83	83	84	85	86	88	89	90	92	94	96	98	100	103
85	81	81	82	82	82	83	84	84	85	86	88	89	91	93	95	97	99	102	104	107
86	81	82	83	83	83	84	85	85	87	88	89	91	93	95	97	100	102	105	108	112
87	82	83	83	84	84	85	86	87	88	89	91	93	95	98	100	103	106	109	113	116
88	83	84	84	85	85	86	87	88	89	91	93	95	98	100	103	106	110	113	117	121
89	84	84	85	85	86	87	88	89	91	93	95	97	100	103	106	110	113	117	122	
90	84	85	86	86	87	88	89	91	92	95	97	100	103	106	109	113	117	122	127	
91	85	86	87	87	88	89	90	92	94	97	99	102	105	109	113	117	122	126	132	
92	86	87	88	88	89	90	92	94	96	99	101	105	108	112	116	121	126	131		
93	87	88	89	89	90	92	93	95	98	101	104	107	111	116	120	125	130	136		
94	87	89	90	90	91	93	95	97	100	103	106	110	114	119	124	129	135	141		
95	88	89	91	91	93	94	96	99	102	105	109	113	118	123	128	134	140			
96	89	90	92	93	94	96	98	101	104	108	112	116	121	126	132	138	145			
97	90	91	93	94	95	97	100	103	106	110	114	119	125	130	136	143	150			
98	91	92	94	95	97	99	102	105	109	113	117	123	128	134	141	148				
99	92	93	95	96	98	101	104	107	111	115	120	126	132	138	145	153				
100	93	94	96	97	100	102	106	109	114	118	124	129	136	143	150	158				
101	93	95	97	99	101	104	108	112	116	121	127	133	140	147	155					
102	94	96	98	100	103	106	110	114	119	124	130	137	144	152	160					
103	95	97	99	101	104	108	112	116	122	127	134	141	148	157	165					
104	96	98	100	103	106	110	114	119	124	131	137	145	153	161						
105	97	99	102	104	108	112	116	121	127	134	141	149	157	166						
106	98	100	103	106	109	114	119	124	130	137	145	153	162	172						
107	99	101	104	107	111	116	121	127	134	141	149	157	167							
108	100	102	105	109	113	118	123	130	137	144	153	162	172							
109	100	103	107	110	115	120	126	133	140	148	157	167	177							
110	101	104	108	112	117	122	129	136	143	152	161	171								
111	102	106	109	114	119	125	131	139	147	156	166	176								
112	104	107	111	115	121	127	134	142	150	160	170	181								
113	104	108	112	117	123	129	137	145	154	164	175									
114	105	109	113	119	125	132	140	148	158	168	179									
115	106	110	115	121	127	134	143	152	162	173	184									
116	107	111	116	122	129	137	146	155	166	177										
117	108	112	118	124	132	140	149	159	170	181										
118	108	113	119	126	134	142	152	162	174	186										
119	109	114	121	128	136	145	155	166	178											
120	110	116	122	130	138	148	158	170	182											
121	111	117	124	132	141	151	162	174	187											
122	111	118	125	134	143	154	165	178												
123	112	119	127	136	146	157	169	182												
124	113	120	129	138	148	160	172													
125	114	121	130	140	151	163	176													

Extreme Danger	Heat stroke likely.
Danger	Sunstroke, musde cramps, and/or heat exhaustion likely. Heatstroke possible with prolonged exposure and/or physical activity.
Extreme Caution	Sunstroke, musde cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.
Caution	Fatigue possible with prolonged exposure and/or physical activity.

3.3.5 Flooding

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

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

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

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

Flash Flooding

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

Flooding from Dam Failure

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

Dam failure will be profiled in this plan within the flooding hazard.

3.3.6 Thunderstorms

A thunderstorm is a storm that consists of rain-bearing clouds and has the potential to produce hail, high winds, and lightning.

Hail

Hail occurs when, at the outgrowth of a severe thunderstorm, balls or irregularly shaped lumps of ice greater than 19.05 mm (0.75 inches) in diameter fall with rain. Early in the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to warm air rising rapidly into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until, having developed sufficient weight, they fall as precipitation.

The Tornado and Storm Research Organization (TORRO) scale for hail extends from H0 to H10 with its increments of intensity or damage potential related to hail size (distribution and maximum), texture, fall speed, speed of storm translation, and strength of the accompanying wind.

An indication of equivalent hail kinetic energy ranges (in joules per square meter) has now been added to the first six increments on the scale, and this may be derived from radar reflectivity or from hail pads. The International Hailstorm Intensity Scale recognizes that hail size alone is insufficient to accurately categorize the intensity and damage potential of a hailstorm, especially towards the lower end of the scale. For example, without additional information, an event in which hail of up to walnut size is reported (hail size code 3: hail diameter of 21-30 mm) would be graded as a hailstorm with a minimum intensity of H2-H3. Additional information, such as the ground wind speed or the nature of the damage the hail caused, would help to clarify the intensity of the event. For instance, a fall of walnut-sized hail with little or no wind may scar fruit and sever the stems of crops but would not break vertical glass and so would be ranked H2-H3. However, if accompanied by strong winds, the same hail may smash many windows in a house and dent the bodywork of a car, and so be graded an intensity as high as H5.

However, evidence indicates maximum hailstone size is the most important parameter relating to structural damage, especially towards the more severe end of the scale. It must be noted that hailstone shapes are also an important feature, especially as the "effective" diameter of non-spheroidal specimens should ideally be an average of the coordinates. Spiked or jagged hail can also increase some aspects of damage. Below is the TORRO Hailstorm Intensity Scale (H0 to H10) in relation to typical damage and hail size codes.

TORRO Hailstorm Intensity Scale				
Size Code	**Intensity Category**	**Typical Hail Diameter (mm)***	**Probable Kinetic Energy, J-m²**	**Typical Damage Impacts**
H0	Hard Hail	5	0-20	No damage
H1	Potentially Damaging	5-**15**	>20	Slight general damage to plants, crops
H2	Significant	10-**20**	>100	Significant damage to fruit, crops, vegetation
H3	Severe	20-**30**	>300	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	25-**40**	>500	Widespread glass damage, vehicle bodywork damage
H5	Destructive	30-**50**	>800	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	40-**60**		Bodywork of grounded aircraft dented, brick walls pitted
H7	Destructive	50-**75**		Severe roof damage, risk of serious injuries
H8	Destructive	60-**90**		Severe damage to aircraft bodywork
H9	Super Hailstorms	75-**100**		Extensive structural damage, risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	>100		Extensive structural damage, risk of severe or even fatal injuries to persons caught in the open

** Approximate range (typical maximum size in bold), since other factors (e.g. number and density of hailstones, hail fall speed, and surface wind speeds) affect severity.*

Wind

Straight-line winds are often responsible for the wind damage associated with a thunderstorm. Downbursts or micro-bursts are examples of damaging straight-line winds. A downburst is a small area of rapidly descending rain and rain-cooled air beneath a thunderstorm that produces a violent, localized downdraft covering 2.5 miles or less. Wind speeds in some of the stronger downbursts can reach 100 to 150 miles per hour, which is similar to that of a strong tornado. The winds produced from a downburst often occur in one direction and the worst damage is usually on the forward side of the downburst.

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

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

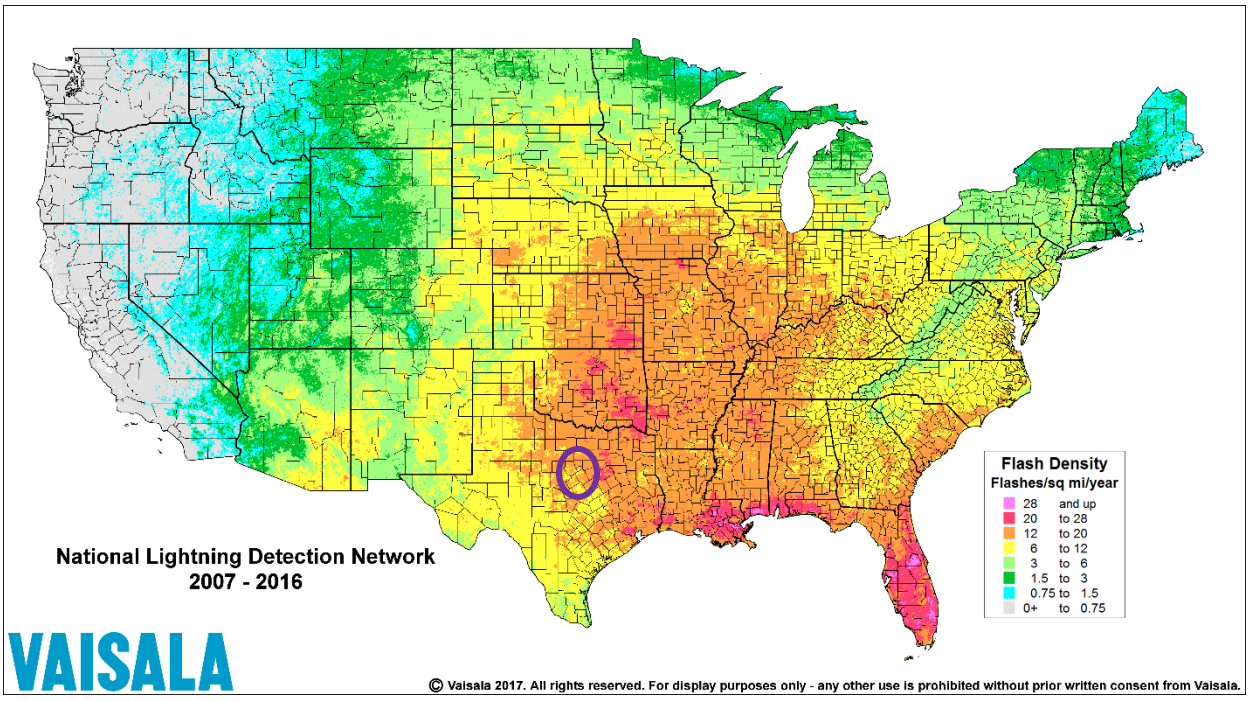
Lightning

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

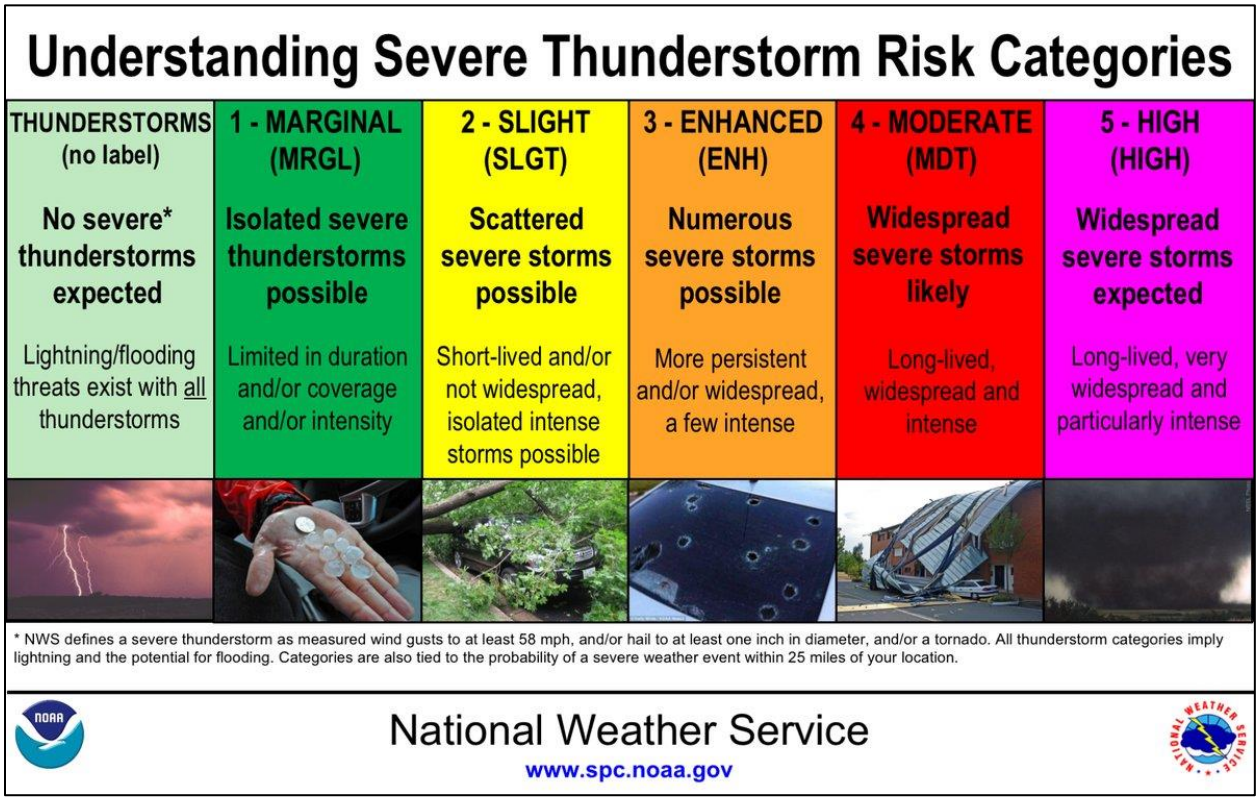
The lightning activity level (LAL) is a common parameter that is part of fire weather forecasts nationwide. LAL is a measure of the amount of lightning activity using values 1 to 6 where:

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

According to the following map from the National Lightning Detection Network, jurisdictions in Hood County experience a flash density of 12-20 flashes per square mile, per year.



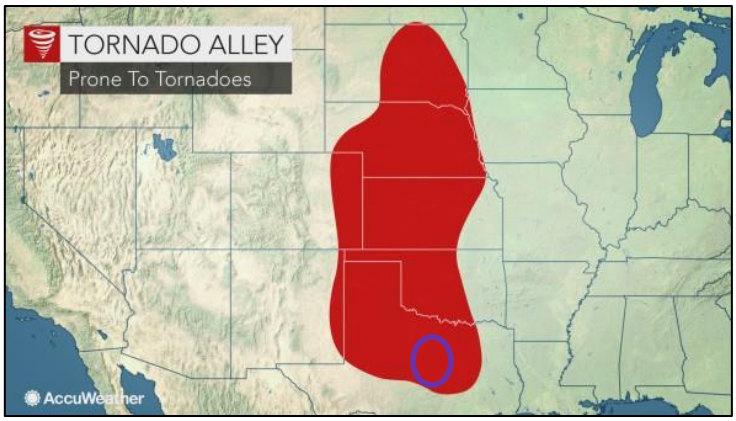
The National Weather Service uses the following Storm Prediction Center (SPC) activity levels to represent severe weather outlooks.



3.3.7 Tornadoes

A tornado is a violently rotating column of air that comes in contact with the ground. A tornado can either be suspended from, or occur underneath, a cumuliform cloud. It is often, but not always, visible as a condensation funnel.

Residents in Hood County are no strangers to tornadic events, as this area of Texas is a part of "Tornado Alley." Tornado Alley is an area of the U.S. where there is a high potential for tornado development. This area encompasses much of northern Texas northward through Oklahoma, Kansas, Nebraska and parts of New Mexico, South Dakota, Iowa, and eastern Colorado, as seen in this picture.



The Enhanced Fujita Scale, or EF Scale, is the scale for rating the strength of tornadoes during the observed time period via the damage they cause. Six categories from EF0 to EF5 represent increasing degrees of damage. The scale takes into account how most structures are designed and is thought to be an accurate representation of the surface wind speeds in the most violent tornadoes.

Enhanced Fujita Scale		
Enhanced Fujita Category	**Wind Speed in Miles Per Hour (MPH)**	**Potential Damage**
EF0	**65-85**	Light damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
EF1	**86-110**	Moderate damage. Roofs severely stripped; manufactured homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	**111-135**	Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; manufactured homes completely destroyed; large trees snapped or uprooted; light object become projectiles; cars lifted off ground.
EF3	**136-165**	Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF4	**166-200**	Devastating damage. Well-constructed houses and whole frame houses completely leveled; cars thrown, and small projectiles generated.
EF5	**>200**	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized projectiles fly through the air in excess of 300 feet.

3.3.8 Wildfire

Wildfire, or wildland fire, is any fire occurring on grassland, forest, or prairie, regardless of ignition source, damages, or benefits. Wildfires are fueled almost exclusively by natural vegetation. Interface or intermix fires are urban/wildland fires in which vegetation and the built environment provide fuel.

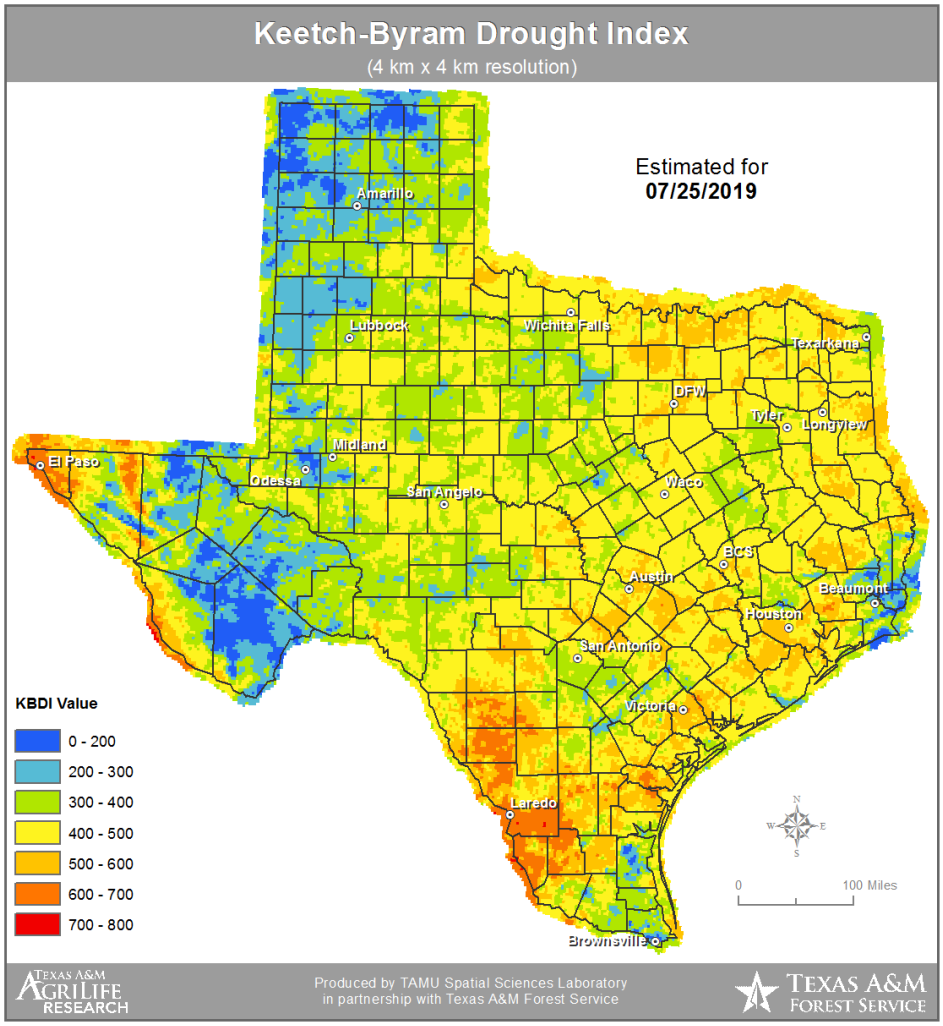
Texas A&M Forest Service (TFS) uses Keetch-Byram Drought Index (KBDI) for determination of drought conditions within the State of Texas. The KBDI is based on a daily water balance, where a drought factor is balanced with precipitation and soil moisture (assumed to have a maximum storage capacity of 8-inches)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

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

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

Index Value (inches)	Color Label	Implications
0 – 200	Blue	Soil moisture and large class fuel moistures are high and do not contribute much to fire intensity. Typical of early spring following winter precipitation.
200 – 400	Blue -> Green	Fuels are beginning to dry and contribute to wildfire intensity. Heavier fuels will still not readily ignite and burn. This is often seen in late spring or early summer.
400 – 600	Yellow -> Orange	Lower litter and duff layers contribute to fire intensity and will burn actively. Wildfire intensity begins to increase significantly. Larger fuels could burn or smoulder for several days. This is often seen in late summer and early fall.
600 – 800	Reds	Often associated with more severe drought with increased wildfire occurrence. Intense, deep-burning fires with extreme intensities can be expected. Live fuels can also be expected to burn actively at these levels.

Below is an example of the KBDI in Texas:



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

Prioritized Fuel Reduction and Treatment of Structural Ignitability

The following chart shows the vegetation, and thus the amount of fuel sources, in Hood County. Grassland is the majority of vegetation in the county.

	Class	Description	Acres	Percent
	Open Water	All areas of open water, generally with < 25% cover of vegetation or soil	9,632	3.4 %

	Class	Description	Acres	Percent
	Developed Open Space	Impervious surfaces account for < 20% of total cover (i.e. golf courses, parks, etc…)	16,649	5.9 %
	Developed Low Intensity	Impervious surfaces account for 20-49% of total cover	9,278	3.3 %
	Developed Medium Intensity	Impervious surfaces account for 50-79% of total cover	977	0.3 %
	Developed High Intensity	Impervious surfaces account for 80-100%of total cover	502	0.2 %
	Barren Land (Rock/Sand/Clay)	Vegetation generally accounts for <15% of total cover	101	0.0 %
	Cultivated Crops	Areas used for the production of annual crops, includes land being actively tilled	4,447	1.6 %
	Pasture/Hay	Areas of grasses and/or legumes planted for livestock grazing or hay production	9,359	3.3 %
	Grassland/Herbaceous	Areas dominated (> 80%) by grammanoid or herbaceous vegetation, can be grazed	157,785	56.0 %
	Marsh	Low wet areas dominated (>80%) by herbaceous vegetation	0	0.0 %
	Shrub/Scrub	Areas dominated by shrubs/trees < 5 meters tall, shrub canopy > than 20% of total vegetation	1,477	0.5 %
	Floodplain Forest	> 20% tree cover, the soil is periodically covered or saturated with water	4,290	1.5 %
	Deciduous Forest	> 20% tree cover, >75% of tree species shed leaves in response to seasonal change	17,735	6.3 %
	Live Oak Forest	> 20% tree cover, live oak species represent >75% of the total tree cover	5,046	1.8 %
	Live Oak/Deciduous Forest	> 20% tree cover, neither live oak or deciduous species represent >75% of the total tree cover	0	0.0 %
	Juniper or Juniper/Live Oak Forest	> 20% tree cover, juniper or juniper/live oak species represent > 75% of the total tree cover	12,823	4.5 %
	Juniper/Deciduous Forest	> 20% tree cover, neither juniper or deciduous species represent > 75% of the total tree cover	31,885	11.3 %
	Pinyon/Juniper Forest	> 20% tree cover, pinyon or juniper species represent > 75% of the total tree cover	0	0.0 %
	Eastern Redcedar Forest	> 20% tree cover, eastern redcedar represents > 75% of the total tree cover	0	0.0 %
	Eastern Redcedar/Deciduous Forest	> 20% tree cover, neither eastern redcedar or deciduous species represent > 75% of the total tree cover	0	0.0 %
	Pine Forest	> 20% tree cover, pine species represent > 75% of the total tree cover	0	0.0 %
	Pine Regeneration	Areas of pine forest in an early successional or transitional stage	0	0.0 %
	Pine/Deciduous Forest	> 20% tree cover, neither pine or deciduous species represent > 75% of the total tree cover	0	0.0 %
	Pine/Deciduous Regeneration	Areas of pine or pine/deciduous forest in an early successional or transitional stage	0	0.0 %
	Total		**281,986**	**100.0 %**

Source: Texas Wildfire Risk Assessment Portal Professional Viewer.

Common practices to minimize the spread of wildfire are fuel breaks and fire breaks. A **fuel break** is the thinning of vegetation, or fuels, over a specific area of land. They are most commonly used to surround a

community and slow the spread of a wildfire. By decreasing the amount of vegetation that the fire has to travel through, the risk of extreme fire behavior greatly depreciates.

Types of fuel breaks include:

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

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

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

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

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

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

- **Grazing**- Removing fuels by grazing relies on the consumption of plants by animals. Various types of livestock are used in this way across the state, including Hood County.

- **Prescribed Burning**- Prescribed or controlled, burning is the most commonly used tool for managing hazardous fuel buildups because of its relatively low cost per acre. Prescribed fire improves natural habitats and reduces heavy fuels. It is important to use a certified prescribe burn manager to improve fire safety and reduce smoke management issues.

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

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

- Follow a natural fire break or contour lines.
- Prune large trees to 10 feet from ground.
- Remove ladder fuels such as tall brush and small trees.
- Thin trees to create a crown spacing of 25 to 30 feet.
- Break up thick areas of brush.
- Maintain a minimum width of 60 feet on flat land and 100 feet on slopes.

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

Considering the various types of fuel and fire breaks, the participating jurisdictions who have identified wildfires as a threat have listed wildfire mitigation actions in Chapter 4, along with actions for all the other identified hazards.

3.3.9 Winter Storms

Winter storms originate as mid-latitude depressions or cyclonic weather systems, sometimes following the path of the jet stream. A winter storm or blizzard combines heavy snowfall, high winds, extreme cold, and ice storms. Many winter depressions give rise to exceptionally heavy rain and widespread flooding and conditions worsen if the precipitation falls in the form of snow. The winter storm season varies widely, depending on latitude, altitude, and proximity to moderating influences. The time period of most winter weather is expected to be during the winter season, between November and March. Winter storms affect the entire planning area equally.

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

An economic impact may occur due to increased consumption of heating fuel, which can lead to energy shortages and higher prices. Schools often close when severe winter weather is forecasted, and it becomes a logistical burden for parents who then have to miss work or find alternative childcare. House fires and resulting deaths tend to occur more frequently from increased and improper use of alternate heating sources. Fires during winter storms also present a greater danger because water supplies may freeze and impede firefighting efforts.

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

Weather Conditions and SPIA Index Levels at a Glance:

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

3.4 Vulnerabilities and Changes in Development since 2015 HazMAP

Vulnerabilities can be social, environmental, economic, or political in nature. These vulnerabilities in turn have various impacts.

We know that, by definition, disasters can cause death and injury. We also know that housing and schools may be destroyed. These particular losses may be considered to be social impacts, as they affect the ability of individuals and families to function.

With regard to negative environmental impacts, if a community contains important ecological sites (e.g., the site of a unique flora or fauna habitat), then these areas may be extremely vulnerable to almost any sort of disaster.

There is monetary loss, or negative economic impact, whenever buildings, non-structural property, or infrastructure is damaged or destroyed. These losses can also result in loss of jobs, loss of economic stability, and loss of services (e.g., power). The more vulnerable the community is to these types of losses, the greater the economic vulnerability to a disaster.

The ability of the community to influence policy makers to reduce vulnerabilities is critical. A disaster entails political impacts. After a disaster has struck, a community often turns to its politicians when looking for guidance. Vulnerabilities may be considered in terms of the individual, the location, the capacity to respond, and the time of day, week, or year.

According to FEMA, the definition of vulnerability is "the susceptibility of people, property, industry, resources, ecosystems, or historic buildings and artifacts to the negative impact of a disaster." The Hood County Hazard Mitigation Planning Team (HMPT) conducted a risk assessment to determine vulnerabilities in their jurisdictions. The following information is an overview of vulnerabilities within Hood County, including data about critical facilities/infrastructure, historic buildings, lakes, and natural environment.

Overall, the vulnerability level and priorities of the participants has remained the same since the last mitigation plan.

3.4.1 Critical Facilities and Infrastructure

Critical facilities and infrastructure provide services and functions essential to a community, especially during and after a disaster. For a critical facility to function, building systems and equipment must remain operational. Furthermore, it must be supplied with essential utilities (typically power, water, waste disposal, and communications, but occasionally natural gas and steam). An inventory of critical facilities in each participating jurisdiction is located in the Appendix A, though a list of examples is provided below.

Critical Facility Examples

- Ambulance Services (Private)
- Banks
- Detention Centers- federal
- Detention Centers- county
- Detention Centers- local
- Fire Stations
- Fueling Stations
- Government Offices-federal
- Government Offices-county
- Government Offices-local
- Grocery Stores
- Historical Sites
- Hospitals
- Landfills
- Major Employers
- Medical Clinics
- Pharmacies
- Physicians
- Police Stations
- Radio Stations
- Research Labs/Facilities
- Sheriff's Office
- Veterinarian Offices
- Water Towers

Vulnerable Facility Examples

- Amusement Parks
- Apartment Complexes
- Properties Within the 100-year Floodplain
- Recreation Centers

- Childcare Facilities
- Churches
- Hotels/Motels
- Mobile Home/RV Parks
- Nursing Homes
- Retirement Communities
- Schools (Elementary/Middle School/High School)
- Sporting Arenas
- Colleges
- Montessori's/Nursery Schools/Kindergartens

This hazard mitigation action plan (HazMAP) provides enough information regarding critical facilities to enable the jurisdiction to identify and prioritize appropriate mitigation actions; however, some information may be deemed highly sensitive and should not be made available to the public. Information jurisdictions consider sensitive should be treated as an addendum to this mitigation plan so that it is still a part of the plan, but access can be controlled.

According to the Department of Homeland Security, there are 16 critical infrastructure sectors whose assets, systems, and networks, whether physical or virtual, are considered so vital to the United States that their incapacitation or destruction would have a debilitating effect on security, national economic security, national public health or safety, or any combination thereof. The following list identifies the 16 critical infrastructure sectors.

Critical Infrastructure Sectors

- Chemical Sector
- Commercial Facilities Sector
- Communication Sector
- Critical Manufacturing Sector
- Dams Sector
- Defense Industrial Base Sector
- Emergency Services Sector
- Energy Sector
- Financial Services Sector
- Food and Agriculture Sector
- Government Facilities Sector
- Healthcare and Public Health Sector
- Information Technology Sector
- Nuclear Reactors, Materials, and Waste Sector
- Transportation Sector
- Water and Wastewater Systems Sector

The age of this infrastructure ties into its level of vulnerability. The older the infrastructure, the more likely it is to fail due to the impacting hazards. Collapsed bridges, unsafe power grids, interrupted water supply-weak infrastructure can turn natural hazards into disasters. When critical infrastructure fails, it becomes nearly impossible to aid those who lack the means of evacuating on their own. This results in rescue operations that take longer to plan and execute and pose increased risks to first responders and residents due to the lack of information on the number of affected residents or the location of those who need additional assistance. Below is a list of examples for critical infrastructure.

Critical Infrastructure Examples

- Airports
- Bridges and Overpasses
- Cell Towers
- Dams/ Levees
- Wastewater Pump & Lift Stations
- Major Roadways
- Power Plant
- Sewer Lines
- Solar Farms
- Superfund Sites
- Utility Lines
- Wastewater Treatment Facilities
- Water Lines
- Water Treatment Facilities

- Railways
- Wind Farms

The following sections go into detail about some of these critical infrastructures in Hood County.

Bridges

Bridges are *immensely* important to everyday travel. Bridges allow safe passage where previously it was not possible or much more difficult. Bridges allow people go to school, seek medical help, and go to work without having to negotiate a busy road, a dangerous railway line, or a fast-flowing river. Bridges are also extremely vulnerable to the impacts of natural hazards, specially earthquakes, flooding, and winter storms.

Below is a detailed list of the historic and notable bridges within the county. Of these 4 bridges, only 1 is open to vehicular traffic. These bridges are extremely vulnerable to severe weather.

Name	Location	Status	Design	Year Built	Year Lost	Span Length (ft.)	Total Length (ft.)
Fall Creek Bridge	Old Bridge Road over Fall Creek	Closed to all traffic	Pony truss	1946	--	91.9	91.9
Falls Creek Bridge	CR 506 over Falls Creek	Replaced by new bridge	Pony truss	1932	1993	75.1	134.8
Long Creek Bridge	Little Road over Long Creek	No longer exists	Pony truss	1944	2002	59.1	59.1
Rock Church Suspension Bridge	Former FM 2870 over Paluxy River	Closed to all traffic	Suspension	1917	--	100.0	100.0
Abbreviations:							
CR: County Road							
FM: Farm-to-Market							
Trib: Tributary							

Source: BridgeHooder.com

The Texas Department of Transportation (TXDoT) manages 60 on-system bridges and 23 off-system bridges within the county.

On-system bridges are located on the designated state highway system, are maintained by TxDOT, and are typically funded with a combination of federal and state or state-only funds.

Off-system bridges are not part of the designated state highway system and are under the direct jurisdiction of the local government such as a county, city, other political subdivision of the state, or special district with authority to finance a highway improvement project.

Roads

Hood County Road Operations maintains more than 461 linear miles of roadway and their rights of way, numerous bridges, and low-water crossings. However, there are many roads in Hood County that are not county-maintained roads including:

- Private roads constructed in private subdivisions that are maintained by the private residents / homeowners' association
- Roads within an established subdivision that have not been accepted for maintenance and are therefore still the responsibility of the developer
- Roads within the incorporated limits of cities, towns, or other entities and maintained by those entities
- U.S. highways, state highways, and farm-to-market roads maintained by the Texas Department of Transportation

Below is a list of low water crossings in Hood County as of 2012. A low water crossing provides a bridge or overpass for vehicles to cross bodies of water when water flow is low. Under high-flow conditions, water runs over the roadway and impedes vehicular traffic. Texas leads the nation in flash flood deaths, and most are due to people crossing these low areas in times of flooding.

Road	Flooding Source	Low Water Crossing Type	Owner
Asbury Road	Squaw Creek	N/A	
Colony Road	Strouds Creek South Fork, Trib	N/A	
Godley Road	Fall Creek	Unvented Ford	
Falls Road	Kickapoo Creek	Unvented Ford	
CR 310 (Contrary Creek Road)	Contrary Creek, Trib	Vented Ford	Hood County

Low Water Crossing Types Defined:

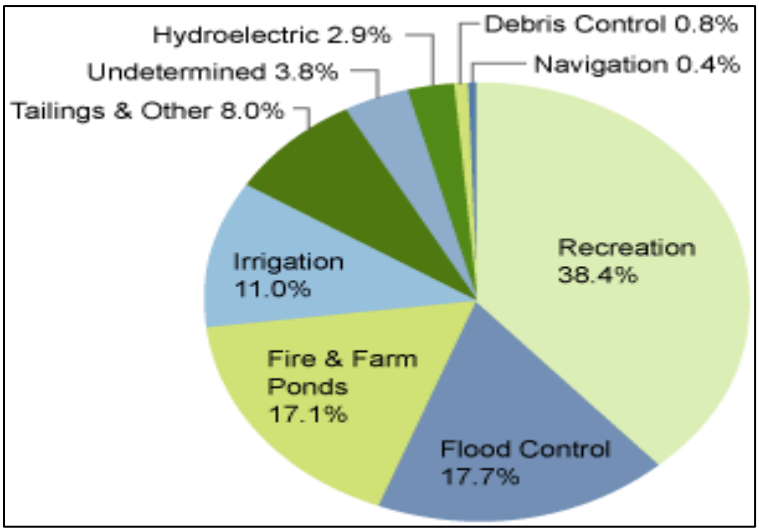
Vented fords have a driving surface elevated some distance above the streambed with culverts (vents) that enable low flows to pass beneath the roadbed. The vents can be one or more pipes, box culverts, or open-bottom arches. In streams carrying large amounts of debris, the driving surface over the vent may be removable, permitting debris to be cleared after a large flow event.

Source: Texas Low Water Crossing Inventory_032312

Dams

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

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



Source: FEMA- Benefits of Dams

The following is a list of the dams in Hood County provided by the United States Army Corps of Engineers. Those without a city name can be presumed to be located in the unincorporated Hood County. The list reflects the most current 2018 National Inventory of Dams (NID) database. State and federal dam regulators provided their data from May to November 2018 for inclusion in the 2018 database.

Please contact the respective state or federal regulatory authority for the most up-to-date information. The NID consists of dams meeting at least one of the following criteria, though to protect the sensitivity of the dams the criteria will not be identified for each dam:

1. High hazard potential classification - loss of human life is likely if the dam fails.
2. Significant hazard potential classification - no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns.
3. Height is equal to or exceeds 25 feet and storage exceeds 15 acre-feet.
4. Height exceeds 6 feet and storage is equal to or exceeds 50 acre-feet.

	Dam Name	Jurisdiction	Owner	EAP
1	SEALS LAKE DAM		WA SEALS	NR
2	FAULKNER DAM	GLEN ROSE	CJ DAVIDSON	NR
3	BULLMAN POND DAM		LELAND HODGES	NR
4	DE CORDOVA BEND DAM	RAINBOW	BRAZOS RIVER AUTHORITY	Y
5	JB RANDLE DAM		WALKER RANDLE	NR
6	RUCKERS CREEK WS SCS SITE 1 DAM	NONE	BRAZOS VALLEY SWCD; HOOD COUNTY	NR
7	BLACK LAKE DAM		JR BLACK ESTATE CLYDE WELLS	NR
8	ENGLER LAKE DAM	LIPAN	JAMES MOYER	N
9	NORTH CRITES DAM	GLEN ROSE	LELAND HODGES	NR
10	ELLAINE GRANDE RANCH LAKE DAM		TOMMIE BROYLES	NR

	Dam Name	Jurisdiction	Owner	EAP
11	STARR HOLLOW LAKE DAM	GRANBURY	MARVIN LEONARD FAMILY TRUST	Y
12	COMANCHE HARBOR LAKE DAM	GRANBURY	COMANCHE HARBOR OWNERS ASSOCIATION ET AL	Y
13	PALUXY RIVER WS SCS SITE 16 DAM	NONE	BRAZOS VALLEY SWCD; HOOD COUNTY	NR
14	BLACK LAKE NO 2 DAM		JOHN R BLACK ESTATE	NR
15	BLACK LAKE NO 3 DAM		JOHN R BLACK ESTATE	NR
16	BLACK LAKE NO 4 DAM		JOHN R BLACK ESTATE	NR
17	BLACK LAKE NO 5 DAM		JOHN R BLACK ESTATE	NR
18	BLACK LAKE NO 6 DAM		JOHN R BLACK ESTATE	NR
19	BLACK LAKE NO 7 DAM		JOHN R BLACK ESTATE	NR
20	ALDENHOVEN LAKE DAM		CARL J ALDENHOVEN TRUST	NR
21	WALSH LAKE DAM		JIM WALSH	NR
22	TEXAS A & M LAKE DAM		CJ DAVIDSON ESTATE	NR
23	SMELLEY LAKE DAM		RICHARD SMELLEY	NR
24	BOWSER LAKE DAM		GW BOWSER	NR
25	BRADLEY LAKE DAM		JIMMY BRADLEY	NR
26	WESTERN RESORT DAM 2		OAK TRAIL OWNERS ASSOCIATION	NR

Source: National Inventory of Dams, https://nid-test.sec.usace.army.mil/ords/f?p=105:1

** An Emergency Action Plan (EAP) is a formal document that identifies potential emergency conditions at a dam and specifies actions to be followed to minimize loss of life and property damage. Under the EAP category, the following acronyms are used Y (Yes), N (No), or NR (Not Required)*

Environmental Protection Agency National Priorities List of Superfund Sites

Besides local critical facilities, some jurisdictions have national critical facilities that are monitored by the federal government, such as superfund sites. The Environmental Protection Agency's (EPA's) Superfund program is responsible for cleaning up some of the nation's most contaminated land and responding to environmental emergencies, oil spills, and natural disasters. To protect public health and the environment, the Superfund program focuses on making a visible and lasting difference in communities, ensuring that people can live and work in healthy, vibrant places. The EPA National Priorities List (NPL) is the list of sites of national priority among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The NPL is intended primarily to guide the EPA in determining which sites warrant further investigation.[6]

According to the list, there are no superfund sites in Hood County.

3.4.2 Historic Buildings and Districts

Historic landmarks and districts are important to consider when evaluating vulnerabilities to hazards. What is historic, and worth saving, varies with the beholder. "Historic" applies to a building that is part of

[6] Superfund: National Priority List (NPL). United States Environmental Protection Agency. <https://www.epa.gov/superfund/superfund-national-priorities-list-npl>

a community's tangible past. Due to the advanced of these structures, they are highly susceptible to cracking, leaning, and total destruction caused by any of the hazards.

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

According to the Texas Historic Sites Atlas, there are 44 cemeteries, 2 museums, and 78 historical markers throughout Hood County. There are also 3 national register properties, and 4 courthouses on the list.[7]

The Hood County Historical Commission and Hood County Historical Society are responsible for keeping the county's history alive.

3.4.3 Bodies of Water

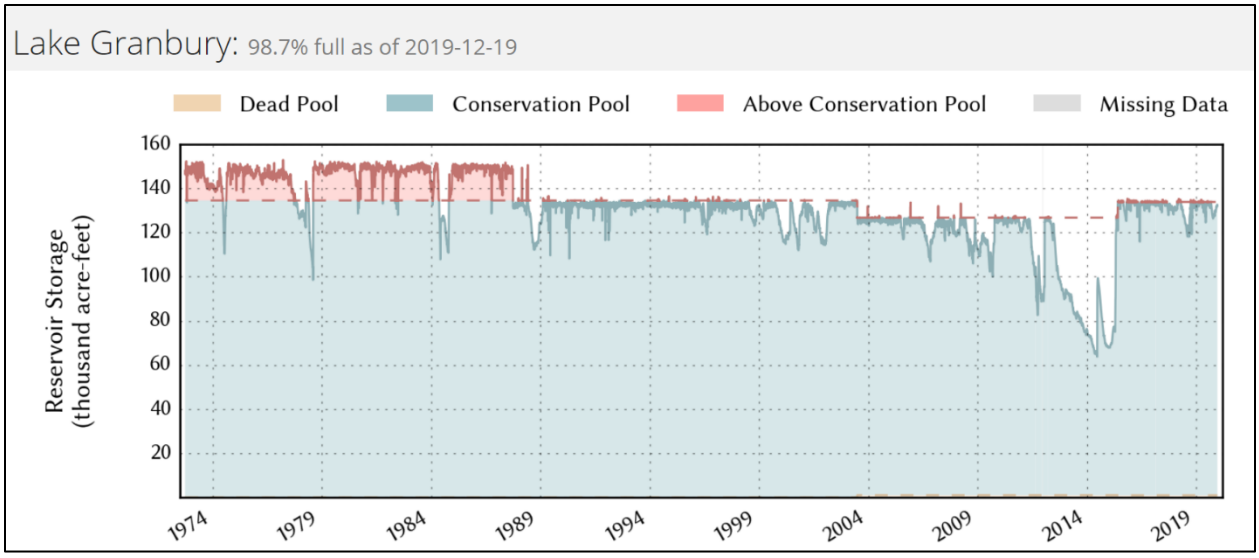
Granbury Lake

According to the Texas Water Development Board, Lake Granbury and De Cordova Bend Dam is located about 8.3 miles in southeast of Granbury in Hood County, on the Brazos River. The Brazos River Authority owns the lake and operates the facilities for municipal, industrial, irrigational supplies and recreational purposes. According to 2015 TWDB hydrometric survey, the top of the dam has an elevation of 706.5 feet. The emergence spillway is located in the left side of the dam and is controlled by 16 tainter gates (each 36 by 35 feet) with its crest (or sill of the gates) at elevation of 658 feet. Lake Granbury, characterized by its long and narrow water body, has a total capacity of 136,326 acre-feet and surface area of 8,281.6 acres at the conservation pool elevation or top of gates, 693 feet (based on information provided by the Brazos River Authority in 2016, all above elevations are measured based on local datum which is 1.

Reservoir	Percent Full	Water Level (ft)	Height Above Conservation Pool (ft)	Reservoir Storage (acre-ft)	Conservation Storage (acre-ft)	Conservation Capacity (acre-ft)	Surface Area (acres)
Granbury	98.7	692.48	-0.22	132,069	131,160	132,949	8,092

Source: Texas Water Development Board

[7] Texas Historical Sites Atlas. 2015. Texas Historical Commission. <https://atlas.thc.state.tx.us/>



The following list identifies all the lakes and reservoirs in the participating jurisdictions. Reservoirs are important for providing water supplies, particularly in a state with such variable streamflow. More than half of the available surface water in Texas is from reservoirs. Reservoirs are able to capture and store floodwaters for use during times of drought when the rivers are low or dry.

Name	United States Geological Survey Topographic Map
Aldenhoven Lake Dam	Tolar
Black Lake Number 7 Dam	Tolar
Bowser Lake Dam	Granbury
Bullman Pond Dam	Tolar
Comanche Harbor Lake Dam	Granbury
Faulkner Dam	Tolar
North Crites Dam	Tolar
Star Hollow Lake Dam	Tolar

Source: TX HomeTownLocator

The Brazos and Paluxy rivers are the main water sources in the county. The level of local water sources has a dramatic effect on the impact of drought and flooding in the participating jurisdictions.

3.4.4 Natural Environment and Federally Protected Species

The Texas Parks and Wildlife Department established a list of rare, threatened, and endangered species within Parker County. All species on the county list are tracked in the Texas Natural Diversity Database (TXNDD). Species include birds, fishes, mammals, mollusks, and reptiles.[8] The following species are listed as rare species living in Hood County:

[8] Texas Parks and Wildlife Department, Wildlife Division, Diversity and Habitat Assessment Programs. TPWD County Lists of Protected Species and Species of Greatest Conservation Need. Parker County. 30 December 2016.

Amphibians	Woodhouse's toad
Amphibians	Strecker's chorus frog
Amphibians	southern crawfish frog
Birds	white-faced ibis
Birds	wood stork
Birds	bald eagle
Birds	black rail
Birds	whooping crane
Birds	piping plover
Birds	mountain plover
Birds	Franklin's gull
Birds	interior least tern
Birds	western burrowing owl
Birds	black-capped vireo
Birds	golden-cheeked warbler
Mammals	tricolored bat
Mammals	big brown bat
Mammals	eastern red bat
Mammals	hoary bat
Mammals	Mexican free-tailed bat
Mammals	swamp rabbit
Mammals	thirteen-lined ground squirrel
Mammals	black-tailed prairie dog

Mammals	woodland vole
Mammals	long-tailed weasel
Mammals	mink
Mammals	American badger
Mammals	eastern spotted skunk
Mammals	plains spotted skunk
Mammals	western hog-nosed skunk
Mammals	mountain lion
Reptiles	western box turtle
Reptiles	smooth softshell
Reptiles	slender glass lizard
Reptiles	Texas horned lizard
Reptiles	Brazos water snake
Reptiles	common garter snake
Reptiles	Texas garter snake
Reptiles	massasauga
Insects	American bumblebee
Mollusks	Texas fawnsfoot
Plants	Hall's prairie clover
Plants	Comanche Peak prairie clover
Plants	Reverchon's scurfpea
Plants	Osage Plains false foxglove
Plants	Glen Rose yucca

Currently, there are no regional plans related to the future of North Texas' natural assets of habitat, plants, animals, open space areas and corridors, tree canopy, or carbon footprint. There are studies of particular topics that have been conducted for other purposes. For example, the Environmental Impact Statement of an individual project considers the project's impact on endangered species. Also, there are studies underway on particular topics but for smaller areas within the North Texas region.[9]

Under Chapter 12.0011 of the Texas Parks and Wildlife Code, Texas Parks and Wildlife Department (TPWD) is charged with "providing recommendations that will protect fish and wildlife resources to local, state, and federal agencies that approve, permit, license, or construct developmental projects" and "providing information on fish and wildlife resources to any local, state, and federal agencies or private organizations that make decisions affecting those resources." Project types reviewed by TPWD include reservoirs, highway projects, pipelines, urban infrastructure, utility construction, renewable energy, and residential and commercial construction, as well as many others.

[9] North Texas to 2030: Extending the Trends. Vision North Texas.

Each state in the U.S. has completed a Wildlife Action Plan or Comprehensive Wildlife Conservation Strategy to improve the stability and recovery of species which are in decline, already listed as threatened or endangered, and/or are representative of the diversity and health of the state's wildlife. To date, these plans have become important guides for natural resource management programs, conservation funding, partnership building, project development, and problem-solving at local and regional levels. TPWD is the steward of the Texas Conservation Action Plan, formerly called the Texas Comprehensive Wildlife Conservation Strategy 2005 - 2010 or Texas Wildlife Action Plan. This revised Texas plan (approved by the U.S. Fish and Wildlife Service in 2013) is a series of 11 regionally-specific Ecoregion handbooks, a Statewide/Multi-region handbook, and this Overview document. Collectively, they are now called the Texas Conservation Action Plan.

While the Texas Conservation Action Plan is a conservation plan for species at most at risk, its primary purpose is to bring people together to realize conservation benefits, prevent species listings, and preserve our natural heritage for future generations. Handbooks contain information on Species of Greatest Conservation Need, regionally important habitats, local conservation goals and projects, regional and statewide activities, contact information for conservation partners, and maps. The activities in each handbook are starting points to engage landowners, land-use planners, natural resources professionals, and the public in regional and local community-based conservation.[10]

3.4.5 Factors that Increase Vulnerability

Factors that decrease vulnerability to hazards include climate variability, population increase and demographics, repetitive loss properties, new development, and the wildland-urban interface.

Climate Variability

A key factor to an increase in vulnerability is climate variability, also known as climate change. According to the United States Environmental Protection Agency (EPA),

> Texas's climate is changing. Most of the state has warmed between one-half and one-degree Fahrenheit (°F) in the past century. In the eastern two-thirds of the state, average annual rainfall is increasing, yet the soil is becoming drier. Rainstorms are becoming more intense, and floods are becoming more severe... In the coming decades, storms are likely to become more severe, deserts may expand, and summers are likely to become increasingly hot and dry, creating problems for agriculture and possibly human health. Our climate is changing because the earth is warming. People have increased the amount of carbon dioxide in the air by 40% since the late 1700s. Other heat-trapping greenhouse gases are also increasing. These gases have warmed the surface and lower atmosphere of our planet about one degree during the last 50 years. Evaporation increases as the atmosphere warms, which increases humidity, average rainfall, and the frequency of heavy rainstorms in many places—but contributes to drought in others…[11]

[10] Texas Conservation Action Plan. Texas Parks & Wildlife.
< https://tpwd.texas.gov/Hoodwild/wild/wildlife_diversity/nongame/tcap/>
[11] What Climate Change Means for Texas. August 2016. EPA 430-F-16-045. United States Environmental Protection Agency.< https://archive.epa.gov/epa/sites/production/files/2016-09/documents/climate-change-tx.pdf>

The following is an article from the Dallas Morning News that describes the effects of climate change specifically in North Central Texas:

> The United States has just come off a record year for weather and climate disasters and, by most accounts, it's only going to get worse.
>
> Last year hurricanes Harvey, Irma, and Maria; the wildfires and floods in California; and tornado outbreaks in the Midwest and the South delivered $306.2 billion in damages, more than any year in history when adjusted for inflation.
>
> Texas is particularly vulnerable to a changing climate. It has had more costly weather-related disasters than any other state, and those events will happen more often as air and ocean temperatures climb, scientists say.
>
> "Climate change is not just about polar bears," said Katharine Hayhoe, a climate scientist at Texas Tech University with an impressive YouTube following. "It will affect North Texas profoundly."
>
> Between 2041 and 2050, Dallas-Fort Worth may see August temperatures rise from a mean of 86 °F at the end of the 20th century to 94 °F, with extremes rising above 120, reports one study by scientists at the University of Texas at Arlington.
>
> Longer droughts and more extreme rainstorms will pose a challenge for those who manage drinking water supplies, those who raise cattle, and those who oversee our roads and railways.
>
> The changes may also have unexpected effects on people's daily lives, including jobs. Intense heat can imperil cars and airplanes, evaporate drinking water supplies, and halt outdoor labor such as farm work and construction.
>
> Adam Smith, a scientist with the federal government's main climate agency, the National Oceanic and Atmospheric Administration, calls Texas "the disaster capital of the United States."
>
> As Smith explains, Texas is susceptible to almost every kind of weather and climate hazard, from extreme cold to extreme heat, from severe drought and wildfires to torrential floods. Texas is also home to a booming population and critical infrastructure, including the petrochemical plants that were damaged in Hurricane Harvey.
>
> "Texas is a hot-spot for a wide range of extreme natural events due to its geography," said Smith. "We expect many of these extremes to become more frequent and intense as time moves forward."
>
> While uncertainty is built into climate models, scientists have a high degree of confidence in many of the changes they observe and predict.
>
> The bigger, longer and more common an event is, the greater the accuracy with which scientists can project how climate change will impact it, said Hayhoe, a lead author of a November 2017 climate change report overseen by scientists at 13 federal agencies. Larger events have more data associated with them and can be easier to model.

Researchers are very confident that climate change will increase both average and extreme temperatures. They are also confident that climate change is likely to increase the risk of heavy precipitation in many areas and may bring stronger droughts to the south-central and southwestern parts of the U.S.

Projected impacts on smaller-scale events like tornadoes and hailstorms are less well understood.

One area of consensus is the cause of climate change. "It is extremely likely that human activities, especially emissions of greenhouse gases, are the dominant cause of the observed warming since the mid-20th century," note the authors of the Fourth National Climate Assessment, a Congressionally mandated review that scientists conduct every four years. They add that there are no convincing alternative explanations.

Below is how these changes will affect our area, the evidence behind the projections, and how confident scientists are in each of these findings.

Heat

More record-setting heat in North Texas is a virtual certainty. Already, we are living through the warmest period in the history of modern civilization, the federal report found, and that warming will accelerate.

Climate science contrarians often attack the models on which climate projections are based. Myron Ebell, who led President Donald Trump's transition team at the Environmental Protection Agency, accepts that humans are most likely responsible for warming, but he says models have exaggerated the outcome. Ebell is director of the Center for Energy and Environment at the Competitive Enterprise Institute, a libertarian advocacy group based in Washington, D.C. He acknowledges that he is not a scientist.

In fact, researchers have used models to predict global temperature changes for more than 50 years, and the models' projections have been fairly accurate over the long term. In the early 21st century, a discrepancy appeared between observed and modeled temperatures-a period dubbed the "global warming slowdown" or "hiatus."

Scientists have published scores of studies on the mismatch and tied it to several factors that contributed to lower-than-expected observed temperatures. Those factors include a series of small volcanic eruptions, the cooling effects of which scientists had underestimated, and lower than expected solar output.

Findings from those studies are helping to improve climate model simulations and helping scientists better understand why there are differences between simulations and observations in the early 21stcentury, said Ben Santer, a climate scientist at the Lawrence Livermore National Laboratory.

Global average temperatures increased about 1.8 degrees Fahrenheit in the last 115 years. In Dallas, they climbed from about 65 °F during the early part of the 20th century to 68 °F during the most recent decade. If nothing is done to reduce emissions of carbon dioxide and other greenhouse gases, average temperatures in the city may reach the low 70s by 2050 and surpass 75°F by the end of the century.

Earlier this year, Amir Jina and colleagues published a study in the journal *Science* that estimated economic damage from climate change in each county of the United States.

Once temperatures reach the high 90s, equal to or above body temperature, fatality rates go up.

Besides people, heat also affects roads. A 2015 study by the University of Texas at Arlington (UTA) that focused on the impact of climate change on transportation predicted "an increase in wildfires along paved highways, heat-induced stress on bridges and railroads, air-conditioning problems in public transport vehicles and heat-related accidents by failure of individual vehicles and heat-related stress."

The study concluded, "These impacts can be translated into substantial mobility and economic loss."

Drought

Along with heat will come stronger drought, which "has profound economic impacts," said Hayhoe.

The prediction that North Texas will have longer and more severe droughts is based on multiple factors, including the relationship between high temperatures and soil dryness and the presence of more frequent and longer lasting high-pressure systems in summer that suppress rainfall and deflect storms away from our area.

Hayhoe points to Texas' 2010-2013 drought as a probable sign of things to come. Although this drought occurred naturally, as a result of a strong La Niña event that typically brings dry conditions to our area, it was exacerbated by extreme heat. That event created severe hay shortages for cattle farmers and led some ranchers to prematurely slaughter their herds or export them out of state.

"Cotton can be drought-resistant, but not cattle," said Hayhoe.

The 2015 UTA study predicts a reduction in soil moisture of 10% to 15% in all seasons by 2050, which can also lead to cracked pavement and the premature loss of roads, railways, and other infrastructure.

Heat and drought also pose a problem for drinking water supplies, which North Texas sources from surface reservoirs that will be increasingly prone to evaporation. Hayhoe says some water managers are considering pumping the reservoirs underground during exceptionally hot and dry conditions, or covering them with polymer "blankets."

The blankets are an invisible layer of organic molecules that can help reduce evaporation.

Floods

While it's not likely that annual precipitation totals will change in North Texas, rainfall patterns likely will. Hayhoe and Nielsen-Gammon both say we will likely see enhanced "feast or famine" cycles with torrential rainstorms in the spring followed by longer than usual dry periods.

These predictions carry a high degree of certainty, because climatologists have already recorded this trend playing out.

"Rainfall becoming more extreme is something we expect because we've observed this not just in North Texas but throughout the United States, and models consistently predict it will continue to happen," said Nielsen-Gammon.

Severe rainstorms, the UTA scientists predict, will have the capacity to flood highway exit and service roads in the Federal Emergency Management Agency (FEMA) 100-year floodplain.

"While the state highway system was built above flooding levels, the connector roads may be easily flooded," said Arne Winguth, a climate scientist at UTA who co-authored the report.

Tornadoes and hail

Two events climate scientists cannot reliably project are hailstorms and tornadoes. "A lot of the things we care about are too small-scale to predict with more confidence," said Nielsen-Gammon. "The historical record is not large enough for longer-term forecasts."

There is some evidence that tornadoes, like rainstorms, are becoming more concentrated on fewer days and that their season has become less predictable.

The same is true with hail. "One thing we expect to happen with a warming climate is that the average humidity in the lower atmosphere may decrease, and if that happens it's easier for hail to stay frozen," said Nielsen-Gammon. "That factor might increase hailstorms, but that's just one of many factors that do affect hail."

Economy

Jina of the University of Chicago predicted in his study that climate change would decrease Dallas County's annual income by 10% to 20% in the coming decades unless emissions are reduced. "North Texas is one of the worst-affected places in the country," he said. Much of the loss comes from higher mortality rates, soaring air-conditioning costs, and reduced labor productivity.

To track labor productivity, Jina and his colleagues examined national time-use surveys, diaries kept by thousands of volunteers across the country, and compared them with local weather data. He found that on extremely hot days, people tended to stop working about 30 minutes early.

"There's direct evidence that people concentrate less well, make more mistakes and their brain just functions less efficiently if it's too hot," he said. Heat also disrupts sleep. "The general lack of productivity leads to them saying, 'No more work today.'"

The good news is that many climate-change effects are manageable. They do require local and federal authorities to plan ahead and take action, said Smith of the National Oceanic and Atmospheric Administration.

"It is important," he said, "to address where we build, how we build and also to build protections for populations already exposed in vulnerable areas."[12]

All participating jurisdictions are experiencing the effects of climate variability.

Population Increase and Demographics

The entire planning areas of the participating jurisdictions, including their populations, are vulnerable to the damaging effects of most of the natural hazards identified. The 2030 population projections produced by the North Central Texas Council of Governments (NCTCOG) use the year 2000 as a base year and project population and employment in five-year increments to 2030. Over the 30-year horizon, the 16-county North Texas region is anticipated to add 1.6 million households with a corresponding 4.1 million people and 2.3 million non-construction jobs. This represents an average annual population growth rate of 2.6% for these 30 years, a magnitude of growth never before experienced in the North Central Texas region. NCTCOG forecasts reflect only one set of growth assumptions. If circumstances change, real growth outcomes might be considerably different.[13]

Population growth and distribution, especially increased population density and urbanization, increases vulnerability to disasters.[14] The elderly, very young, those without air conditioning or heating, and outdoor laborers are most at risk to the effects of extreme heat and winter storms. Residents living in a floodplain are most at risk to flooding and residents living in the Wildland-Urban Interface (WUI) are most at risk to wildfires. Those living in poverty and in homes not built using enhanced building codes are most susceptible to the damages of these hazards.

The following table reflects the **estimated** changes in participating jurisdictions' demographics, gathered by the North Central Texas Council of Governments, since the adoption of the 2015 HazMAP. Lipan and Toalr were not in the 2015 HazMAP. Population estimates for Hood County refers to the entire county, not just the unincorporated portion.

Jurisdiction	2012 Population Estimate	2015 Population Estimate	2019 Population Estimate
Cresson	742	782	1,029
Granbury	8,100	8,940	9,790
Lipan*	430	449	481
Tolar*	709	820	956
Hood County	56,770	64,400	65,960

Source: North Central Texas Regional Data Center, US Census, and World Population Review.

[12] Climate change to bring North Texas longer droughts, heavy rains, 120-degree temps within 25 years. Kuchment, Anna. 2018, February 15. <https://www.dallasnews.com/news/climate-change-1/2018/02/15/climate-change-to-bring-texas-longer-droughts-heavy-rains-120-temps-august-within-25-years>

[13] North Texas to 2030: Extending the Trends. Vision North Texas.

[14] Ben Wisner et al., At Risk: Natural Hazards, People's Vulnerability, and Disasters, 2d ed. (London: Routledge, 2004).

In the context of emergencies, vulnerable groups may include individuals with disabilities, pregnant women, children, elderly persons, prisoners, certain members of ethnic minorities, people with language barriers, and the impoverished. For these populations, emergency response failures can have catastrophic consequences, including loss of the ability to work or live independently, permanent injury, and death. Without appropriate preparation, vulnerable individuals may not be able to evacuate as instructed, reach points of distribution for medical countermeasures, understand written or verbal communications during an emergency, or find suitable housing if their residences are destroyed during a disaster.

The community profiles of the participating jurisdictions are identified in the following table. Note that the US Census did not have all data for jurisdiction with a population less than 5,000. The Hood County column of numbers includes all jurisdictions (not just participating jurisdictions) and the unincorporated portion of the county.

Community Profile					
Topic	**Cresson**	**Granbury**	**Lipan**	**Tolar**	**Hood County**
Persons under 5 years (%)	Unknown	7.2%	Unknown	Unknown	5.6%
Persons 65 years and over (%)	Unknown	30.4%	Unknown	Unknown	24.6%
Language other than English spoken at home (%)	Unknown	9.1%	Unknown	Unknown	9.7%
With a disability, under age 65 (%)	Unknown	6.7%	Unknown	Unknown	7.2%
Persons without health insurance, under age 65 (%)	17.9%	16.2%	25.1%	8.3%	17.5%
Persons in poverty (%)	22.8%	11.2%	10%	10.5%	10.2%
Median household income	$68,472	$45,380	$55,667	$70,208	$59.049
Total housing units	358	3,996	189	311	21,969
Median housing value	$105,200	$171,700	$87,300	$145,000	$180,900
Percent of households with a broadband Internet subscription	89.1%	77.1%	71.4%	77.5%	82.1%

Source: US Census Bureau Quick Facts, www.census.gov.

New technologies that provide 9-1-1 and public safety officials with the ability to proactively engage the community have had a dramatic effect on mortality rates during these increasing amounts and strength of natural disasters.

Identifying at risk populations and providing them with information and assistance when they most need it can make a significant difference, especially in the event of an evacuation or seeking shelter. One measure of the strength of a community's response and recovery system is its attentiveness to its most vulnerable citizens. It is a cruel fact: disasters discriminate.

Repetitive Loss Properties

Among the National Flood Insurance Policy (NFIP) policyholders are thousands whose properties have flooded multiple times. Called "repetitive loss properties," these are buildings and/or contents for which the NFIP has paid at least two claims of more than $1,000 in any 10-year period since 1978. "Severe repetitive loss properties" are those for which the program has either made at least four payments for buildings and/or contents of more than $5,000 or at least two building-only payments that exceeded the value of the property.

These two kinds of properties are the biggest draw on the NFIP Fund. They not only increase the NFIP's annual losses and the need for borrowing; but they drain funds needed to prepare for catastrophic events. Community leaders and residents should also be concerned with the Repetitive Loss problem because residents' lives are disrupted and may be threatened by the continual flooding.

The primary objective of identifying these properties is to eliminate or reduce the damage to property and the disruption to life caused by repeated flooding of the same properties.

The following table reflects the loss statistics for repetitive loss properties in participating jurisdictions.

Loss Statistics: from January 1, 1978 through report as of September 30, 2018					
Jurisdiction	**Total Losses**	**Closed Losses**	**Open Losses**	**Closed Without Payment (CWOP) Losses**	**Total Payments**
Cresson	-	-	-	-	-
Granbury	31	21	0	10	$720,867.75
Lipan	-	-	-	-	-
Tolar	-	-	-	-	-
Hood County*	112	75	1	36	$2,197,334.73
Total losses: All losses submitted regardless of the status.					
Closed losses: Losses that have been paid.					
Open losses: Losses that have not been paid in full.					
CWOP losses: Losses that have been closed without payment.					
Total Payments: Total amount paid on losses.					

Source: Claim Information by State, https://bsa.nfipstat.fema.gov/reports/1040.htm#48.

The tables below provide information about the repetitive loss and severe repetitive loss properties within the participating jurisdictions as of March 2019, as provided by the Federal Emergency Management Agency. More details about the properties are not available to the public.

Property Details									
Community Number	Mitigated?	Insured?	City	Flood Zone	Occupancy	Total Building Payment	Total Contents Payment	Losses	Total Paid
480356	No	Yes	Granbury	AE	Single Family	228,782.75	$4,917.72	3	$233,700.47
480356	No	No	Granbury	X	Single Family	$13,848.07	$-	2	$13,848.07
480356	No	No	Granbury	X	Single Family	$42,733.58	28,382.58	5	$71,116.16
480356	No	No	Granbury	X	Single Family	$79,436.11	12,891.79	2	$92,327.90
480356	No	No	Granbury	X	Single Family	$5,968.82	$206.96	2	$6,175.78
480356	No	Yes	Granbury	X	Single Family	$72,155.20	18,121.16	2	$90,276.36
480356	No	Yes	Granbury	X	Single Family	$48,277.64	16,576.71	2	$64,854.35
480356	No	No	Granbury	X	Single Family	$51,958.63	27,101.78	2	$79,060.41
480356	No	Yes	Granbury	AE	Single Family	$14,267.73	$-	2	$14,267.73
480356	Yes	No	Granbury	A	Single Family	219,132.55	$-	2	$219,132.55

New Development

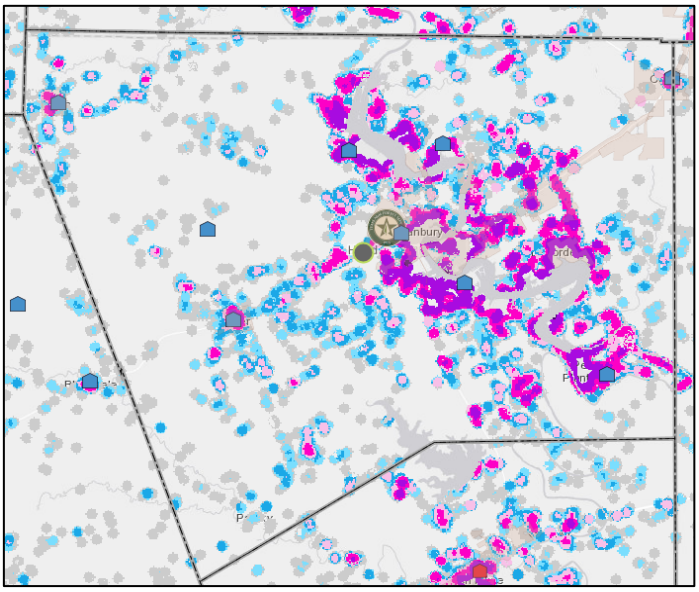
Unsustainable development is one of the major factors in the rising costs of natural disasters. Many mitigation design strategies and technologies serve double duty, by not only preventing or reducing disaster losses but serving the broader goal of long-term community sustainability. For example, land use regulations prohibiting development in flood-prone areas may also help preserve the natural and beneficial functions of floodplains. New development in hazard-prone areas increases the risk of damage and injury from that hazard. No participants have identified new developments in potentially hazard-prone areas.

Wildland-Urban Interface

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

The following map reflects the WUI areas in Hood County, with the locations of fire stations. The paid fire departments are marked in red and volunteer fire departments are marked in blue.

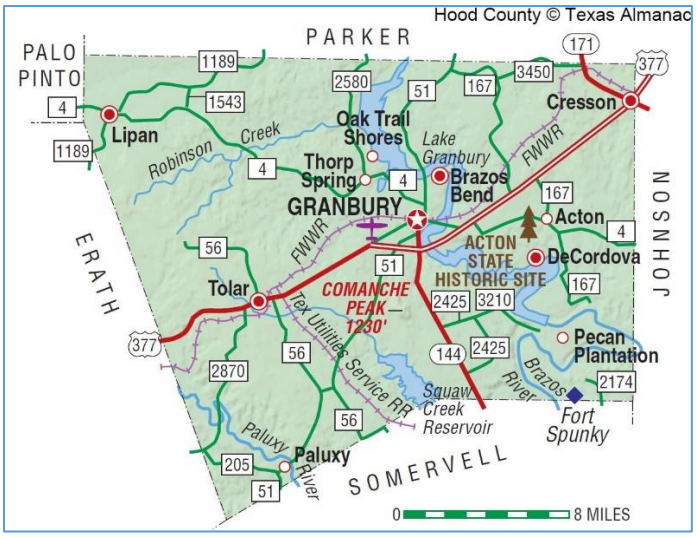
Hood County WUI Density Map



	No Data
	1-LT 1 hs/40 ac
	2-1 hs/40 to 1 hs/20 ac
	3-1 hs/20 to 1 hs/10 ac
	4-1 hs/10 to 1 hs/5 ac
	5-1 hs/5 to 1 hs/2 ac
	6-1 hs/2 to 3 hs/ac
	7-GT 3 hs/ac
*hs- house	
*ac- acre	

Source: Texas Wildfire Risk Assessment Portal Professional Viewer.

Map for Reference



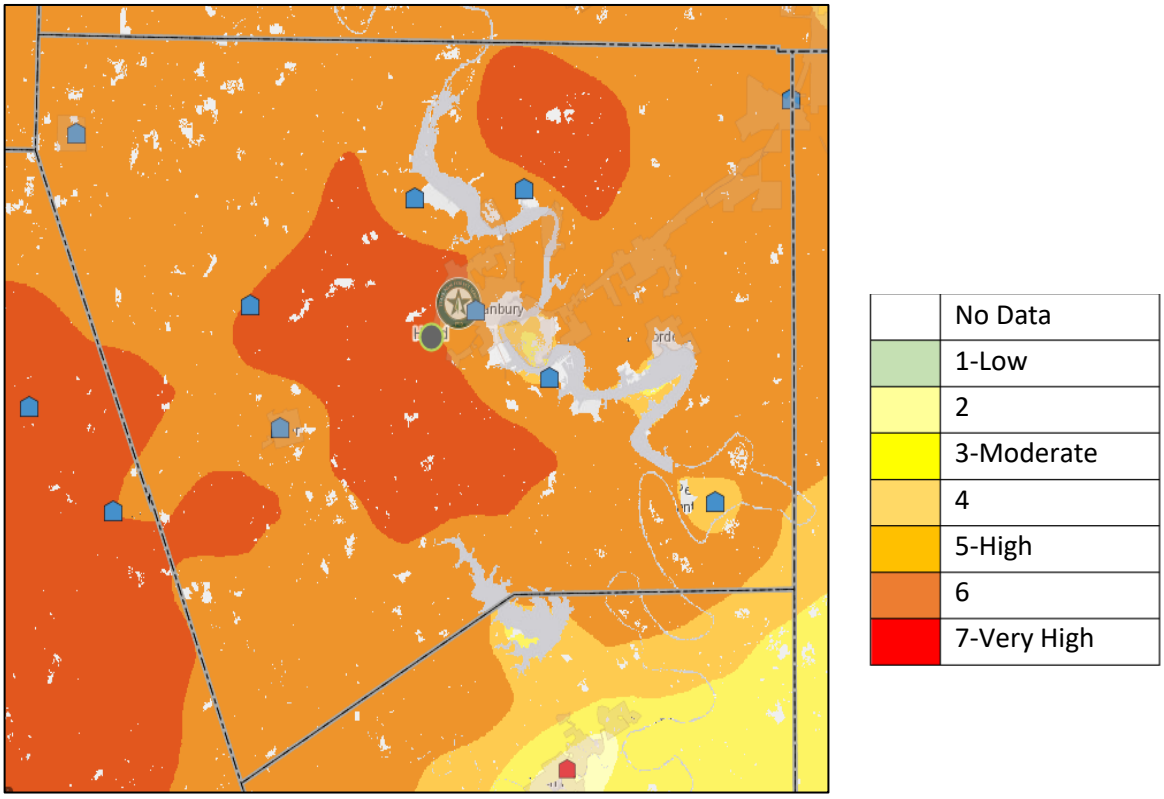
WUI housing density is categorized based on the standard Federal Register and United States Forest Service (USFS) Silvis data set categories. The number of housing density categories is extended to provide a better gradation of housing distribution to meet specific requirements of the states for their fire protection planning activities. While units of the data set are in houses per square kilometer, which is consistent with other data such as USFS SILVIS, the data is presented as the number of houses per acre to aid with interpretation and use in Texas.

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

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

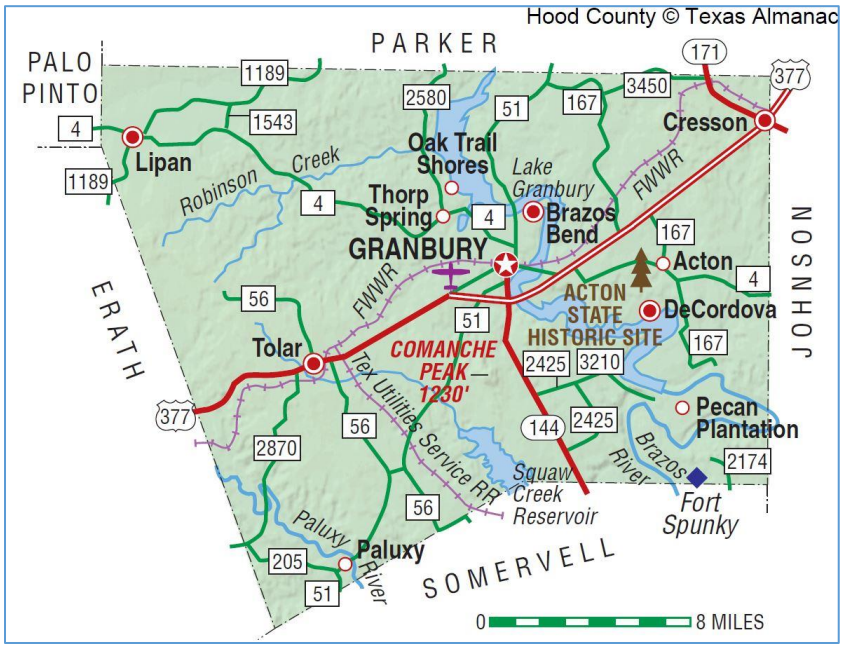
The following map shows the threat level of wildfires in Hood County, with the locations of fire stations. The paid fire departments are marked in red and volunteer fire departments are marked in blue.

Hood County Wildfire Threat Map



Source: Texas Wildfire Risk Assessment Portal Professional Viewer.

Map for Reference



3.4.6 Factors that Decrease Vulnerability

Factors that decrease vulnerability to hazards include the mitigation actions that have previously been implemented, the adoption of new codes and policies, and the participation in regional projects sponsored by the North Central Texas Council of Governments (NCTCOG) and other governing agencies.

Local Mitigation Actions

The participating jurisdictions have implemented a variety of mitigation actions to protect their communities from damaging disasters. These previous mitigation actions are described in detail in Chapter 4.

National Policy

On October 5, 2018, President Trump signed the Disaster Recovery Reform Act of 2018 (DRRA) into law as part of the Federal Aviation Administration Reauthorization Act of 2018. These reforms acknowledge the shared responsibility of disaster response and recovery, aim to reduce the complexity of FEMA and build the nation's capacity for the next catastrophic event. The law contains more than 50 provisions that require FEMA policy or regulation changes for full implementation, as they amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act. It has yet to be seen how the DRRA will be implemented and how it will impact state and local agencies, but highlights from the DRRA include:

Highlights from the DRRA include:

- **Greater investment in mitigation, before a disaster:** Authorizing the National Public Infrastructure Pre-Disaster Hazard Mitigation Grant Program, which will be funded through the Disaster Relief Fund as a six percent set aside from disaster expenses.
    - This program will focus on funding public infrastructure projects that increase community resilience before a disaster occurs.
    - Previously, funding for pre-disaster mitigation grants relied on congressional appropriations which varied from year to year. Now, with a reliable stream of sufficient funding, communities will be able to plan and execute mitigation programs to reduce disaster risk nationwide.
    - According to a 2017 National Institute of Building Sciences report, the nation saves six dollars in future disaster costs for every one dollar invested in mitigation activities.
- **Reducing risk from future disasters after fire:** Providing hazard mitigation grant funding in areas that received Fire Management Assistance Grants as a result of wildfire. Adding fourteen new mitigation project types associated with wildfires and windstorms.
- **Increasing state capacity to manage disaster recovery:** Allowing for higher rates of reimbursement to state, local and tribal partners for their administrative costs when implementing public assistance (12 percent) and hazard mitigation projects (15 percent). Additionally, the legislation provides flexibility for states and tribes to administer their own post-disaster housing missions, while encouraging the development of disaster housing strategies.
    - States, tribes, territories and local governments bear significant administrative costs implementing disaster recovery programs. Often these costs can be high and substantially burdensome for the impacted entity to meet. Increasing the funding for administrative costs will enable faster, more effective delivery of vital recovery programs to communities.
    - State and tribal officials have the best understanding of the temporary housing needs for survivors in their communities. This provision incentivizes innovation, cost containment and prudent management by providing general eligibility requirements while allowing them the flexibility to design their own programs.
- **Providing greater flexibility to survivors with disabilities:** Increasing the amount of assistance available to individuals and households affected by disasters, including allowing accessibility repairs for people with disabilities, without counting those repairs against their maximum disaster assistance grant award.
- **Retaining skilled response and recovery personnel:** Authorizing FEMA to appoint certain types of temporary employees who have been with the agency for three continuous years to full time positions in the same manner as federal employees with competitive status. This allows the agency to retain and promote talented, experienced emergency managers.

National Flood Insurance Program

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

Emergency Program: Entry-level participation phase.

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

**Initial flood hazard identification*

Regular Program: Most participating communities are in this phase.

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

The following table includes the NFIP status of the participating jurisdictions.

Community Name	CID	County	Initial FHBM Identified	Initial FIRM Identified	Current Effective Map Date	Reg-Emer Date	Tribal
Cresson	480177B	Parker/ Johnson/ Hood	-	09/27/91	04/05/19(M)	11/07/07	No
Granbury	480357B	Hood	07/09/76	01/15/88	04/05/19	01/15/88	No
Lipan	481075#	Hood	10/29/76	10/01/09	08/16/12(M)	10/01/09	No
Tolar	480868#	Hood	07/18/75	08/16/12	08/16/12(M)	08/16/12	No
Hood County	480356B	Hood	10/18/77	10/18/88	04/05/19	10/18/88	No
CID: A different community identification number is assigned for the incorporated city versus the unincorporated county.							
Community Name: The incorporated city or unincorporated county, parish, or borough.							
County: This column should match the relative incorporated city, township, village, or other entity.							
Init FHBM Identified: This date tells when the Flood Hazard Boundary Map was created. This map is only a factor in communities that do not have a Flood Insurance Rate Map.							

Init FIRM Identified: This date represents the community's first Flood Insurance Rate Map, and it is important because it represents the dividing line between two building categories called Pre-FIRM and Post-FIRM.
Current Effective Map Date: This is the date of the map currently in effect.
Reg-Emer Date: The date the community first joined the NFIP. An "E" next to the date indicates that the community is in the Emergency Program and subject to limited coverage. If there is no "E" next to the date, then the community participates in the Regular Program.
Tribal: A "yes" in this column indicates that the participating community is a tribal nation.
NSFHA: A 'Non-Special Flood Hazard Area' is an area that is in a moderate-to-low risk flood zone (Zones B, C, X Pre- and Post-FIRM)

Source: FEMA Community Status Book Report, http://www.fema.gov/cis/TX.html.

Jurisdictions participating in the NFIP are required to regulate any development in designated flood prone areas. In Hood County, all work within a Federal Emergency Management Agency (FEMA) designated floodplain requires a floodplain permit.

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

Policy Statistics as of 09/30/2018			
Jurisdiction	**Policies In-force**	**Insurance In-force (whole $)**	**Written Premium In-force**
Cresson	-	-	-
Granbury	86	$22,640,600	65,072
Lipan	1	$140,000	285
Tolar	3	$296,200	3,258
Hood County	435	$110,625,200	277,296

Source: FEMA Policy Statistics Country-Wide, https://bsa.nfipstat.fema.gov/reports/1011.htm.

Community Rating System

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

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

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

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

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

According to the April 2018 NFIP Flood Insurance Manual, there are no CRS communities amongst the participating jurisdictions in this hazard mitigation action plan.

The following table describes NFIP compliance within the participating jurisdictions.

NFIP Topic	Source of Information
How many structures are exposed to flood risk within the community?	Community Floodplain Administrator (FPA)
Cresson- None	
Granbury- None	
Lipan- None	
Tolar- Data unavailable	
Hood County- 439 policies	
Describe any areas of flood risk with limited NFIP policy coverage	Community FPA and FEMA Insurance Specialist
Cresson- None	
Granbury- None	
Lipan- None	
Tolar- Data unavailable	
Hood County- Rural Zone A	
Is the Community FPA or NFIP Coordinator certified?	Community FPA
Cresson- No	
Granbury- No	
Lipan- No	
Tolar- No	
Hood County- No	
Is floodplain management an auxiliary function?	Community FPA

Cresson- No	
Granbury- Yes	
Lipan- No	
Tolar- No	
Hood County- Yes	
Provide an explanation of NFIP administration services (e.g. permit review, GIS, education or outreach, inspections, engineering capability)	Community FPA
Cresson- Data unavailable	
Granbury- Permit review and GIS	
Lipan- Data unavailable	
Tolar- Data unavailable	
Hood County- Permit review, inspections, education	
What are the barriers to running an effective NFIP program in the community, if any?	Community FPA
Cresson- Data unavailable	
Granbury- None	
Lipan- Data unavailable	
Tolar- Data unavailable	
Hood County- The county is mostly a rural	
Is the community in good standing with the NFIP?	State NFIP Coordinator, FEMA NFIP Specialist, community records
Cresson- No	
Granbury- Yes	
Lipan- Yes	
Tolar- Data unavailable	
Hood County- Yes	
Are there any outstanding compliance issues (i.e. current violations)?	State NFIP Coordinator, FEMA NFIP Specialist, community records
Cresson- No	
Granbury- No	
Lipan- No	
Tolar- No	
Hood County- Data unavailable	
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	State NFIP Coordinator, FEMA NFIP Specialist, community records
Cresson- Data unavailable	
Granbury- January 2019	
Lipan- Data unavailable	
Tolar- Data unavailable	
Hood County- Data unavailable	

Is a CAV or CAC scheduled or needed?	State NFIP Coordinator, FEMA NFIP Specialist, community records
Cresson- No	
Granbury- No	
Lipan- No	
Tolar- Data unavailable	
Hood County- No	
Are the FIRMs digital or paper?	Community FPA
Cresson- Digital	
Granbury- Both	
Lipan- Digital	
Tolar- Data unavailable	
Hood County- Both	
Do floodplain development regulations meet or exceed FEMA or state minimum requirements? If so, in what ways?	Community FPA
Cresson- Yes	
Granbury- Yes	
Lipan- Yes	
Tolar- Data unavailable	
Hood County- Yes	
Provide an explanation of the permitting process.	Community FPA, State, FEMA NFIP
Cresson- Data unavailable	
Granbury- Permit Procedures: (1) Application for a floodplain development permit shall be presented to the floodplain administrator on forms furnished by him/her and may include, but not be limited to, plans in duplicate drawn to scale showing the locations, dimensions, and elevation of proposed landscape alterations, existing and proposed structures, including placement of manufactured homes and the location of the foregoing in relation to areas of special flood hazard. Additionally, the following information is required: (A) Elevation (in relation to mean sea level) of the lowest floor (including basement) of all new and substantially improved structures; (B) Elevation in relation to mean sea level to which any nonresidential structure shall be floodproofed; (C) A certificate from a registered professional engineer or architect that the nonresidential floodproofed structure shall meet the floodproofing criteria of section 3.10.008(b)(2); (D) Description of the extent to which any watercourse or natural drainage will be altered or relocated as a result of proposed development; and (E) Maintain a record of all such information in accordance with subsection (b)(1) above. (2) Approval or denial of a development permit by the floodplain administrator shall be based on all of the provisions of this article and the following relevant factors: (A) The danger to life and property due to flooding or erosion damage; (B) The susceptibility of the proposed facility and its contents to flood damage	

and the effect of such damage on the individual owner; (C) The danger that materials may be swept onto other lands to the injury of others; (D) The compatibility of the proposed use with existing and anticipated development; (E) The safety of access to the property in times of flood for ordinary and emergency vehicles; (F) The costs of providing governmental services during and after flood conditions including maintenance and repair of streets and bridges, and public utilities and facilities such as sewer, gas, electrical, and water systems; (G) The expected heights, velocity, duration, rate of rise and sediment transport of the floodwaters and the effects of wave action, if applicable, expected at the site; (H) The necessity to the facility of a waterfront location, where applicable; (I) The availability of alternative locations, not subject to flooding or erosion damage, for the proposed use; and (J) The relationship of the proposed use to the comprehensive plan for that area.
Lipan- Data unavailable
Tolar- Data unavailable
Hood County- Data unavailable

3.4.7 Greatest Vulnerabilities

Below is a list of the participating jurisdictions greatest vulnerabilities in relation to natural hazards.

Cresson	• Loss of electrical service • Access to subdivisions could be jeopardized or impeded. • Loss of electricity for the water pump system
Granbury	• A large event would quickly overwhelm local resources.
Lipan	• Structure loss or damage to water treatment/wells or City Hall.
Tolar	• Loss of the water well system and not having a surface water system available. • Sewer system facilities are all above ground.
Hood County Unincorporated	• A large event would quickly overwhelm local resources.

3.5 Historical Events

This section shows historical events and damage for the following natural hazards in Hood County since the 2015 HazMAP:

- Drought
- Earthquakes
- Expansive Soils
- Extreme Heat
- Flooding (including dam failure)
- Thunderstorms (including hail, wind, and lightning)

- Tornadoes
- Wildfires
- Winter Storms

Weather Events

The following tables identify the weather events (drought, extreme heat, flooding, thunderstorms, tornadoes, and winter storms), captured by the National Weather Service (NWS), that have occurred from 2012-2018 in the participating jurisdictions or the Hood County Zone. Damages are recorded in $US.

The National Centers for Environmental Information (NCEI) receives storm data from the NWS. The NWS receives their information from a variety of sources, which include but are not limited to: county, state and federal emergency management officials, local law enforcement officials, SkyWarn spotters, NWS damage surveys, newspaper clipping services, the insurance industry, and the general public, among others. NWS Storm Data are geographically categorized by county or by NWS Forecast Zone. Localized events such as a tornado, thunderstorm winds, flash floods, and hail are categorized using the *Hood Co.* (County) designation. More widespread events that can impact the entire county equally, such as heat, cold, drought, floods, and winter weather, are categorized using the *Hood (Zone)*.

There have been no NWS reports of extreme heat within the participating jurisdictions.

Due to the climate variability and increasing populations, it is expected that the same level of damage experienced in the past will occur in the future, if not more, for each event.

The following abbreviations from the column headings for all weather tables are explained below:
'Mag': Magnitude, **'Dth':** Deaths, **'Inj':** Injuries, **'PrD':** Property Damage ($), **'CrD':** Crop Damage ($)

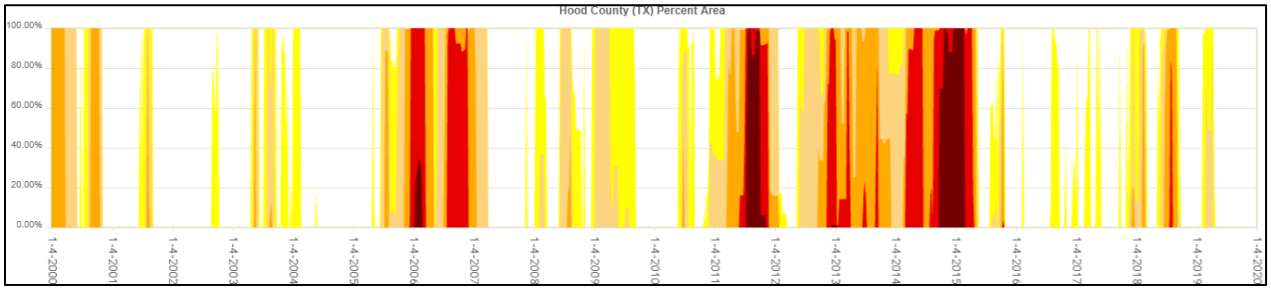
The following weather events are listed in alphabetical order.

Drought									
Location	County/Zone	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
HOOD (ZONE)	HOOD (ZONE)	09/25/2012	00:00	Drought		0	0	0.00K	0.00K
HOOD (ZONE)	HOOD (ZONE)	10/01/2012	00:00	Drought		0	0	0.00K	2.00K
HOOD (ZONE)	HOOD (ZONE)	11/01/2012	00:00	Drought		0	0	0.00K	5.00K
HOOD (ZONE)	HOOD (ZONE)	12/01/2012	00:00	Drought		0	0	0.00K	2.00K
HOOD (ZONE)	HOOD (ZONE)	01/01/2013	00:00	Drought		0	0	0.00K	3.00K
HOOD (ZONE)	HOOD (ZONE)	02/01/2013	00:00	Drought		0	0	0.00K	1.00K
HOOD (ZONE)	HOOD (ZONE)	03/01/2013	00:00	Drought		0	0	3.00K	0.00K
HOOD (ZONE)	HOOD (ZONE)	04/01/2013	00:00	Drought		0	0	0.00K	2.00K
HOOD (ZONE)	HOOD (ZONE)	05/01/2013	00:00	Drought		0	0	0.00K	3.00K
HOOD (ZONE)	HOOD (ZONE)	06/01/2013	00:00	Drought		0	0	0.00K	2.00K

Drought									
Location	County/Zone	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
HOOD (ZONE)	HOOD (ZONE)	07/01/2013	00:00	Drought		0	0	0.00K	2.00K
HOOD (ZONE)	HOOD (ZONE)	08/01/2013	00:00	Drought		0	0	0.00K	3.00K
HOOD (ZONE)	HOOD (ZONE)	09/01/2013	00:00	Drought		0	0	0.00K	3.00K
HOOD (ZONE)	HOOD (ZONE)	10/01/2013	00:00	Drought		0	0	0.00K	2.00K
HOOD (ZONE)	HOOD (ZONE)	11/01/2013	00:00	Drought		0	0	0.00K	3.00K
HOOD (ZONE)	HOOD (ZONE)	12/01/2013	00:00	Drought		0	0	0.00K	1.00K
HOOD (ZONE)	HOOD (ZONE)	02/25/2014	00:00	Drought		0	0	0.00K	1.00K
HOOD (ZONE)	HOOD (ZONE)	03/01/2014	00:00	Drought		0	0	0.00K	7.00K
HOOD (ZONE)	HOOD (ZONE)	04/01/2014	00:00	Drought		0	0	0.00K	3.00K
HOOD (ZONE)	HOOD (ZONE)	05/01/2014	00:00	Drought		0	0	0.00K	2.00K
HOOD (ZONE)	HOOD (ZONE)	06/01/2014	00:00	Drought		0	0	0.00K	1.00K
HOOD (ZONE)	HOOD (ZONE)	07/01/2014	00:00	Drought		0	0	0.00K	3.00K
HOOD (ZONE)	HOOD (ZONE)	08/01/2014	00:00	Drought		0	0	0.00K	3.00K
HOOD (ZONE)	HOOD (ZONE)	09/01/2014	00:00	Drought		0	0	5.00K	0.00K
HOOD (ZONE)	HOOD (ZONE)	10/01/2014	00:00	Drought		0	0	0.00K	5.00K
HOOD (ZONE)	HOOD (ZONE)	11/01/2014	00:00	Drought		0	0	0.00K	3.00K
HOOD (ZONE)	HOOD (ZONE)	12/01/2014	00:00	Drought		0	0	0.00K	7.00K
HOOD (ZONE)	HOOD (ZONE)	01/01/2015	00:00	Drought		0	0	0.00K	2.00K
HOOD (ZONE)	HOOD (ZONE)	02/01/2015	00:00	Drought		0	0	0.00K	2.00K
HOOD (ZONE)	HOOD (ZONE)	03/01/2015	00:00	Drought		0	0	0.00K	3.00K
HOOD (ZONE)	HOOD (ZONE)	04/01/2015	00:00	Drought		0	0	0.00K	2.00K
HOOD (ZONE)	HOOD (ZONE)	10/13/2015	00:00	Drought		0	0	1.00K	0.00K
HOOD (ZONE)	HOOD (ZONE)	02/01/2018	00:00	Drought		0	0	0.00K	0.00K
HOOD (ZONE)	HOOD (ZONE)	06/26/2018	00:00	Drought		0	0	0.00K	0.00K
HOOD (ZONE)	HOOD (ZONE)	07/01/2018	00:00	Drought		0	0	0.00K	5.00K
HOOD (ZONE)	HOOD (ZONE)	08/01/2018	00:00	Drought		0	0	0.00K	2.00K
HOOD (ZONE)	HOOD (ZONE)	09/01/2018	00:00	Drought		0	0	0.00K	0.00K
Totals:						0	0	9.00K	85.00K

Source: NOAA National Centers for Environmental Information

During times of drought the value of cattle decreased dramatically due to low cattle weight caused by drought impact on feed lots. Cattle had to be shipped to Oklahoma and farmers had to buy hay to feed cattle instead of growing it themselves. Water levels are a critical concern during this time. The following chart reflects the annual changes in drought conditions.



Source: United States Drought Monitor.

As shown in the Percent Area graph above, the time period from 2014-2016 had the greatest severity and longest time period of D3-D4 drought conditions. Besides major crop damage, these extreme drought conditions have the potential to put Hood County in extreme fire danger and could cause widespread water shortage and restrictions, creating a water emergency.

Flood

Location	County/Zone	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
CRESSON	HOOD CO.	05/31/2016	14:00	Flash Flood		0	0	50.00K	0.00K
GRANBURY	HOOD CO.	06/01/2016	20:45	Flash Flood		0	0	0.00K	0.00K
GRANBURY	HOOD CO.	03/18/2020	03:25	Flash Flood		0	0	0.00K	0.00K
CRESSON	HOOD CO.	05/10/2015	08:00	Flood		0	0	0.00K	0.00K
CRESSON	HOOD CO.	05/31/2016	16:45	Flood		0	0	100.00K	0.00K
CRESSON	HOOD CO.	06/01/2016	00:00	Flood		0	0	0.00K	0.00K
GRANBURY	HOOD CO.	05/13/2015	12:40	Flood		0	0	0.00K	0.00K
LIPAN	HOOD CO.	01/24/2012	22:00	Flood		0	0	1.00K	0.00K
Totals:						0	0	151.00K	0.00K

\Source: NOAA National Centers for Environmental Information

Flooding led to major road closures. The flood reports at the National Weather Service involved roads and vehicles.

Thunderstorm

Location	County/Zone	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
CRESSON	HOOD CO.	05/04/2012	18:56	Hail	1.00 in.	0	0	0.00K	0.00K
CRESSON	HOOD CO.	04/03/2014	16:20	Hail	1.00 in.	0	0	0.00K	0.00K
CRESSON	HOOD CO.	04/24/2015	17:14	Hail	1.00 in.	0	0	0.00K	0.00K
CRESSON	HOOD CO.	10/10/2019	19:40	Hail	1.75 in.	0	0	10.00K	0.00K
GRANBURY	HOOD CO.	03/23/2013	05:57	Hail	0.75 in.	0	0	0.00K	0.00K
GRANBURY	HOOD CO.	05/15/2013	18:52	Hail	1.75 in.	0	0	30.00K	0.00K
GRANBURY	HOOD CO.	05/15/2013	18:56	Hail	2.75 in.	0	0	60.00K	0.00K
GRANBURY	HOOD CO.	04/03/2014	18:15	Hail	1.75 in.	0	0	60.00K	0.00K
GRANBURY	HOOD CO.	05/12/2014	13:40	Hail	0.75 in.	0	0	0.00K	0.00K
GRANBURY	HOOD CO.	04/26/2015	18:49	Hail	1.75 in.	0	0	12.00K	0.00K
GRANBURY	HOOD CO.	12/26/2015	18:40	Hail	0.75 in.	0	0	0.00K	0.00K
GRANBURY	HOOD CO.	04/11/2017	01:10	Hail	1.50 in.	0	0	0.00K	0.00K
GRANBURY	HOOD CO.	10/20/2019	18.39	Hail	1.00 in.	0	0	0.00K	0.00K
LIPAN	HOOD CO.	05/04/2012	18:06	Hail	0.75 in.	0	0	0.00K	0.00K
LIPAN	HOOD CO.	05/04/2012	18:15	Hail	1.75 in.	0	0	7.00K	0.00K
LIPAN	HOOD CO.	03/23/2016	20:45	Hail	1.00 in.	0	0	0.00K	0.00K
TOLAR	HOOD CO.	04/24/2015	17:00	Hail	1.75 in.	0	0	10.00K	0.00K
TOLAR	HOOD CO.	05/09/2015	22:11	Hail	1.75 in.	0	0	0.00K	0.00K
TOLAR	HOOD CO.	05/09/2015	22:12	Hail	1.75 in.	0	0	0.00K	0.00K
GRANBURY	HOOD CO.	05/28/2012	21:12	Thunderstorm Wind	52 kts. EG	0	0	5.00K	0.00K
GRANBURY	HOOD CO.	03/29/2017	00:35	Thunderstorm Wind	56 kts. MG	0	0	0.00K	0.00K
GRANBURY	HOOD CO.	10/10/2020	20:20	Thunderstorm Wind	53 kts. MG	0	0	0.00K	0.00K
GRANBURY	HOOD CO.	5/15/2020	22:02	Thunderstorm Wind	56 kts. MG	0	0	0.00K	0.00K
GRANBURY	HOOD CO.	5/15/2020	22:21	Thunderstorm Wind	50 kts. MG	0	0	3.00K	0.00K
LIPAN	HOOD CO.	05/04/2012	18:06	Thunderstorm Wind	52 kts. EG	0	0	4.00K	0.00K
LIPAN	HOOD CO.	05/26/2016	20:45	Thunderstorm Wind	52 kts. EG	0	0	3.00K	0.00K
LIPAN	HOOD CO.	05/27/2016	02:41	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
TOLAR	HOOD CO.	05/27/2015	16:55	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
Totals:						0	0	310.00K	0.00K

In.: Inch

Kts.: knots

Thunderstorm									
Location	County/Zone	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
EG: Estimated Gusts									

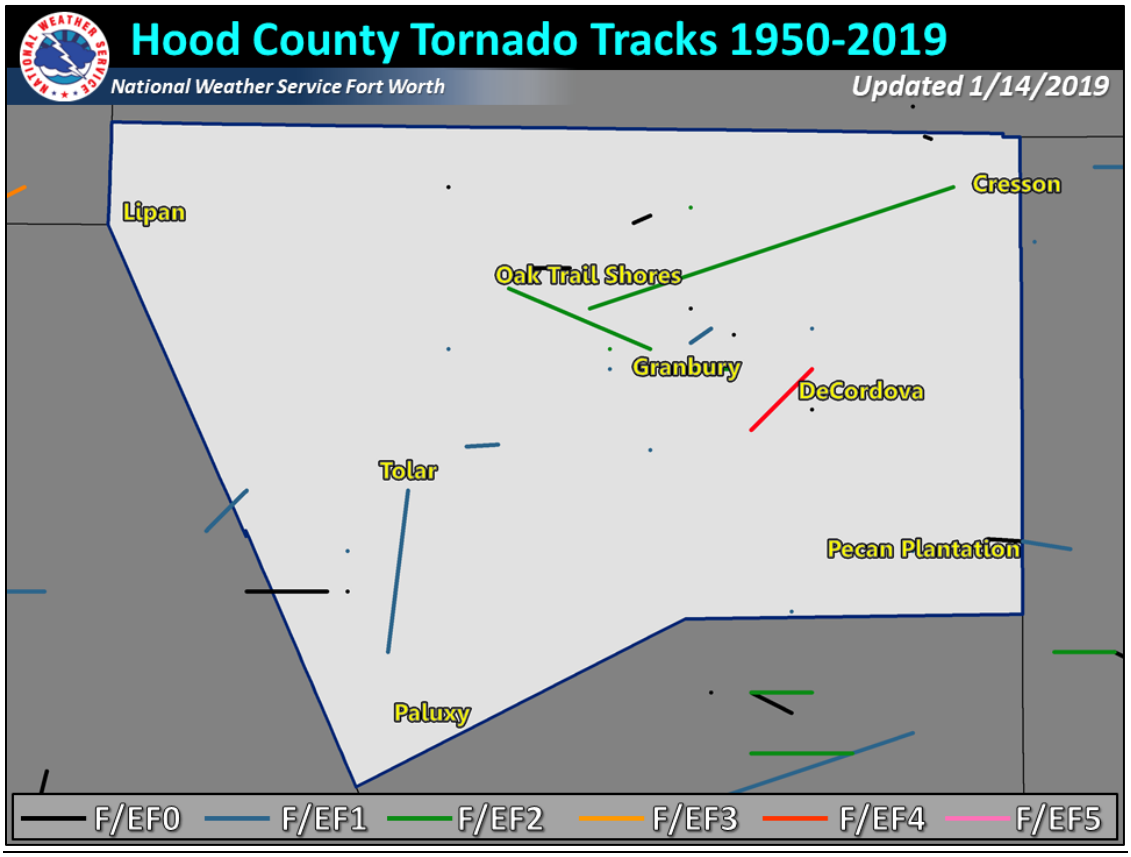
Source: NOAA National Centers for Environmental Information

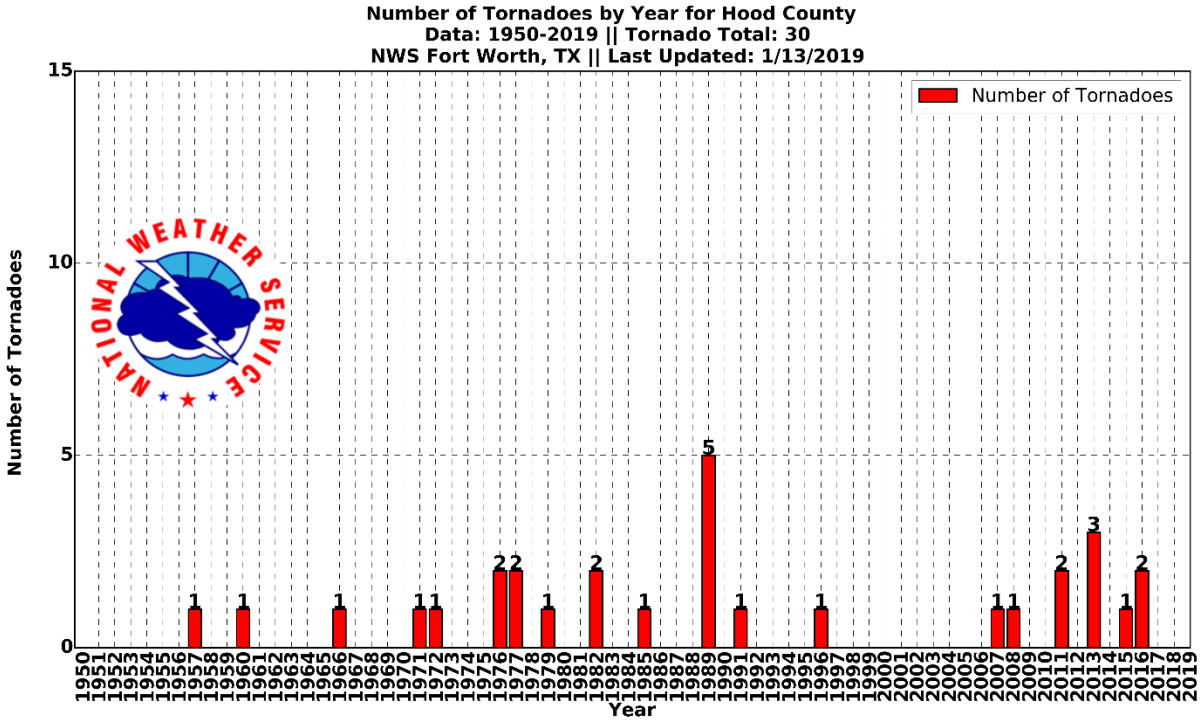
Property was damaged by wind and hail. No lightning events were reported.

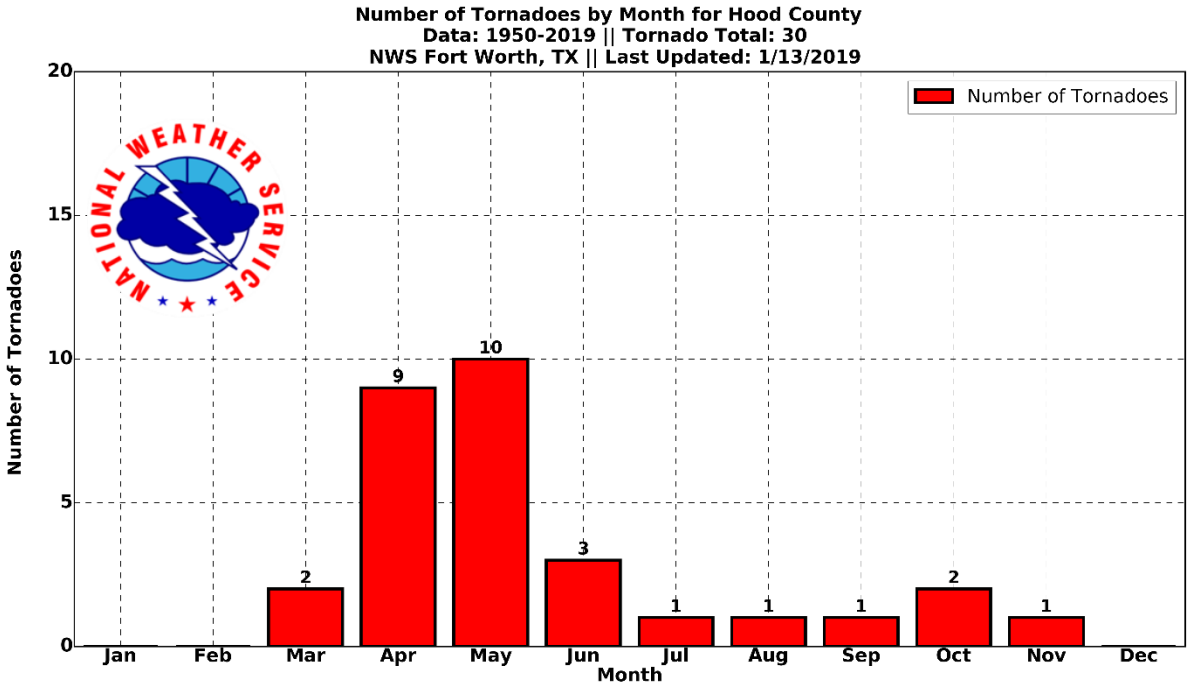
Tornado									
Location	County/Zone	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
TOLAR	HOOD CO.	03/08/2016	07:21	Tornado	EF0	0	0	50.00K	0.00K
GRANBURY	HOOD CO.	03/08/2016	07:36	Tornado	EF0	0	0	4.00K	0.00K
Totals:						0	0	54.00K	0.00K

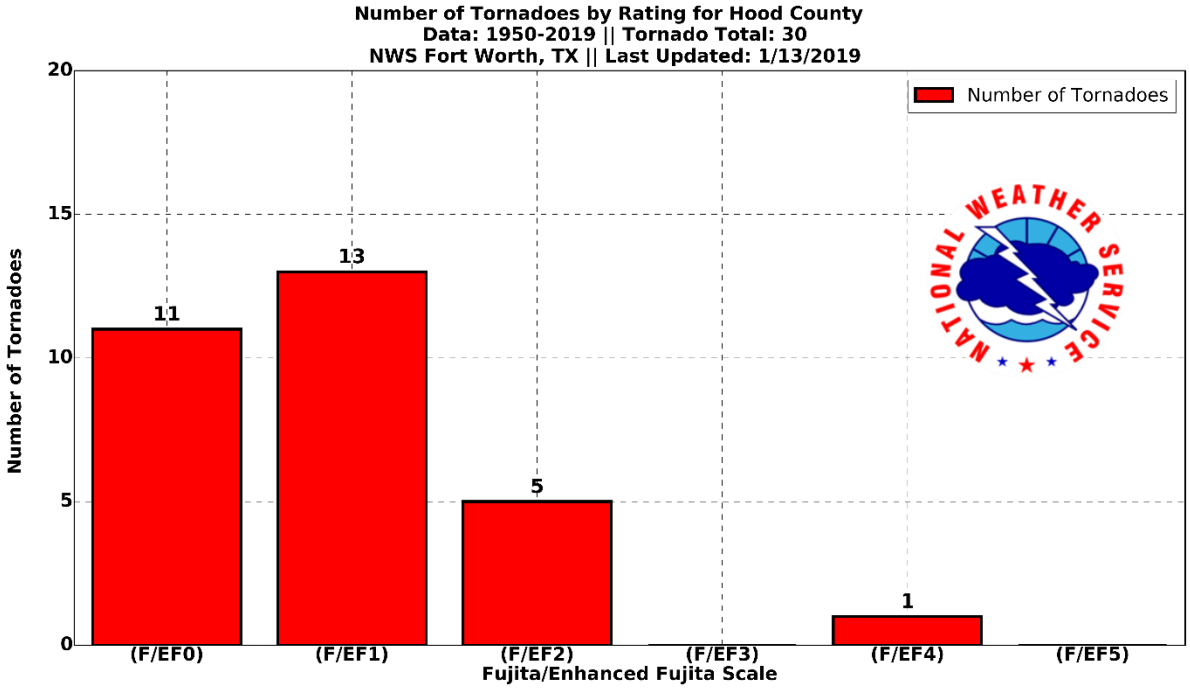
Source: NOAA National Centers for Environmental Information

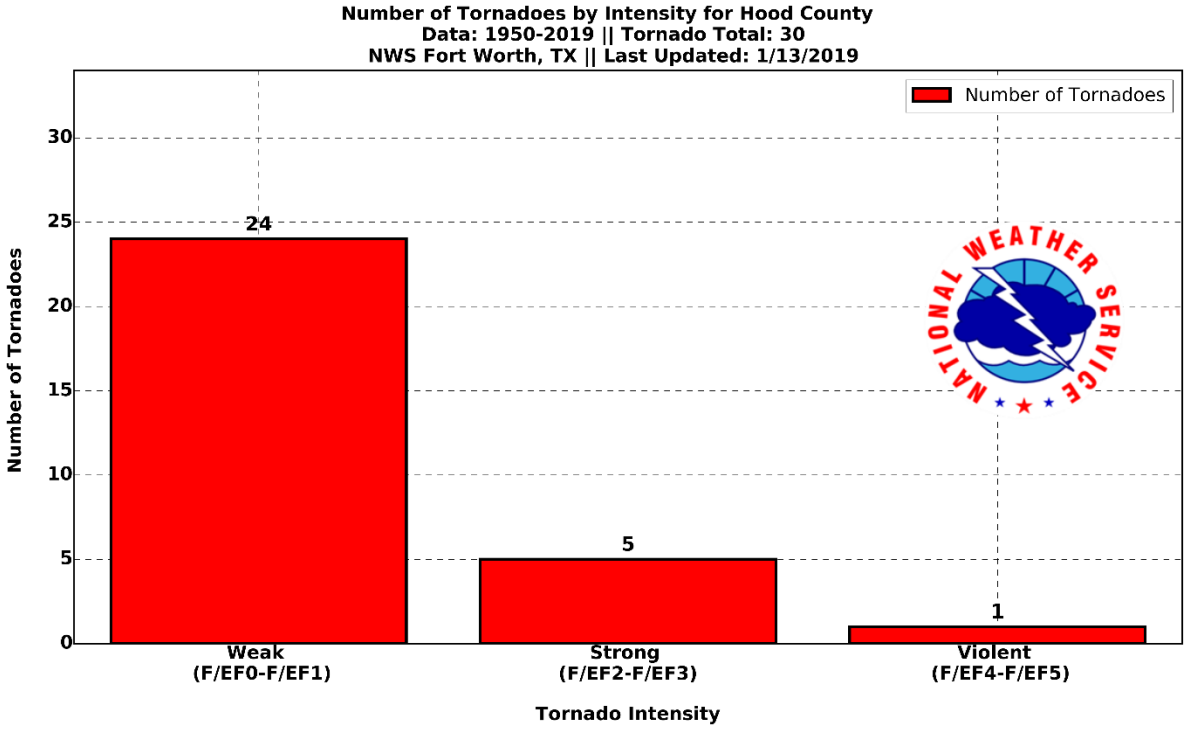
The following map and charts are from the National Weather Service (NWS) Fort Worth Hood County Climatology Page, 1950-2019. They reflect historical data related to tornadoes in Hood County.




Number of Tornadoes by Year for Hood County
Data: 1950-2019 || Tornado Total: 30
NWS Fort Worth, TX || Last Updated: 1/13/2019
Number of Tornadoes
Year


Number of Tornadoes by Month for Hood County
Data: 1950-2019 || Tornado Total: 30
NWS Fort Worth, TX || Last Updated: 1/13/2019
Number of Tornadoes
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Month


Number of Tornadoes by Rating for Hood County
Data: 1950-2019 || Tornado Total: 30
NWS Fort Worth, TX || Last Updated: 1/13/2019
Number of Tornadoes
Number of Tornadoes
20
15
10
5
0
11
13
5
1
(F/EF0)
(F/EF1)
(F/EF2)
(F/EF3)
(F/EF4)
(F/EF5)
Fujita/Enhanced Fujita Scale


Number of Tornadoes by Intensity for Hood County
Data: 1950-2019 || Tornado Total: 30
NWS Fort Worth, TX || Last Updated: 1/13/2019
Number of Tornadoes
Number of Tornadoes
30
25
20
15
10
5
0
24
5
1
Weak
(F/EF0-F/EF1)
Strong
(F/EF2-F/EF3)
Violent
(F/EF4-F/EF5)
Tornado Intensity

Winter Storm									
Location	County/Zone	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
HOOD (ZONE)	HOOD (ZONE)	12/05/2013	17:00	Winter Storm		0	0	200.00K	0.00K
HOOD (ZONE)	HOOD (ZONE)	02/23/2015	04:30	Winter Storm		0	0	6.00K	0.00K
Totals:						0	0	206.00K	0.00K

Source: NOAA National Centers for Environmental Information

During the 2013 storm, up to 1-inch of ice and sleet accumulated in Hood County. Several traffic accidents occurred on the icy streets and numerous tree branches broke due to the weight of the ice. Some of the falling branches damaged buildings and cars. Some power lines also snapped due to the weight of the ice. A 3-vehicle accident on the Two-Mile Bridge over Lake Tawakoni resulted in 3 hospital transports and closed the bridge for some time.

The following article highlights the severe impacts of winter weather in North Central Texas and Hood County. Although this article describes a 2013 storm, it also describes what Hood County could experience again.

National Weather Service: North Texas Snowfall Events

December 5-6, 2013

A winter storm affected much of North and Central Texas for an extended period from December 5th through the 10th. A combination of freezing rain, sleet, and a little snow began falling during the day on the 5th and continued through the morning hours of the 6th. As the ice and sleet settled on the 6th, a thick layer of ice paralyzed most of the area north of a line from Goldthwaite to Cleburne to Ennis to Sulphur Springs. In this area, accumulations of sleet and ice measured up to 5" with the highest amounts from Denton to Sherman to Bonham.

NBC 5 News captured "cobblestone ice" on North Texas roads

Temperatures remained below freezing until the 9th and 10th resulting in a prolonged winter event. Most residents were forced to remain at home for several days. A new term, coined "cobblestone ice," was used to describe the condition of the ice on the interstates and highways due to the compaction of ice and sleet.

South of this area, lighter amounts of icing occurred producing mainly icy bridges, overpasses, and elevated surfaces. As a result of the ice storm, significant tree damage occurred with thousands of tree branches falling under the weight of the ice. Power lines were also brought down, and at the peak of the storm, 275,000 customers were without power in the North Texas region. Most schools, especially in the hardest hit areas, were closed for several days. Some businesses were forced to close

for a day or two also. Hundreds of injuries were reported due to falls on the ice but exact numbers were not available. Seven fatalities occurred during this event; 4 in vehicles, 2 from exposure, and 1 from a fall on the ice. Early estimates from the insurance council estimated $30 million in residential insured loses. The estimate did not include damage to vehicles or roads. Many roads and bridges were damaged from the ice and/or from attempts by Texas Department of Transportation to remove the ice using plows and graders. Hundreds of people and semi-trucks were stranded for long periods on many of the main highways and interstates including I-35 from Fort Worth to the Oklahoma border and Interstate 20 from Fort Worth going west. The clean-up from this event took weeks and even a few months is some places.[15]

Though there has not been a major winter event recorded since this 2013 example, a severe winter storm happening in the next five years cannot be ruled out, as weather patterns have been evolving along with the change in climate, as mentioned earlier.

Not all events have been reported to NWS, as some participants have experienced damage from various hazard events not listed above. Based on the information in the chart above, participating jurisdictions in Hood County can expect a similar occurrence of events and level of damage over the next five years.

Geographic Events

The following data reflects past geographic events that have occurred within the participating jurisdictions. **According to the best information available, there is no history of dam failure in Palo Pinto County and the participating jurisdictions. Expansive soils damage has not been formally documented, though damage has slowly occurred over time.**

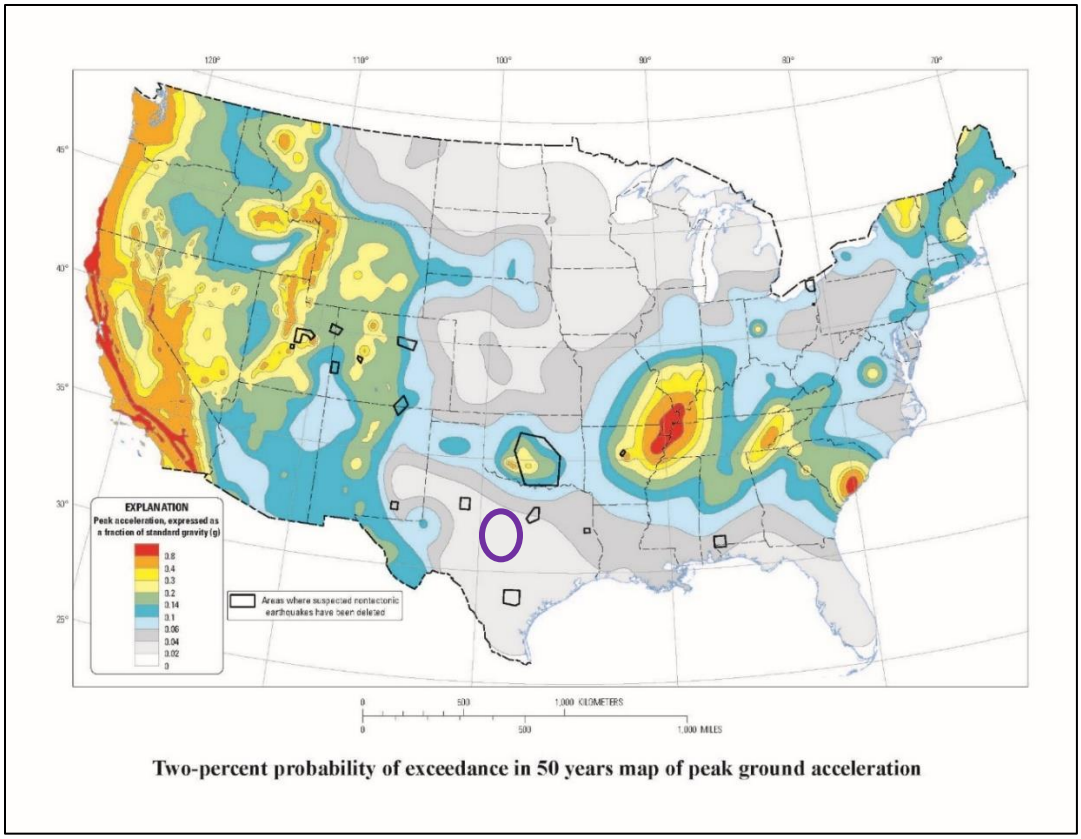
Earthquakes

The number of earthquake events in Hood County varies by source of information. The TexNet Earthquake Catalog website developed and run in 2017 by the University of Texas at Austin's Bureau of Economic Geology provides the most precise near real-time information available about earthquakes across Texas. According to their data, no earthquakes have been reported in Hood County since 2017. Based on this information, the chances of a future earthquake are low.

Along with TexNet, the United States Geological Survey (USGS) confirmed that no earthquakes have occurred in Hood County since 2012.

Hood County has a very low risk to future earthquakes, as shown in the following map.

[15] North Texas Snowfall Events 2013-1879, National Weather Service. <https://www.weather.gov/fwd/snowevents>



Two-percent probability of exceedance in 50 years map of peak ground acceleration

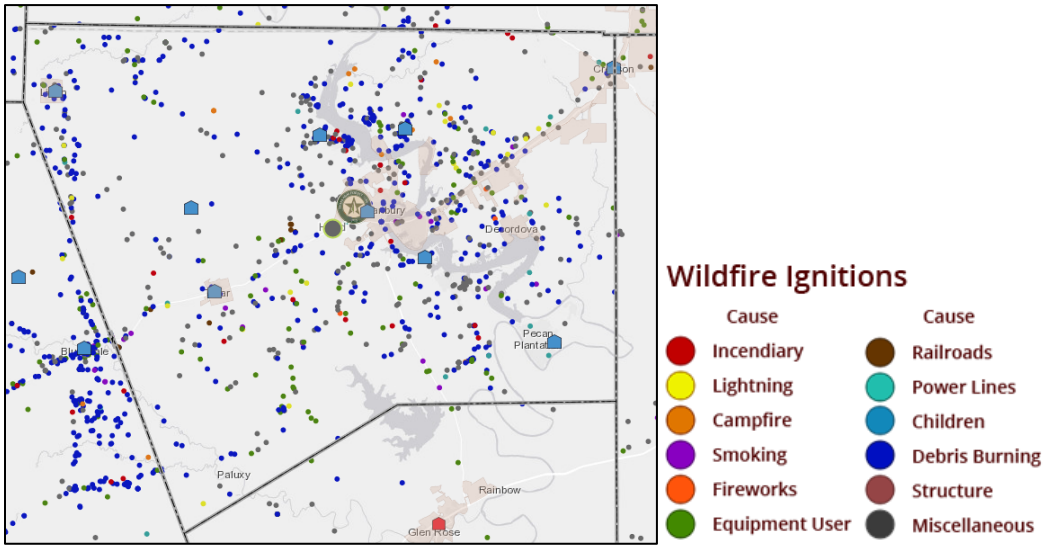
Source: USGS

Wildfires

Below is a list of wildfire damage across Hood County, according to Texas A&M Forest Service records.

Year	County	Agency	Fires	Acres
2012	Hood	TX A&M Forest Service	1	5
2012	Hood	Fire Departments	94	379
2013	Hood	Fire Departments	23	100
2014	Hood	Fire Departments	24	79
2015	Hood	TX A&M Forest Service	1	15
2015	Hood	Fire Departments	27	37
2016	Hood	TX A&M Forest Service	1	18
2016	Hood	Fire Departments	25	80
2017	Hood	TX A&M Forest Service	3	52
2017	Hood	Fire Departments	50	152
2018	Hood	TX A&M Forest Service	3	89
2018	Hood	Fire Departments	72	521
2019	Hood	Fire Departments	4	4

The following Wildfire Ignitions dataset from the Texas A&M Forest Service (TFS) shows the point location of all fires in Hood County from 2005 – 2015. The date range is set by TFS. The fires are symbolized by the cause of the fire. The wildfire occurrence database was obtained from state and local fire department report data sources for the years 2005 to 2015. The local category includes fires reported via Texas A&M Forest Service online fire department reporting system. It is a voluntary reporting system that includes fires reported by both paid and volunteer fire departments since 2005. The compiled fire occurrence database was cleaned to remove duplicate records and to correct inaccurate locations. More detailed maps, per jurisdiction, are located in Appendix A.



Source: Texas A&M Forest Service

3.6 Hazard Summary

Each participating jurisdiction described the location, probability of a future event, and the maximum probable extent of each hazard. The following terms were used to describe the categories:

Location: Location is the geographic area within the planning area that is affected by the hazard, such as a floodplain. The entire planning area may be uniformly affected by some hazards, such as drought or winter storm, while only portions of the planning area may be affected by others, like wildfires. The planning area refers to individual jurisdictions. Planning area refers to the size of the participating jurisdiction providing the description.

- **Negligible**- Less than 10% of planning area would be impacted by a single event.
- **Limited**- 10 to 25% of planning area would be impacted by a single event.
- **Significant**- 26 to 99% of planning area would be impacted by a single event.
- **Extensive**- 100% of planning area would be impacted by a single event.

Probability of Future Events: This information was based on historic events and changing climate.

- **Unlikely**- Less than 1% annual probability.
- **Possible**- Between 1 and 10% annual probability.

- **Likely**- Between 10 and 100% annual probability.
- **Highly Likely**- 100% annual probability.

Level of Possible Damage: Based on historic events and future probability.

- **Minor**- Only minor property damage and minimal disruption of life. Temporary shutdown of critical facilities. Very few injuries, if any.
- **Limited**- More than 10% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one day. Minor injuries possible.
- **Critical**- More than 25% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for more than one week. Multiple deaths/injuries.
- **Catastrophic**- More than 50% of property in affected area damaged/destroyed. Complete shutdown of critical facilities for 30 days or more. High number of deaths/injuries possible.

Maximum Probable Extent: Based on historic events and future probability.

- **Minor**- Minor classification on the scientific scale.
- **Medium**- Medium classification on the scientific scale.
- **Major**- Major classification on the scientific scale.

Extent Scale			
Hazard	**Classification**		
	Minor	**Medium**	**Major**
Drought	PDSI -1.99 to +1.99 D0	PDSI -2.00 to -2.99 D1	PDSI -3.00 to -5.00 D2-D4
Earthquake	Magnitude < 4.9	Magnitude 5.0-6.9	Magnitude > 7.0
Expansive Soils	EI Expansion Potential: 21-50 (Low) EI Expansion Potential: 0-21 (Very Low)	EI Expansion Potential: 51-90 (Medium)	EI Expansion Potential: 91-130 (High) EI Expansion Potential: >130 (Very High)
Extreme Heat	Heat Index 80F°-96F° with 40% humidity	Heat Index 97F°-104F° with 40% humidity	Heat Index >105F° with 40% humidity
Flooding	Within 100yr Flood Zone, Zone AE, A < 10 feet of water	Within 500yr Flood Zone, Zone X 10-25 feet of water	Extending Beyond 100yr and 500yr Flood Zones, Zone A, AE, X > 25 feet of water
Flooding from Dam Failure	< 20% of critical facilities in the inundation zone; Dam Storage capacity less than 10,000 acre-feet	20-50% of critical facilities in the inundation zone; Dam Storage capacity between 10,000 and 100,000 acre- feet	> 50% of critical facilities in the inundation zone; Dam Storage capacity 100,000 acre-feet or more
Thunderstorm	Hail 0”-1.6”	Hail 1.6”-2.4”	Hail 2.4”->4”

Extent Scale			
Hazard	**Classification**		
	Minor	**Medium**	**Major**
	Wind Knots <1-10 LAL: 1-2	Wind Knots 11-27 LAL: 3-4	Wind Knots 28-64+ LAL: 5-6
Tornado	EF0	EF1-EF2	EF3-EF5
Wildfire	KBDI 0-300	KBDI 300-500	KBDI 500-800
Winter Storms	Temperatures 40F° to 35F° Wind Speed <25 MPH Ice Accumulation <.50 inches	Temperatures 30F° to 20F° Wind Speed 25-35 MPH Ice Accumulation .10-1.00 inches	Temperatures 15F° to -45F° Wind Speed >35 MPH Ice Accumulation >.25 inches
Abbreviations:			
PDSI: Palmer Drought (Severity) Index			
EI: Expansion Index test			
LAL: Lightning Activity Level			
EF: Enhanced Fujita scale			
KBDI: Keetch-Byram Drought Index			

Below are the hazard summaries, in alphabetical order, for each participating jurisdiction.

Drought				
Jurisdiction	**Location**	**Probability of Future Events**	**Level of Possible Damage**	**Maximum Probable Extent/Strength**
Cresson	Extensive	Highly Likely	Limited	Medium
Granbury	Extensive	Highly Likely	Limited	Medium
Lipan	Extensive	Highly Likely	Limited	Medium
Tolar	Extensive	Highly Likely	Limited	Medium
Hood County Unincorporated	Extensive	Highly Likely	Limited	Medium

Potential impacts from drought include:

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

- Pipeline damage

Source of groundwater or surface-supply:
Cresson- Private wells **Granbury-** Brazos River, Lake Granbury, and private wells. **Lipan-** Private wells **Tolar-** Private wells **Hood County Unincorporated -** Brazos River, Lake Granbury, and private wells.
Describe the type of water restrictions the jurisdiction enforces, either year-round or during a drought:
Cresson- N/A **Granbury-** N/A **Lipan-** Restrictions are implemented on an as-needed basis. **Tolar-** The City of Tolar has a Drought Plan available to implement as needed. **Hood County Unincorporated -** N/A

Earthquake				
Jurisdiction	**Location**	**Probability of Future Events**	**Level of Possible Damage**	**Maximum Probable Extent/Strength**
Cresson	Extensive	Unlikely	Limited	Minor
Granbury	Extensive	Unlikely	Limited	Minor
Lipan	Extensive	Unlikely	Limited	Minor
Tolar	Extensive	Unlikely	Limited	Minor
Hood County Unincorporated	Extensive	Unlikely	Limited	Minor

Potential impacts from earthquakes include:

- Injury or death
- Property and infrastructure damage
- Water contamination or loss via broken pipes
- Transportation and communication disruption or damage
- Increase in traffic accidents
- Building collapse
- Natural gas leak
- Misplaced residents
- Power outages
- Natural environments damage, to include protected species and critical habitats

Does your jurisdiction require a permit for foundation repairs? Reviewing permits can help a jurisdiction determine the amount of damage in the community.
Cresson- No **Granbury-** No

Lipan- No **Tolar-** Yes **Hood County Unincorporated -** No

Expansive Soils				
Jurisdiction	**Location**	**Probability of Future Events**	**Level of Possible Damage**	**Maximum Probable Extent/Strength**
Cresson	Extensive	Possible	Minor	Minor
Granbury	Extensive	Possible	Minor	Minor
Lipan	Extensive	Possible	Minor	Minor
Tolar	Extensive	Possible	Minor	Minor
Hood County Unincorporated	Extensive	Possible	Minor	Minor

Potential impacts from expansive soils include:

- Property damage due to foundation damage
- Water contamination or loss via broken pipes
- Building and infrastructure damage
- Road damage
- Transportation delays due to road condition
- Damage to utility lines
- Damage to crops and livestock

Extreme Heat				
Jurisdiction	**Location**	**Probability of Future Events**	**Level of Possible Damage**	**Maximum Probable Extent/Strength**
Cresson	Extensive	Highly Likely	Minor	Minor
Granbury	Extensive	Highly Likely	Minor	Minor
Lipan	Extensive	Highly Likely	Minor	Minor
Tolar	Extensive	Highly Likely	Minor	Minor
Hood County Unincorporated	Extensive	Highly Likely	Minor	Minor

Potential impacts from extreme heat include:

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

- Vehicle engine failure
- Damage to crops

What special events or sporting events are held outside during the summer?
Cresson- Motorsport Ranch hosts multiple racing events. **Granbury-** Parades for Memorial Day, 4th of July, and Labor Day. **Lipan-** N/A **Tolar-** Annual bicycle run. **Hood County Unincorporated -** Parades for Memorial Day, 4th of July, and Labor Day.
How many extreme heat exposures have been reported since 2012 at these events?
Cresson- None **Granbury-** None **Lipan-** N/A **Tolar-** 1 **Hood County Unincorporated -** None

Flooding				
Jurisdiction	**Location**	**Probability of Future Events**	**Level of Possible Damage**	**Maximum Probable Extent/Strength**
Cresson	Extensive	Likely	Limited	Minor
Granbury	Extensive	Likely	Limited	Minor
Lipan	Extensive	Likely	Limited	Minor
Tolar	Extensive	Likely	Limited	Minor
Hood County Unincorporated	Extensive	Likely	Limited	Minor

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

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

Common flooding hazards within the planning area include flood hazards from flash flooding, dam failure, and new development. Flooding from dam failure have never occurred nor is it predicted to occur in the next 5 years. Floodwater can disguise many dangerous obstacles, like uncovered manholes or debris that can cause someone to fall over. Standing water, or water that isn't flowing, can also become a breeding ground for insects that can make people very ill. Another risk can be downed power lines which may still be live.

Describe future development that may be at risk to flooding based on current zoning maps.
Cresson- N/A **Granbury-** N/A **Lipan-** N/A **Tolar-** N/A **Hood County Unincorporated -** N/A
What rivers, creeks, and/or lakes are in your jurisdiction?
Cresson- Fall Creek and small ponds **Granbury-** Lake Granbury, Paluxy River, Brazos River, and several tributaries **Lipan-** Small ponds **Tolar-** Small ponds **Hood County Unincorporated -** Lake Granbury, Paluxy River, Brazos River, and several tributaries
Which of these water sources have a history of flooding?
Cresson- None **Granbury-** Lake Granbury, Paluxy River, Brazos River, and several tributaries **Lipan-** None **Tolar-** None **Hood County Unincorporated -** Lake Granbury, Paluxy River, Brazos River, and several tributaries
Name any streets or intersections that experience flooding or flash flooding:
Cresson- Clearview Court and SH 171 **Granbury-** There is localized flooding along Pearl and Morgan, as well as Paluxy and Morgan, due to drainage issues. The Park Street low water crossing flows into the City Park Natural Creek. **Lipan-** Residential roads **Tolar-** Flash flooding may occur on most streets with 8th Street, Tolar Cemetery Road, and 7th Street being the highest concern. **Hood County Unincorporated -** US Hwy 377
What critical facilities or infrastructure (airports, dams, water treatment facilities, wastewater treatment facilities, schools, hospitals, fire stations, and police stations) are located in the 100-year floodplain?
Cresson- N/A **Granbury-** N/A **Lipan-** N/A **Tolar-** N/A **Hood County Unincorporated -** N/A

In the event of a wildfire, will flooding and erosion be an issue in restoring destroyed forested slopes?
Cresson- N/A **Granbury-** N/A **Lipan-** N/A **Tolar-** N/A **Hood County-** N/A

Flooding from Dam Failure				
Jurisdiction	**Location**	**Probability of Future Events**	**Level of Possible Damage**	**Maximum Probable Extent/Strength**
Cresson	N/A	N/A	N/A	N/A
Granbury	Negligible	Unlikely	Minor	Minor
Lipan	N/A	N/A	N/A	N/A
Tolar	N/A	N/A	N/A	N/A
Hood County Unincorporated	Negligible	Unlikely	Minor	Minor

Potential impacts from dam failure include:

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

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

Although dam failures have the potential to cause extensive damage, there has been no recorded failures in Hood County, as a wide array of measures, including maintenance, are taken to ensure structural integrity. The United States Corps of Engineers (USACE) and the Texas Commission on Environmental Quality (TCEQ) have conducted extensive dam failure training for jurisdictional staff, reducing the impact of flooding from a dam failure to the jurisdictions. Jurisdictions have also worked with the private owners to ensure maintenance is enforced and regulated.

What dams are in your jurisdiction and what would be negatively affected if they failed (both within and outside your jurisdiction)?
Cresson- N/A **Granbury-** Comanche Harbor Lake Dam. The Morris Sheppard Dam (Palo Pinto County) failure would lead to flooding throughout the whole Brazos River/Lake Granbury Area. **Lipan-** N/A **Tolar-** N/A

Hood County Unincorporated – De Cordova Dam and Comanche Harbor Lake Dam. The Morris Sheppard Dam (Palo Pinto County) failure would lead to flooding throughout the whole Brazos River/Lake Granbury Area.

The hazard classification of dams is not available to the public, per Homeland Security regulations. If specific information is needed, please contact the dam owner or the Dam Safety Section of the TCEQ**.**

According to USACE, there are 26 total dams within Hood County: 31% of the dams are regulated by a state agency and 0% are regulated by a federal agency. The average age of the dams is 52 years old.

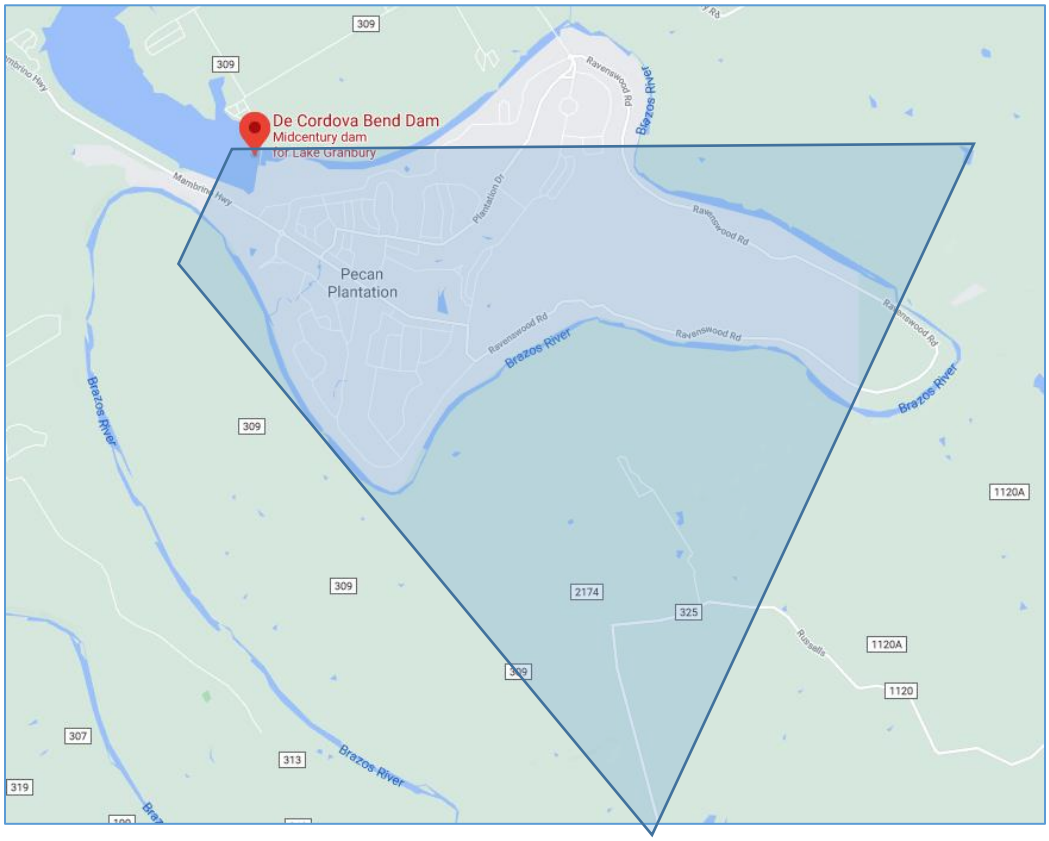
The following chart identifies the recorded discharge of the dams that were identified by the participants as a potential threat to their communities. Despite other dams being in the area, their failures would have no severe impact on people or property.

DAM_NAME	DAM_ LENGTH	DAM_ HEIGHT	MAX_ DISCHARGE	MAX_ STORAGE	DRAINAGE_ AREA
DE CORDOVA BEND DAM	2200	79	635000	240640	1350
COMANCHE HARBOR LAKE DAM	460	37	1	74	2
MORRIS SHEPPARD DAM	2740	187	507762	1365000	17700

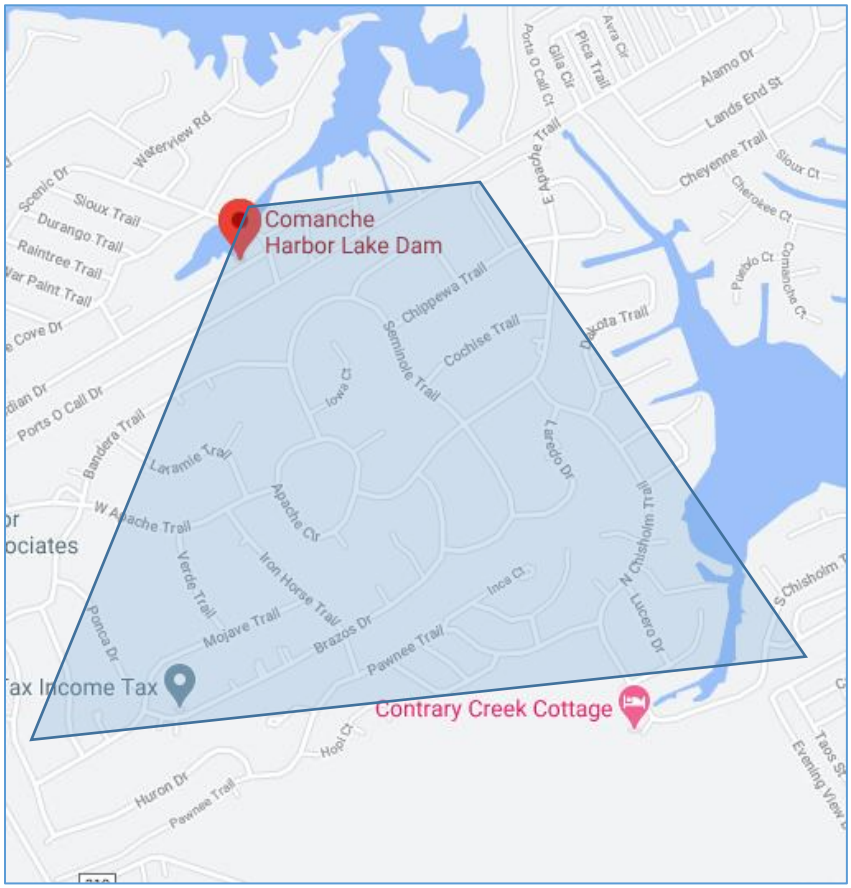
For dams with a maximum storage capacity of 100,000 acre-feet or more, all census blocks within five miles were considered to be at risk to potential dam failure hazards. For dams with a maximum storage capacity between 10,000 and 100,000 acre-feet, all census blocks within three miles were considered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

The following map shows the **estimated** inundation zones for the two (2) dams the jurisdictions identified as the most impactful to their communities. The third dam, Morris Sheppard in Palo Pinto County, would increase the water level throughout the Brazos River in Hood County- so any development along the river is vulnerable to dam failure flooding.

De Cordova Bend Dam



Comanche Harbor Lake Dam



It is each dam owner's responsibility to ensure that their dam is in compliance with the Texas Commission on Environmental Quality's [16](TCEQ) regulations regarding emergency action plans. Additionally, each dam owner required to have an emergency action plan must know and be prepared to take the actions outlined in their emergency action plan, should their dam begin to fail.

Local emergency management is only responsible for the impact of flooding from dam failure on surrounding areas. The responsibility for maintaining a safe dam rests with its owner. Dam owners are also responsible for maintaining safety *at* and *around* their dam. Dam owners are the only ones who can directly maintain the dams and implement mitigation and safety measures on the structures.[17]

Responsible Parties	Dam Related Safety Activities
Dam Owners/Operators	• Identification of emergency at dam • Initial notifications • Implementation of repairs • Security and technical assistance on site

[16] https://www.tceq.texas.gov/compliance/investigation/damsafetyprog.html For the most up-to-date information, contact TCEQ directly.

[17] https://damsafety-prod.s3.amazonaws.com/s3fs-public/files/All%20-%20Dam%20Owner%20Fact%20Sheets%202019.pdf Dam Ownership Fact Sheet. 2018.

Responsible Parties	Dam Related Safety Activities
Local Emergency Management and Local Responders	• Public warning • Possible evacuation • Shelter plan activated • Rescue and recovery • State of Emergency declaration • Termination of emergency status
State Emergency Management	• Aid affected area when requested • Coordinate specialized assistance • Notify appropriate state agencies • Determine who does what in an emergency

Thunderstorm				
Jurisdiction	**Location**	**Probability of Future Events**	**Level of Possible Damage**	**Maximum Probable Extent/Strength**
Cresson	Extensive	Highly Likely	Limited	Medium
Granbury	Extensive	Highly Likely	Limited	Medium
Lipan	Extensive	Highly Likely	Limited	Medium
Tolar	Extensive	Highly Likely	Limited	Medium
Hood County Unincorporated	Extensive	Highly Likely	Limited	Medium

Potential impacts from thunderstorms include:

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

Although most new homes and buildings in the participating jurisdictions are built to resist the effects of all but the strongest thunderstorms, several mobile and manufactured home parks and vehicles remain vulnerable. Thousands of homes and vehicles can be damaged by high winds, hail, and lightning in a single storm, causing millions of dollars in damages.[18]

[18] State of Texas Mitigation Plan. 2013, page 72.

Tornado				
Jurisdiction	**Location**	**Probability of Future Events**	**Level of Possible Damage**	**Maximum Probable Extent/Strength**
Cresson	Extensive	Likely	Catastrophic	Medium
Granbury	Extensive	Likely	Catastrophic	Medium
Lipan	Extensive	Likely	Catastrophic	Medium
Tolar	Extensive	Likely	Catastrophic	Medium
Hood County Unincorporated	Extensive	Likely	Catastrophic	Medium

Potential impacts from tornadoes include:

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

Are there any community safe rooms in your jurisdiction?
Cresson- No
Granbury- No
Lipan- No
Tolar- No
Hood County Unincorporated - No

Wildfire				
Jurisdiction	**Location**	**Probability of Future Events**	**Level of Possible Damage**	**Maximum Probable Extent/Strength**
Cresson	Extensive	Likely	Limited	Medium
Granbury	Extensive	Likely	Limited	Medium
Lipan	Extensive	Likely	Limited	Medium
Tolar	Extensive	Likely	Limited	Medium
Hood County Unincorporated	Extensive	Likely	Limited	Medium

Potential impacts from wildfires include:

- Injury or death

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

Considering population, economy, existing and future structures, improved property, critical facilities, critical infrastructure, and protected species, what is specifically vulnerable to wildfires in your jurisdiction?
Cresson- There is almost always a loss of feed crops for livestock along with the potential loss of structures and outbuildings. **Granbury-** There is almost always a loss of feed crops for livestock along with the potential loss of structures and outbuildings. **Lipan-** There is almost always a loss of feed crops for livestock along with the potential loss of structures and outbuildings. **Tolar-** There is almost always a loss of feed crops for livestock along with the potential loss of structures and outbuildings. **Hood County Unincorporated -** There is almost always a loss of feed crops for livestock along with the potential loss of structures and outbuildings.
Where are sources of open space, greater than 25 acres, in your jurisdiction?
Cresson- There is open land surrounding and throughout the city. **Granbury-** There is open land surrounding and throughout the city. **Lipan-** There is open land surrounding and throughout the city. **Tolar-** There is open land surrounding and throughout the city. **Hood County Unincorporated -** There is open land surrounding and throughout the county.
Does your jurisdiction participate in prescribed burns? *A controlled or prescribed burn, also known as hazard reduction burning, backfire, swailing, or a burn-off, is a wildfire set intentionally for purposes of forest management, farming, prairie restoration or greenhouse gas abatement.*
Cresson- No **Granbury-** No **Lipan-** No **Tolar-** No **Hood County Unincorporated -** No

Winter Storm				
Jurisdiction	**Location**	**Probability of Future Events**	**Level of Possible Damage**	**Maximum Probable Extent/Strength**
Cresson	Extensive	Likely	Limited	Medium
Granbury	Extensive	Likely	Limited	Medium
Lipan	Extensive	Likely	Limited	Medium
Tolar	Extensive	Likely	Limited	Medium
Hood County Unincorporated	Extensive	Likely	Limited	Medium

Potential impacts from winter storms include:

- Structure and infrastructure damage
- Injury or death
- Power outages
- Loss of ability to use roads for driving
- Increased traffic accidents
- Loss of heat
- Stranded travelers / motels at full capacity
- Tree debris create fuel load for fire hazard
- Delayed emergency response time
- Frozen/ busted pipes leading to loss of water
- Disruption of traffic
- Impacts to the economy
- Communication capabilities decrease

3.7 Hazard Ranking

Due to the frequency of occurrence and high impact of hazards during this planning period, the ranking order of these hazards has changed since the 2015 plan. After assessing the vulnerabilities, capabilities, and risks, the participating jurisdictions considered the possible effects on population, economy, existing and future structures, improved property, critical facilities and infrastructure, and the natural environment when ranking each hazard.

The following table reflects the rankings of each hazard, per jurisdiction.

Jurisdiction	Drought	Earthquake	Expansive Soils	Extreme Heat	Flooding	Dam Failure Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms
Cresson	1	9	8	2	6	N/A	3	7	4	5
Granbury	1	9	8	2	6	10	3	7	4	5

Jurisdiction	Drought	Earthquake	Expansive Soils	Extreme Heat	Flooding	Dam Failure Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms
Lipan	1	9	8	2	6	N/A	3	7	4	5
Tolar	1	9	8	2	6	N/A	3	7	4	5
Hood County Unincorporated	1	9	8	2	6	10	3	7	4	5

Only Granbury and Hood County Unincorporated would be negatively impacted by flooding from dam failure due to the nature of the dams in their area.

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Chapter 4: Mitigation Strategy

Requirement	
§201.6(c)(3)	[The plan shall include the following:] A mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs, and resources, and its ability to expand on and improve these existing tools.
§201.6(c)(3)(i)	[The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.
§201.6(c)(3)(iii)	[The hazard mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. All plans approved by FEMA [Federal Emergency Management Agency] after October 1, 2008, must also address the jurisdiction's participation in the NFIP [National Flood Insurance Program], and continued compliance with NFIP requirements, as appropriate.
§201.6(c)(3)(iv)	[The hazard mitigation strategy shall include an] action plan, describing how the action identified in paragraph (c)(3)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.
§201.6(c)(4)(ii)	For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan. [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvements, when appropriate.

4.1 Mitigation Goals

The Hood County Hazard Mitigation Planning Team reviewed the previous Hood County mitigation goals and unanimously agreed to forego these goals and adopt the following hazard mitigation goals:

"Our goals are to protect life and reduce bodily harm from natural hazards, and to lessen the impacts of natural hazards on property and the community through hazard mitigation."

4.2 Mitigation Strategy

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

Each participating jurisdiction recommended strategies and actions that would support the mitigation goals, then went through a ranking process to determine which actions they would prioritize for completion. The jurisdictions conducted a cost benefit analysis to determine which strategies would most benefit their community. All project cost estimations are based on agency expertise by those submitting mitigation actions as well as previous project costs; however, many projects provided have not yet undergone the official benefit-cost analysis provided by FEMA. In these cases, jurisdictions derived the benefit cost per project based on a study conducted by the National Institute of Building Science. This study estimates that past 23 years of federally funded natural hazard mitigation has prevented approximately one million nonfatal injuries, 600 deaths, and 4,000 cases of post-traumatic stress disorder (PTSD), a total cost savings of $68 billion. The key findings of the report included that $1 spent on mitigation saves society an average of $6, with positive benefit-cost ratios for all hazard types studied.[19] Therefore, to reflect the benefits of future projects, each estimated project was multiplied by 6 to represent the benefit of each mitigation strategy. Utilizing this information, in addition to their jurisdiction's priorities, jurisdictions ranked their mitigation strategies and submitted them to the HMPT.

4.3 Funding Priorities

As necessary, participating jurisdictions will seek outside funding sources to implement mitigation projects in both the pre-disaster and post-disaster environments. When applicable, potential funding sources have been identified for proposed actions listed in the mitigation strategies.

Priority will go towards projects will the highest positive impact on community resilience.

4.4 Status of Previous Mitigation Action Items

The action items in the 2015 Hood County HazMAP were determined by the 2015 Local Planning Team (LPT) in each jurisdiction. Below are the action items from each participating jurisdiction from the 2015 plan and the status of each action. Actions that were 'deleted' were no longer a priority to the jurisdiction. Actions 'deferred' have been deferred to this mitigation plan.

The cities of Lipan and Tolar are new participants; thus, they do not have previous action to identify.

City of Cresson	
Status	**2015 Mitigation Actions**
Deleted	Implement a comprehensive public education campaign.
Deleted	Purchase and install outdoor early warning system.
Completed	Implement the Texas Individual Tornado Safe Room Rebate Program.

[19] Multihazard Mitigation Council (2017) Natural Hazard Mitigation Saves 2017 Interim Report: An Independent Study. Principal Investigator Porter, K.; Co-Principal Investigators Scawthorn, C.; Dash, N.; Santos, J.; Investigators: Eguchi, M., Ghosh., S., Huyck, C., Isteita, M., Mickey, K., Rashed, T.; P. Schneider, Director, MMC. National Institute of Building Sciences, Washington.

City of Cresson	
Status	**2015 Mitigation Actions**
Deleted	Develop Community Wildfire Protection Plan (CWPP) and implement fuels reduction programs.
Deleted	Issue and promote public information/education releases to remind citizens to be aware of potential loss of life to wildfires and the impact that early warning/recognition will bring them.
Deleted	Adopt debris management and flood abatement ordinances to prevent buildup of debris and materials that could cause flooding.
In Progress	Develop and adopt water conservation codes and ordinances for times of drought.
Deleted	Assess and prioritize public and commercial buildings that may be particularly vulnerable to earthquake damage.
Deleted	Hire consultant to complete inundation studies of earthen dam in Tres Vistas.
Deleted	Identify, equip and open heating and cooling centers across Cresson to prevent special populations from temperature injury.
Deleted	Raise the road level of Bluebonnet Drive.
Deleted	Develop an emergency plan for drought.

City of Granbury	
Status	**2015 Mitigation Actions**
Deferred	Implement a comprehensive public education campaign.
Deferred	Implement program for inspecting and removing tree-limbs that are near power lines.
Deferred	Purchase and install CASA WX Radar.
Deferred	Create and implement new building standards designed to mitigate against earthquake damage.
Deferred	Expand the Outdoor Warning System to cover new populations.
Deferred	Install hail resistant awnings in parking lots of government buildings to protect public service vehicles from storm damage.
Deferred	Purchase and distribute All-Hazard NOAA Weather Radios to citizens of Granbury.
Deferred	Increase public awareness of the Code Red emergency notification system.
Deferred	Identify and equip heating and cooling centers across Granbury to prevent special populations from temperature-related injury.
Deferred	Develop and implement water restriction ordinances to use in periods of drought.
Deferred	Create and implement new building codes designed to mitigate against earthquake damage.
Deferred	Implement a fuel reduction program.
Deferred	Conduct a study to identify new low water crossings.
Deferred	Based on study, improve roadside drainage ditches to increase water flow during flood events.
Deferred	Conduct inundation studies on the dams in Granbury.
Completed	Implement Individual Safe Room Rebate Program.
Deferred	Develop an emergency plan for drought.

Hood County Unincorporated	
Status	**2015 Mitigation Actions**
In Progress	Implement a comprehensive public education campaign.
Deleted	Purchase and install CASA WX Radar
Deleted	Assess and prioritize public and commercial buildings that may be particularly vulnerable to earthquake damage.
In Progress	Expand the Outdoor Warning System
Deleted	Install hail resistant awnings in parking lots of government buildings to protect public service vehicles from storm damage.
Deleted	Purchase and distribute All-Hazard NOAA Weather Radios to citizens of Hood County.
Completed	Increase public awareness of mitigation programs in Hood County.
Completed	Identify, equip and open heating and cooling centers across Hood County to prevent special populations from temperature injury
In Progress	Develop water conservation guidelines to use in periods of drought.
Deleted	Implement a fuel reduction program
Completed	Implement the Texas Individual Tornado Safe Room Rebate Program
Completed	Conduct a study to identify new low water crossings
In Progress	Based on study, improve roadside drainage ditches to increase water flow during flood events.
In Progress	Conduct inundation studies on the dams in Hood County
Deleted	Develop an emergency plan for drought.

4.5 New Mitigation Action Items

New action items were determined by each participating jurisdiction's Local Planning Team for this Hazard Mitigation Action Plan (HazMAP). These actions include mitigation actions that qualify for mitigation funding as well as enforcement, maintenance, and response actions that the jurisdictions have identified as opportunities to increase their resiliency to hazards.

During the capabilities assessment and hazard analysis, previously impacted assets and populations were analyzed to determine the highest probability of damage and potential of loss of life per hazard. To determine the estimated benefit of each action item, data from the 2017 Interim Report was used to develop a cost-benefit analysis [*Estimated Cost x 6 = Estimated Benefit*], as it reports that $1 spent in mitigation saves a community an average of $6 in recovery[20].

Remaining consistent with previous plans, **priority** will go towards projects with the highest positive impact on community resilience, including life safety and property protection. Below are the action items for this HazMAP.

[20] Natural Hazard Mitigation Saves: 2017 Interim Report. National Institute of Building Science. < https://www.nibs.org/page/mitigationsaves>

City of Cresson Mitigation Action Items

Hazard(s) Addressed	**Earthquakes, Extreme Heat, Flooding, Thunderstorms, Wildfires, Winter Storms, Tornadoes**
Action: Purchase and implement a mass notification system to alert residents of hazards.	
Participating Jurisdiction	City of Cresson
Priority:	1
Estimated Cost:	$2,000
Estimated Benefit:	$12,000
Potential Funding Source(s):	Mitigation Grant, General Fund
Lead Agency/Department Responsible:	City Administration
Implementation Schedule:	6 months
Hazard(s) Addressed	**Flooding**
Action: Increase the capacity of the storm drainage system by installing larger culverts and adding drainage points along vulnerable or critical roads.	
Participating Jurisdiction	City of Cresson
Priority:	2
Estimated Cost:	$300,000
Estimated Benefit:	$1.8 million
Potential Funding Source(s):	Mitigation Grant, CDBG, General Fund
Lead Agency/Department Responsible:	City Administration
Implementation Schedule:	24 months
Hazard(s) Addressed	**Flooding**
Action: Purchase barriers to close roads during flooding.	
Participating Jurisdiction	City of Cresson
Priority:	3
Estimated Cost:	$15,000
Estimated Benefit:	$90,000
Potential Funding Source(s):	Mitigation Grant, General Fund
Lead Agency/Department Responsible:	City Administration
Implementation Schedule:	12 months

Hazard(s) Addressed	Earthquakes, Expansive Soils, Extreme Heat, Flooding, Thunderstorms, Wildfires, Winter Storms
Action: Purchase and install emergency generators in critical facilities to include, but not limited to, City Hall, hospitals, and Emergency Operations Center.	
Participating Jurisdiction	City of Cresson
Priority:	4
Estimated Cost:	$300,000
Estimated Benefit:	$1.8 million
Potential Funding Source(s):	Mitigation grant, CDBG, General Fund
Lead Agency/Department Responsible:	City Administration
Implementation Schedule:	24 Months
Hazard(s) Addressed	**Wildfire**
Action: Purchase vulnerable properties and clean it up to reduce the fire hazard.	
Participating Jurisdiction	City of Cresson
Priority:	5
Estimated Cost:	$70,000
Estimated Benefit:	$420,000
Potential Funding Source(s):	Mitigation Grant, General Fund
Lead Agency/Department Responsible:	City Administration
Implementation Schedule:	24 months
Hazard(s) Addressed	**Wildfire**
Action: Issue and promote public information/education releases to remind citizens to be aware of potential loss of life to wildfires and the impact that early warning/recognition will bring them.	
Participating Jurisdiction	City of Cresson
Priority:	6
Estimated Cost:	$30,000
Estimated Benefit:	$180,000
Potential Funding Source(s):	Mitigation Grant, General Fund
Lead Agency/Department Responsible:	City Administration, Fire Chief
Implementation Schedule:	12 months

Hazard(s) Addressed	Flooding
Action: Review participation in NFIP and improve where necessary.	
Participating Jurisdiction	City of Cresson
Priority:	7
Estimated Cost:	$15,000
Estimated Benefit:	$90,000
Potential Funding Source(s):	Mitigation Grant, General Fund
Lead Agency/Department Responsible:	City Administration
Implementation Schedule:	12 months
Hazard(s) Addressed	**Drought, Earthquakes, Expansive Soils, Extreme Heat, Flooding, Dam Failure Flooding, Thunderstorms, Tornadoes, Wildfires, Winter Storms**
Action: Adopt/rewrite/enforce most current building codes.	
Participating Jurisdiction	City of Cresson
Priority:	8
Estimated Cost:	$5,000
Estimated Benefit:	$30,000
Potential Funding Source(s):	Hazard Mitigation Grant, Capital Improvement
Lead Agency/Department Responsible:	Code Enforcement
Implementation Schedule:	12 months
Hazard(s) Addressed	**Drought, Expansive Soils, Extreme Heat, Flooding**
Action: Use Smartscape in existing and new developments landscapes	
Participating Jurisdiction	City of Cresson
Priority:	9
Estimated Cost:	$100,000
Estimated Benefit:	$600,000
Potential Funding Source(s):	County Budget, Grants, Property Owners
Lead Agency/Department Responsible:	Public Works Department
Implementation Schedule:	24 months

Hazard(s) Addressed	Drought, Earthquakes, Expansive Soils, Heat, Flooding, Thunderstorms, Tornado, Wildfires, Winter Storms
Action: Implement public education program to address the risks and mitigation actions (that public can do at their homes/properties) for the identified hazards using social media, city website, local newspaper, and public outreach.	
Participating Jurisdiction	City of Cresson
Priority:	10
Estimated Cost:	$25,000
Estimated Benefit:	$100,000
Potential Funding Source(s):	General Funds, State and/or Federal Grant Funding
Lead Agency/Department Responsible:	City Administration
Implementation Schedule:	24 months

City of Granbury Mitigation Action Items

Hazard(s) Addressed	Flooding, Dam Failure Flooding
Action: Limit construction in floodplains.	
Participating Jurisdiction	City of Granbury
Priority:	1
Estimated Cost:	$0
Estimated Benefit:	$0
Potential Funding Source(s):	Not applicable
Lead Agency/Department Responsible:	Engineering
Implementation Schedule:	6 months
Hazard(s) Addressed	**Drought**
Action: Create a monitoring strategy for water supply and implement a water conservation plan.	
Participating Jurisdiction	City of Granbury
Priority:	2
Estimated Cost:	$0
Estimated Benefit:	$0
Potential Funding Source(s):	N/A
Lead Agency/Department Responsible:	City Water Department
Implementation Schedule:	12 months

Hazard(s) Addressed	Earthquakes, Expansive Soils, Extreme Heat, Flooding, Dam Failure Flooding, Thunderstorms, Tornadoes, Wildfires, Winter Storms
Action: Purchase and install backup generators for all critical facilities and infrastructure.	
Participating Jurisdiction	City of Granbury
Priority:	3
Estimated Cost:	$500,000
Estimated Benefit:	$3 million
Potential Funding Source(s):	Hazard Mitigation grants, CDBG, Capital Improvement
Lead Agency/Department Responsible:	Facility Maintenance
Implementation Schedule:	24 months
Hazard(s) Addressed	**Flooding**
Action: Become an NFIP CRS Community.	
Participating Jurisdiction	City of Granbury
Priority:	4
Estimated Cost:	$0
Estimated Benefit:	$0
Potential Funding Source(s):	Not applicable
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	6 months
Hazard(s) Addressed	**Drought, Earthquakes, Expansive Soils, Extreme Heat, Flooding, Dam Failure Flooding, Thunderstorms, Tornadoes, Wildfires, Winter Storms**
Action: Adopt/rewrite/enforce most current building codes.	
Participating Jurisdiction	City of Granbury
Priority:	5
Estimated Cost:	$5000
Estimated Benefit:	$30,000
Potential Funding Source(s):	Hazard Mitigation Grant, Capital Improvement
Lead Agency/Department Responsible:	Code Enforcement
Implementation Schedule:	12 months

Hazard(s) Addressed	Thunderstorms, Tornadoes, Wildfires, Winter Storms
Action: Establish standards for pruning trees around power lines.	
Participating Jurisdiction	City of Granbury
Priority:	6
Estimated Cost:	$0
Estimated Benefit:	$0
Potential Funding Source(s):	Hazard Mitigation Grant, Capital Improvement
Lead Agency/Department Responsible:	City Electric
Implementation Schedule:	12 months

City of Lipan Mitigation Action Items

Hazard(s) Addressed	Drought, Earthquake, Expansive Soils, Extreme Heat, Flooding, Thunderstorms, Tornadoes, Wildfires, Winter Storms
Action: Create a city website to enhance the current public education program to address the risks and mitigation actions for the identified hazards and public outreach.	
Participating Jurisdiction	City of Lipan
Priority:	1
Estimated Cost:	$5,000
Estimated Benefit:	$30,000
Potential Funding Source(s):	City Budget, Grants
Lead Agency/Department Responsible:	City Administration
Implementation Schedule:	24 months
Hazard(s) Addressed	**Tornadoes, Thunderstorms**
Action: Establish a community saferoom in the gymnasium.	
Participating Jurisdiction	City of Lipan
Priority:	2
Estimated Cost:	$100,000
Estimated Benefit:	$600,000
Potential Funding Source(s):	Local Funds, State/Federal Funds
Lead Agency/Department Responsible:	City Administration, Lipan ISD
Implementation Schedule:	24 months

Hazard(s) Addressed	Thunderstorms, Tornadoes, Wildfires, Winter Storms
Action: Implement a program for inspection and removal of tree limbs near power lines.	
Participating Jurisdiction	City of Lipan
Priority:	3
Estimated Cost:	$60,000
Estimated Benefit:	$360,000
Potential Funding Source(s):	Local Funds, In- Kind Match, State/Federal Grants
Lead Agency/Department Responsible:	Public Works Department
Implementation Schedule:	18 months
Hazard(s) Addressed	**Flooding**
Action: Install gate and warning lights at low water crossings.	
Participating Jurisdiction	City of Lipan
Priority:	4
Estimated Cost:	$50,000
Estimated Benefit:	$300,000
Potential Funding Source(s):	Local Funds, State or Federal Grants
Lead Agency/Department Responsible:	Public Works Department
Implementation Schedule:	24 months
Hazard(s) Addressed	**Thunderstorms, Tornadoes, Wildfires**
Action: Update and increase the city's outdoor warning system.	
Participating Jurisdiction	City of Lipan
Priority:	5
Estimated Cost:	$120,000
Estimated Benefit:	$720,000
Potential Funding Source(s):	Local Funds, State/Federal Grants
Lead Agency/Department Responsible:	City Administration
Implementation Schedule:	24 months

Hazard(s) Addressed	Earthquake, Expansive Soils, Extreme Heat, Flooding, Thunderstorms, Tornadoes, Wildfires, Winter Storms
Action: Install emergency generators at fire department, community shelter, and future community saferoom.	
Participating Jurisdiction	City of Lipan
Priority:	6
Estimated Cost:	$32,000
Estimated Benefit:	$192,000
Potential Funding Source(s):	Local Funds, State or Federal Grants
Lead Agency/Department Responsible:	Public Works Department
Implementation Schedule:	18 months
Hazard(s) Addressed	**Extreme Heat, Thunderstorms**
Action: Build covered seating at city ball parks to protect attendees from severe weather.	
Participating Jurisdiction	City of Lipan
Priority:	7
Estimated Cost:	$20,000
Estimated Benefit:	$120,000
Potential Funding Source(s):	Local Funds, State and/or Federal Grant Funding
Lead Agency/Department Responsible:	Public Works Department, Lipan ISD
Implementation Schedule:	24 months
Hazard(s) Addressed	**Drought**
Action: Implement an education plan for water conversation guidelines to use in periods of drought.	
Participating Jurisdiction	City of Lipan
Priority:	8
Estimated Cost:	$1,000
Estimated Benefit:	$6,000
Potential Funding Source(s):	Local Funds, State or Federal Grants
Lead Agency/Department Responsible:	Public Works Department
Implementation Schedule:	24 months

Hazard(s) Addressed	Drought, Flooding
Action: Improve dam at Howard Lake to mitigate damage during flood events and provide another water source during drought events.	
Participating Jurisdiction	City of Lipan
Priority:	9
Estimated Cost:	1,000,000
Estimated Benefit:	6,000,000
Potential Funding Source(s):	Local Funds, State/Federal Grants
Lead Agency/Department Responsible:	Public Works Department
Implementation Schedule:	24 months
Hazard(s) Addressed	**Flooding**
Action: Improve roadside drainage ditches and build curbs to increase water flow during flood events.	
Participating Jurisdiction	City of Lipan
Priority:	10
Estimated Cost:	$1,000,000
Estimated Benefit:	$6,000,000
Potential Funding Source(s):	Local Funds, State/Federal Grants, In-Kind Match
Lead Agency/Department Responsible:	Public Works Department
Implementation Schedule:	24 months

City of Tolar Mitigation Action Items

Hazard(s) Addressed	Thunderstorms, Tornadoes, Wildfires
Action: Install and utilize an Outdoor Warning System/Siren and a reverse 9-1-1 call system.	
Participating Jurisdiction	City of Tolar
Priority:	1
Estimated Cost:	$20,000
Estimated Benefit:	$120,000
Potential Funding Source(s):	Local Funds, State/Local Grants, Private Donations
Lead Agency/Department Responsible:	City Administration
Implementation Schedule:	24 months

Hazard(s) Addressed	Earthquakes, Expansive Soils, Heat, Flooding, Thunderstorms, Tornado, Wildfires, Winter Storms
Action: Install emergency generators at city facilities.	
Participating Jurisdiction	City of Tolar
Priority:	2
Estimated Cost:	$75,000
Estimated Benefit:	$450,000
Potential Funding Source(s):	General Funds, State or Federal Grants, Private Donations
Lead Agency/Department Responsible:	Public Works Department
Implementation Schedule:	18 months
Hazard(s) Addressed	**Flooding**
Action: Install gates and warning lights at low water crossings.	
Participating Jurisdiction	City of Tolar
Priority:	3
Estimated Cost:	$50,000
Estimated Benefit:	$300,000
Potential Funding Source(s):	Local Funds, State or Federal Grants
Lead Agency/Department Responsible:	Public Works Department
Implementation Schedule:	24 months
Hazard(s) Addressed	**Flooding**
Action: Improve and expand roadside drainage ditches to increase water flow during flood events.	
Participating Jurisdiction	City of Tolar
Priority:	4
Estimated Cost:	$50,000
Estimated Benefit:	$3000,00
Potential Funding Source(s):	Local Funds, State/Federal Grants, In-Kind Match
Lead Agency/Department Responsible:	Public Works Department
Implementation Schedule:	24 months

Hazard(s) Addressed	Extreme Heat, Winter Storms
Action: Equip and open heating and cooling stations in Tolar to prevent special populations from negative effects of extreme temperatures.	
Participating Jurisdiction	City of Tolar
Priority:	5
Estimated Cost:	$75,000
Estimated Benefit:	$450,000
Potential Funding Source(s):	Local Funds, State and federal grant funding, private donations
Lead Agency/Department Responsible:	City Administration
Implementation Schedule:	24 months
Hazard(s) Addressed	**Thunderstorms, Tornadoes, Winter Storms**
Action: Implement a program for inspection and removal of tree limbs near power lines.	
Participating Jurisdiction	City of Tolar
Priority:	6
Estimated Cost:	$60,000
Estimated Benefit:	$360,000
Potential Funding Source(s):	Local Funds, In- Kind Match, State/Federal Grants
Lead Agency/Department Responsible:	Public Works Department
Implementation Schedule:	18 months
Hazard(s) Addressed	**Wildfire**
Action: Implement a fuel reduction program.	
Participating Jurisdiction	City of Tolar
Priority:	7
Estimated Cost:	$75,000
Estimated Benefit:	$450,000
Potential Funding Source(s):	Local Funds, In-Kind Match, State/Federal Funding
Lead Agency/Department Responsible:	Public Works Department
Implementation Schedule:	24 months

Hazard(s) Addressed	Drought, Earthquakes, Expansive Soils, Heat, Flooding, Thunderstorms, Tornado, Wildfires, Winter Storms
Action: Implement public education program to address the risks and mitigation actions (that public can do at their homes/properties) for the identified hazards using social media, city website, local newspaper, and public outreach.	
Participating Jurisdiction	City of Tolar
Priority:	8
Estimated Cost:	$25,000
Estimated Benefit:	$100,000
Potential Funding Source(s):	General Funds, State and/or Federal Grant Funding
Lead Agency/Department Responsible:	City Administration
Implementation Schedule:	24 months
Hazard(s) Addressed	**Thunderstorms**
Action: Install hail resistant awnings to protect City equipment from storm damage.	
Participating Jurisdiction	City of Tolar
Priority:	9
Estimated Cost:	$10,000
Estimated Benefit:	$60,000
Potential Funding Source(s):	Local Funding, In Kind Match
Lead Agency/Department Responsible:	Public Works Department
Implementation Schedule:	18 months
Hazard(s) Addressed	**Tornadoes**
Action: Create a Community Safe Room in a city building.	
Participating Jurisdiction	City of Tolar
Priority:	10
Estimated Cost:	$400,000
Estimated Benefit:	$2.4 million
Potential Funding Source(s):	Local Funds, CBDG Grant, State/Federal Fund
Lead Agency/Department Responsible:	Public Works Department
Implementation Schedule:	24 months

Hazard(s) Addressed	Tornadoes
Action: Encourage the installation of Individual Safe Rooms.	
Participating Jurisdiction	City of Tolar
Priority:	11
Estimated Cost:	$100,000
Estimated Benefit:	$600,000
Potential Funding Source(s):	Local or Regional Funding, State/Local Grants
Lead Agency/Department Responsible:	Public Works Department
Implementation Schedule:	24 months
Hazard(s) Addressed	**Drought**
Action: Develop an Emergency Plan for drought conditions.	
Participating Jurisdiction	City of Tolar
Priority:	12
Estimated Cost:	$15,000
Estimated Benefit:	$90,000
Potential Funding Source(s):	General Funds, State and/or Federal Grant Funding
Lead Agency/Department Responsible:	City Administration
Implementation Schedule:	24 months
Hazard(s) Addressed	**Drought**
Action: Develop water conversation guidelines to use in periods of drought.	
Participating Jurisdiction	City of Tolar
Priority:	13
Estimated Cost:	$25,000
Estimated Benefit:	$100,000
Potential Funding Source(s):	Donations, user fees, and In-Kind Match
Lead Agency/Department Responsible:	Public Works Department
Implementation Schedule:	18 months

Hazard(s) Addressed	Earthquakes, Expansive Soils, Flooding, Thunderstorms, Tornado, Wildfires, Winter Storms
Action: Develop building standards to assess public and commercial buildings that may be vulnerable to property damage.	
Participating Jurisdiction	City of Tolar
Priority:	14
Estimated Cost:	$25,000
Estimated Benefit:	$100,000
Potential Funding Source(s):	Local Funds, State/Federal Grants
Lead Agency/Department Responsible:	City Code Enforcement Office
Implementation Schedule:	18 months
Hazard(s) Addressed	**Flooding**
Action: Ensure compliance with NFIP requirements.	
Participating Jurisdiction	City of Tolar
Priority:	15
Estimated Cost:	$10,000
Estimated Benefit:	$60,000
Potential Funding Source(s):	Local Funds, State or Federal Grants
Lead Agency/Department Responsible:	Public Works Department
Implementation Schedule:	24 months

Hood County Unincorporated Mitigation Action Items

Hazard(s) Addressed	Thunderstorms
Action: Install lightning rods/grounding on all critical facilities and infrastructure sites.	
Participating Jurisdiction	Hood County Unincorporated
Priority:	1
Estimated Cost:	$100,000
Estimated Benefit:	$600,000
Potential Funding Source(s):	Hazard Mitigation Grants, Capital Budget
Lead Agency/Department Responsible:	Facility Maintenance
Implementation Schedule:	12 months

Hazard(s) Addressed	Earthquakes, Extreme Heat, Flooding, Thunderstorms, Tornadoes, Wildfires, Winter Storms
Action: Install OptiCom encoded signal device at each intersection and each emergency vehicle along major highways to ease emergency vehicle access during high traffic times.	
Participating Jurisdiction	Hood County Unincorporated
Priority:	2
Estimated Cost:	$550,000
Estimated Benefit:	$3.3 million
Potential Funding Source(s):	Hazard Mitigation Grant, Capital Funding
Lead Agency/Department Responsible:	TxDOT, Public Works
Implementation Schedule:	18 months
Hazard(s) Addressed	**Flooding, Thunderstorms, Tornadoes, Earthquake**
Action: Build/install culverts underneath roads that are flooded frequently	
Participating Jurisdiction	Hood County Unincorporated
Priority:	3
Estimated Cost:	$1 million
Estimated Benefit:	$6 million
Potential Funding Source(s):	Hazard mitigation grant, NRCS, Capital Budget
Lead Agency/Department Responsible:	Road Operations
Implementation Schedule:	24 months
Hazard(s) Addressed	**Flooding**
Action: Educate residents on flood hazards who live downstream approximately 5 miles from the dam.	
Participating Jurisdiction	Hood County Unincorporated
Priority:	4
Estimated Cost:	$1,000
Estimated Benefit:	$6,000
Potential Funding Source(s):	Hazard Mitigation Grant, FEMA
Lead Agency/Department Responsible:	Brazos River Authority
Implementation Schedule:	6 months

Hazard(s) Addressed	Flooding
Action: Conduct a hydrologic and hydraulic studies (detailed flood studies) of all Zone "A", Special Flood Hazard Areas and the areas along all the major creeks in the County.	
Participating Jurisdiction	Hood County Unincorporated
Priority:	5
Estimated Cost:	$1 million
Estimated Benefit:	$6 million
Potential Funding Source(s):	Hazard Mitigation Grants, Capital Funding, NRCS
Lead Agency/Department Responsible:	Development-Floodplain Manager
Implementation Schedule:	24 months
Hazard(s) Addressed	**Drought, Earthquakes, Expansive Soils, Extreme Heat, Flooding, Thunderstorms, Tornadoes, Wildfires, Winter Storms**
Action: Implement public education program to address the risks and mitigation actions (that public can do at their homes/properties) for the identified hazards using social media, city website, local newspaper, and public outreach.	
Participating Jurisdiction	Hood County Unincorporated
Priority:	6
Estimated Cost:	$100
Estimated Benefit:	$600
Potential Funding Source(s):	Operating Budget, Grants
Lead Agency/Department Responsible:	Office of Emergency Management
Implementation Schedule:	12 months
Hazard(s) Addressed	**Earthquakes, Expansive Soils, Extreme Heat, Flooding, Thunderstorms, Tornadoes, Wildfires, Winter Storms**
Action: Purchase, install, or update emergency generator at critical facilities to include Justice Center for alternate EOC location, EOC, and Sheriff's Office.	
Participating Jurisdiction	Hood County Unincorporated
Priority:	7
Estimated Cost:	$500,000
Estimated Benefit:	$3 million
Potential Funding Source(s):	Hazard mitigation grant, CDBG, FEMA, Capital Budget
Lead Agency/Department Responsible:	Information Technology
Implementation Schedule:	24 months

Hazard(s) Addressed	Drought, Earthquakes, Expansive Soils, Extreme Heat, Flooding, Thunderstorms, Tornadoes, Wildfires, Winter Storms
Action: Purchase a mobile mapping unit to use during any event to provide route maps, housing counts, damage assessment maps, etc.	
Participating Jurisdiction	Hood County Unincorporated
Priority:	8
Estimated Cost:	$20,000
Estimated Benefit:	$120,000
Potential Funding Source(s):	Hazard Mitigation Grants, Capital Budget
Lead Agency/Department Responsible:	GIS
Implementation Schedule:	12 months
Hazard(s) Addressed	**Drought**
Action: Promote the purchase of crop insurance.	
Participating Jurisdiction	Hood County Unincorporated
Priority:	9
Estimated Cost:	$5,000
Estimated Benefit:	$30,000
Potential Funding Source(s):	Hazard Mitigation Grant, FEMA, USDA
Lead Agency/Department Responsible:	Office of Emergency Management
Implementation Schedule:	6 months
Hazard(s) Addressed	**Flooding**
Action: Become a NFIP CRS community.	
Participating Jurisdiction	Hood County Unincorporated
Priority:	10
Estimated Cost:	$0
Estimated Benefit:	$0
Potential Funding Source(s):	Not Applicable
Lead Agency/Department Responsible:	Office of Emergency Management
Implementation Schedule:	3 months

Hazard(s) Addressed	Drought, Expansive Soils, Extreme Heat, Flooding
Action: Use Smartscape in existing and new developments landscapes	
Participating Jurisdiction	Hood County Unincorporated
Priority:	11
Estimated Cost:	$100,000
Estimated Benefit:	$600,000
Potential Funding Source(s):	County Budget, Grants, Property Owners
Lead Agency/Department Responsible:	Public Works Department
Implementation Schedule:	24 months

4.6 Incorporation into Existing Planning Mechanisms

Based on Requirement 201.6(c)(4(ii) and the State of Texas Mitigation Plan, the vulnerability and capabilities assessment for the town were carefully reviewed and considered when developing the mitigation actions for this plan. The Local Planning Team (LPT) will establish a process in which the mitigation strategy, goals, objectives, and actions outlined in this plan will be incorporated into the existing local planning strategies. At this time, the HazMAP has not been formally integrated into existing planning mechanisms.

Once the plan is adopted, the LPT will coordinate implementation with the responsible parties in the town, as well as external stakeholders as needed.

The following steps will be taken in implementing this HazMAP into local plans:

1. Change is proposed by an elected official or other interested party.
2. Proposal is placed on the local agenda of the governing body.
3. Agenda is published at least 10 days in advance of the meeting at which it will be discussed, so members of the public have an opportunity to attend the discussion meeting. Publication may be made by posting the agenda on the city's website, in the city newsletter, or on a public bulletin board.
4. Proposal is discussed at the planning meeting, including any comments by members of the public attendance.
5. Proposal is voted on by the governing body.
6. If the proposal is passed, the change is implemented by the appropriate party.

Planning mechanisms in which the HazMAP will be integrated are listed below.

Jurisdiction	Type of Plan or Activity	Department Responsible	Update Schedule	Actions to be Integrated
Cresson	Subdivision Ordinance	City Council	As Needed	Reference this HazMAP when reviewing the ordinance.
Granbury	Comprehensive Plan	Planning, Zoning, and Public Works Departments	10 years	Reference this HazMAP when developing the plan.

Jurisdiction	Type of Plan or Activity	Department Responsible	Update Schedule	Actions to be Integrated
Lipan	Comprehensive Plan	Planning, Zoning, and Public Works Departments	10 years	Reference this HazMAP when developing the plan.
Tolar	Comprehensive Plan	Planning, Zoning, and Public Works Departments	10 years	Reference this HazMAP when developing the plan.
Hood County Unincorporated	Emergency Operations Plan	Office of Emergency Management	Annually	Reference this HazMAP when developing the plan.

Although it is recognized that there are many possible benefits to integrating components of this Hazard Mitigation Action Plan (HazMAP) into other planning mechanisms, the participating jurisdictions consider this HazMAP, including development and maintenance, to be the primary vehicle to ensure implementation of local hazard mitigation actions.

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Chapter 5: Conclusion

Through the development of this plan, Hood County has developed a thorough hazard history, an inventory of critical facilities, and an assessment of their current capabilities. This data, when used in conjunction with the updated information about hazard threats and vulnerabilities, will prove to be invaluable to Hood County and its participating jurisdictions.

Natural hazards have been identified county-wide and technological hazards have been listed for selected jurisdictions that opted to include these hazards. Mitigation projects that could reduce the risk of lives and property due to the identified threats have been compiled and prioritized.

The creation of the Hood County Hazard Mitigation Planning Team (HMPT) brought together stakeholders from communities and organizations onto one planning team. This group has been able to work together effectively and efficiently to produce this document and establish a greater awareness of risks and mitigation strategies.

In addition to the HMPT, the creation of the Local Planning Team (LPT) in each jurisdiction brought together stakeholders and departments within the jurisdiction onto one planning team. This group was able to work together effectively and efficiently to produce jurisdictional data for this document and establish a greater awareness of risks and mitigation strategies.

This plan will continue to evolve as necessary to properly represent the threats and vulnerabilities affecting Hood County. Continued public participation is encouraged and will continue through the ongoing multijurisdictional hazard mitigation process. The plan, in its entirety (not limited to but including development, public participation, hazard identification, and mitigation actions), will continue to be monitored and evaluated.

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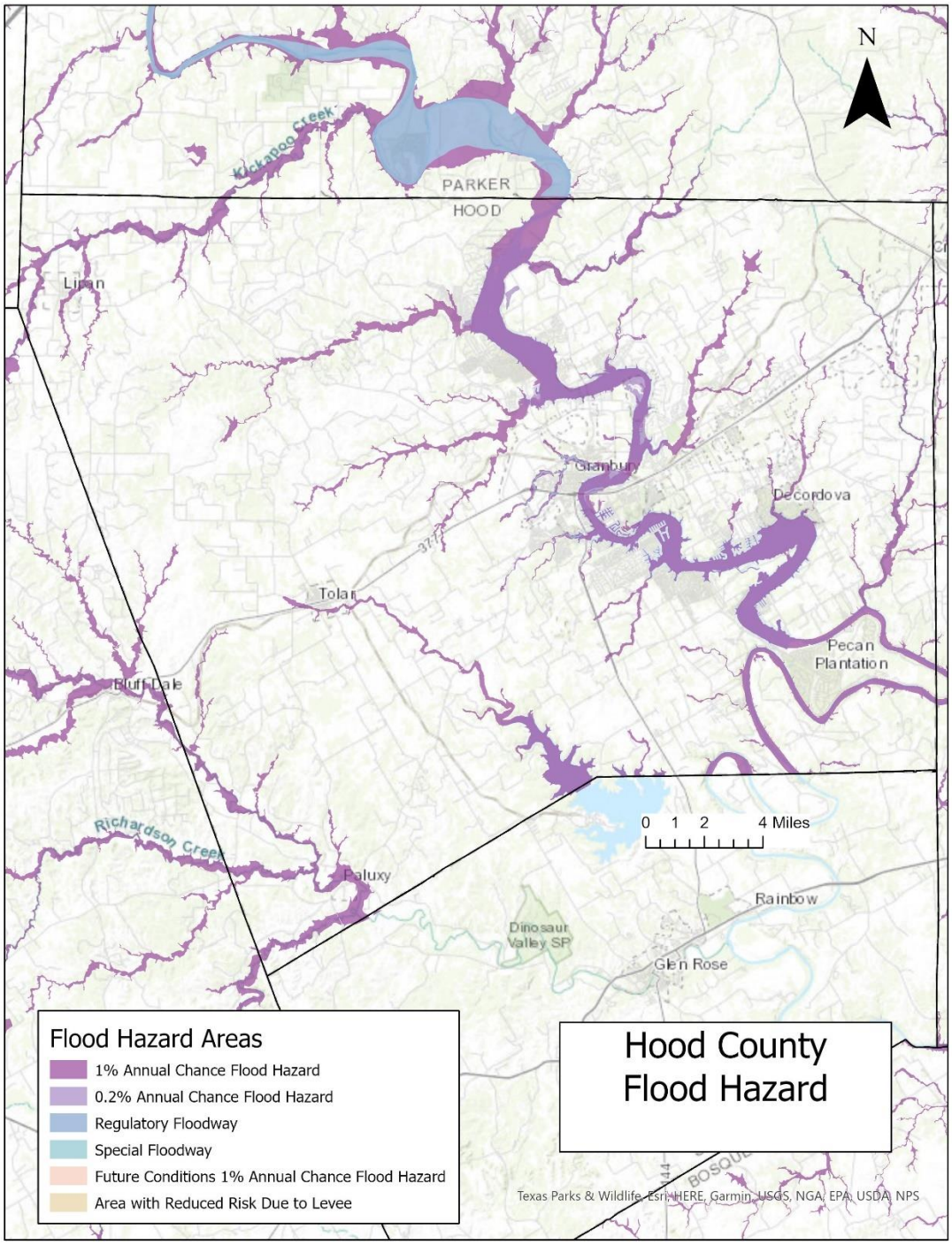
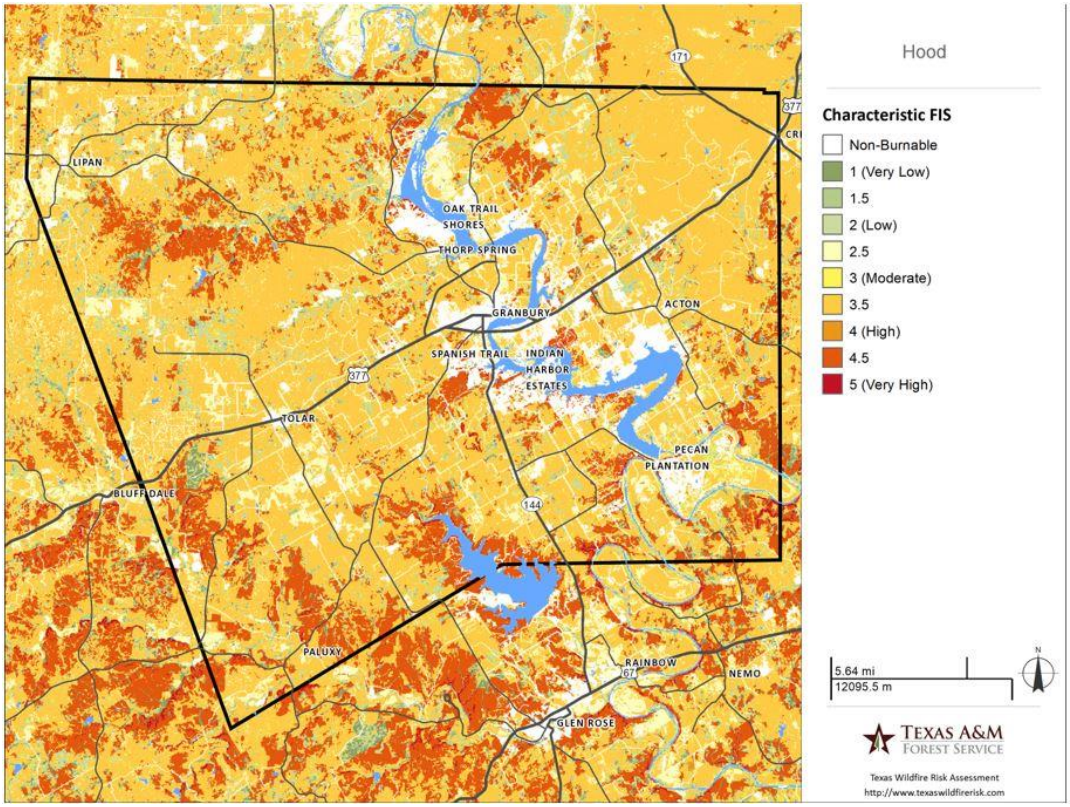
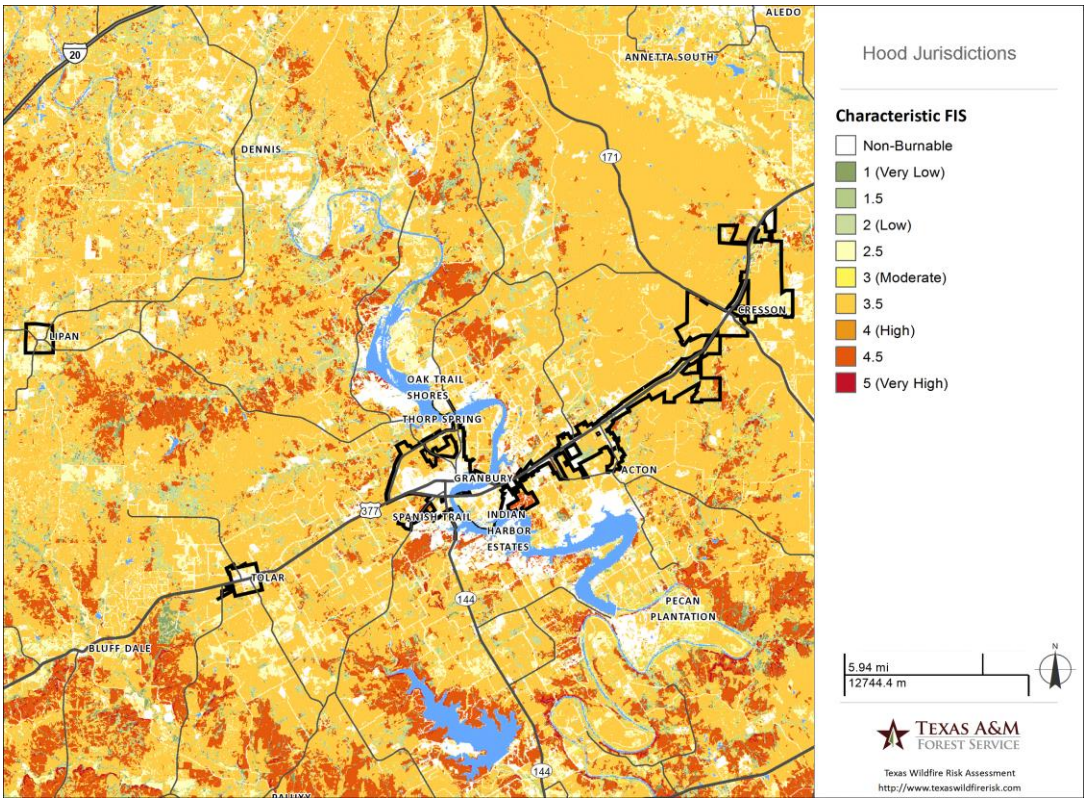
Appendix A: Maps & Tables

Hood County Flood Hazard Map

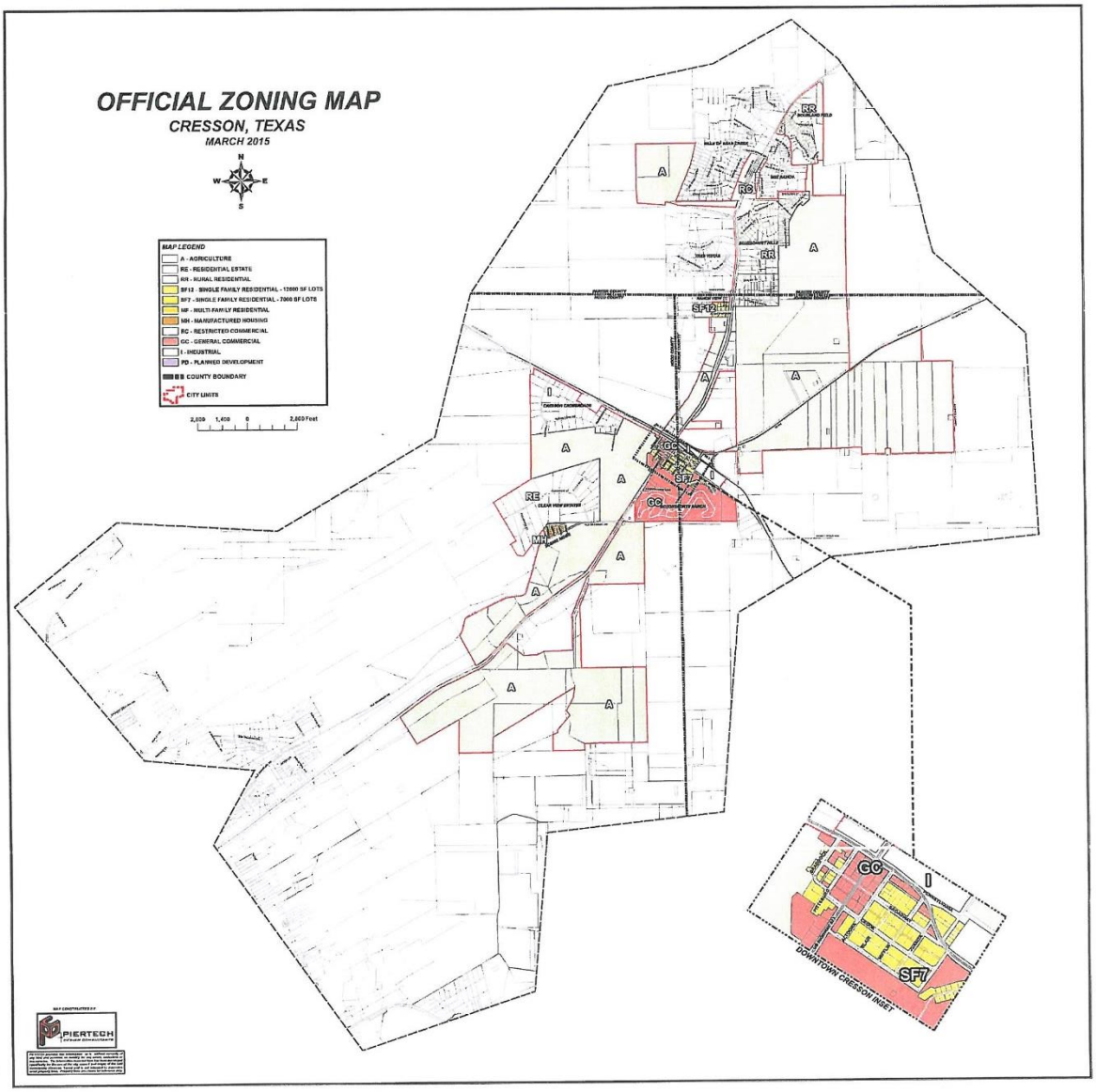


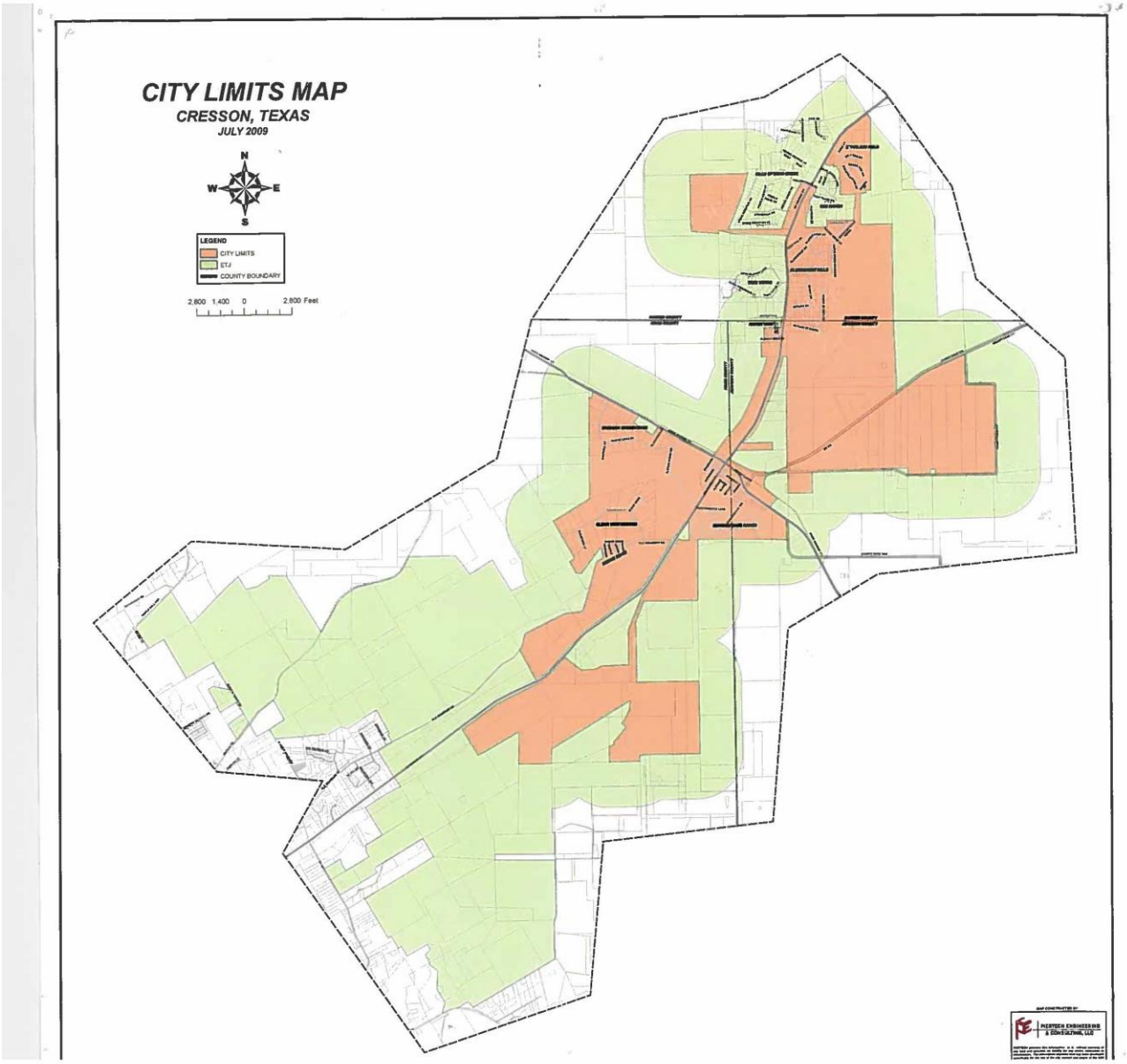
Hood County Fire Intensity Scale Map



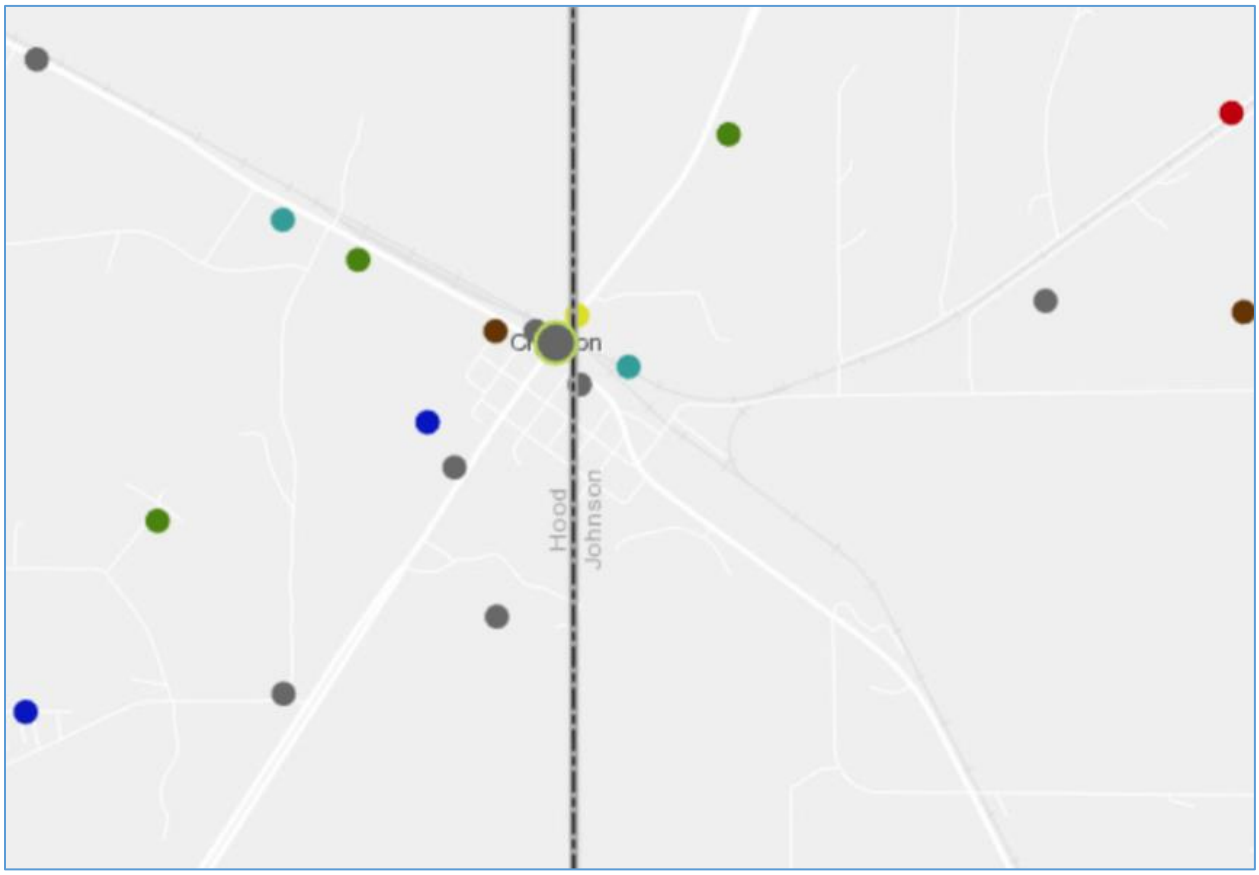


City of Cresson




CITY LIMITS MAP
CRESSON, TEXAS
JULY 2009
N
W
E
S
LEGEND
CITY LIMITS
ETJ
COUNTY BOUNDARY
2,800 1,400 0 2,800 Feet

Wildfire Ignitions, 2005-2015



Wildfire Ignitions

Cause	Cause
Incendiary	Railroads
Lightning	Power Lines
Campfire	Children
Smoking	Debris Burning
Fireworks	Structure
Equipment User	Miscellaneous

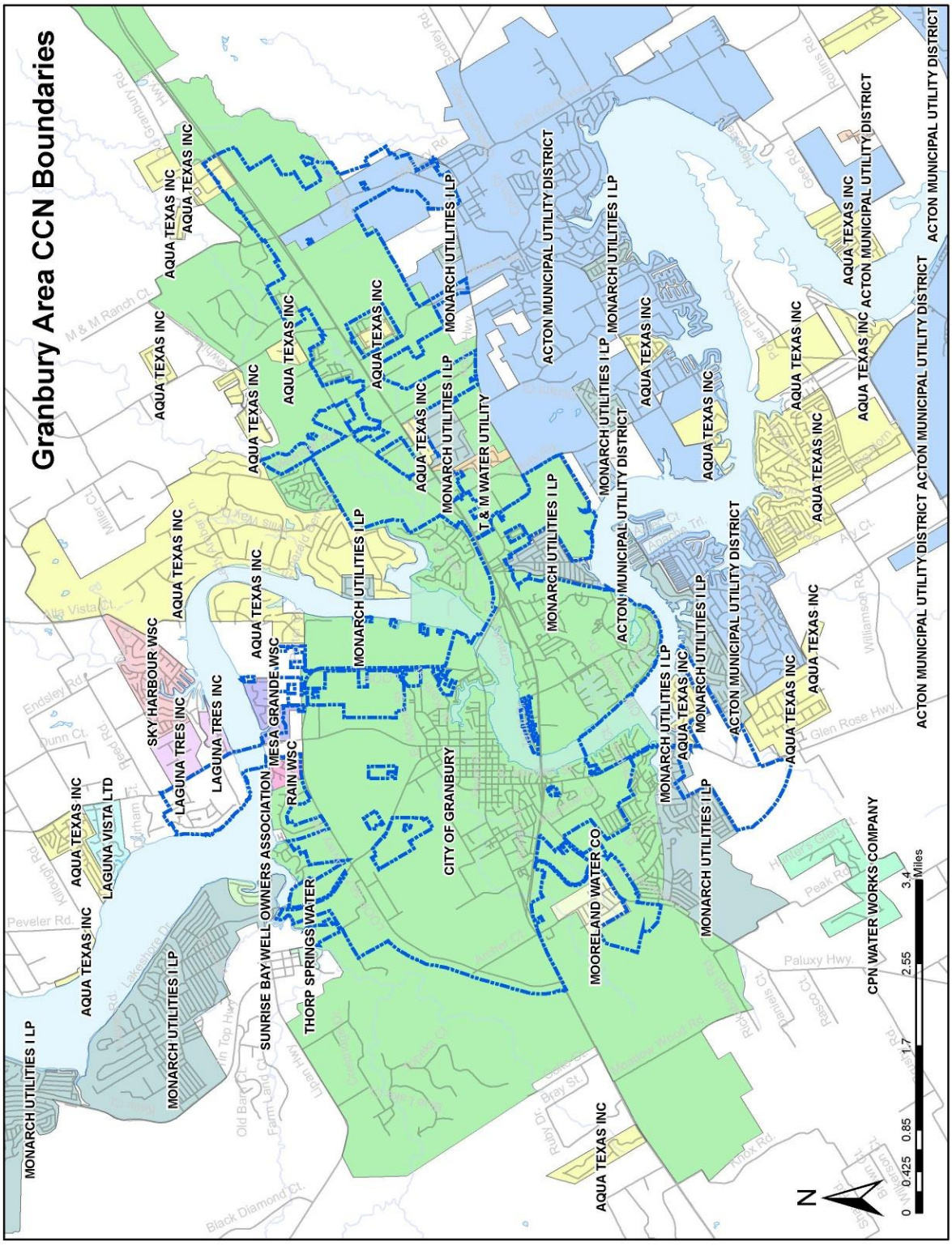
Source: [Texas A&M Forest Service]

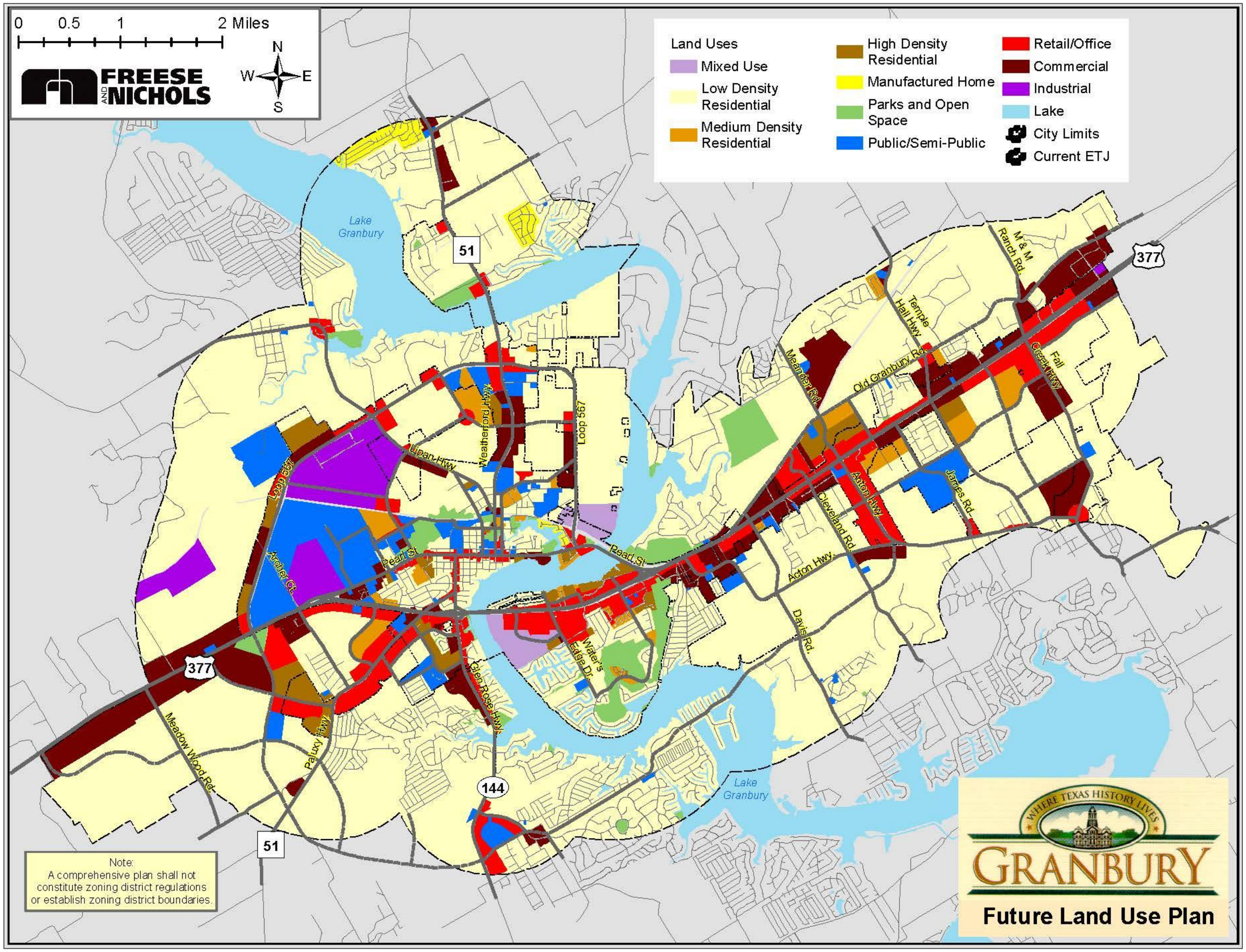
Cresson Critical and Vulnerable Facility & Infrastructure Table

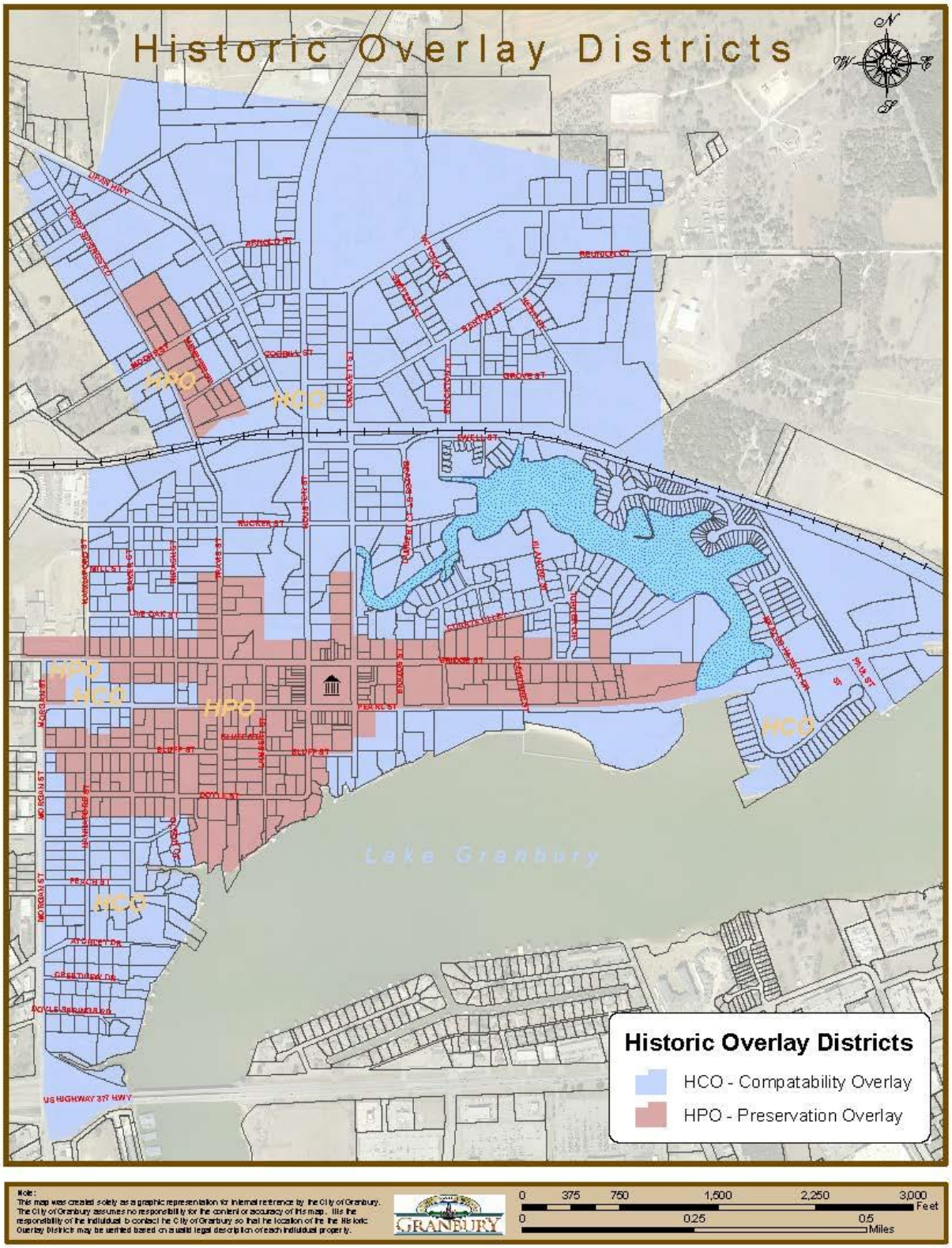
At Risk To: (Y or N)								**Cresson Critical and Vulnerable Facility and Infrastructure Inventory**			
Drought	Expansive Soils	Extreme Heat	Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms	**Facility Name or Description**	**Address**	**Square Feet**	**Structure Value**
N	N	N	N	Y	Y	N	Y	Station 30 VFD	105 S Crook St	12,197	$40,490
N	N	N	N	Y	Y	N	Y	Texaco Cresson	9001 E US Hwy 377	78,219	$702,220
N	N	N	N	Y	Y	N	Y	Cresson Storage	629 Ridgeline Rd		
N	N	N	N	Y	Y	N	Y	Historic Cresson School	9304 Pittsburg St	6,546	$381,600
N	N	N	N	Y	Y	Y	Y	Trim Coat	800 Hughie Long Rd	3,210	$256,160
N	N	N	N	Y	Y	Y	Y	Simms Lumber	2400 N Cresson Hwy	78,313	$1,769,640
N	N	N	N	Y	Y	Y	Y	Vista Sand	3549 Monroe Hwy	1,524,600	$323,980
N	N	N	N	Y	Y	N	Y	Scottish Inn	9120 E US Hwy 377	42,234	$874,300
N	N	N	N	Y	Y	Y	Y	Cam Safety	9201 E US Hwy 377	10,615	$496,450
N	N	N	N	Y	Y	N	Y	Tiger Mart	9521 E US Hwy 377	8,640	$862,610
N	N	N	N	Y	Y	N	Y	Henson Metal	9200 E US Hwy 377	58,160	$595,160
N	N	N	N	Y	Y	Y	Y	Cresson Post Office	9300 Pittsburgh St	3,960	$559.560
N	N	N	N	Y	Y	Y	Y	Henson Lumber	11900 CR 917		
N	N	N	N	Y	Y	N	Y	Cresson City Hall	8901 E US Hwy 377	8,320	$464,310
N	N	N	N	Y	Y	Y	Y	Precision Drilling	1415 Hughie Long Rd	32,300	$2,344,410
N	N	N	N	Y	Y	N	Y	Cresson Storage	629 Ridgeline Rd		
N	N	N	N	Y	Y	N	Y	Historic Cresson School	9304 Pittsburg St	6,546	$381,600
N	N	N	N	Y	Y	Y	Y	Hampel Oil	14237 Ingram		

At Risk To: (Y or N)								**Cresson Critical and Vulnerable Facility and Infrastructure Inventory**			
Drought	Expansive Soils	Extreme Heat	Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms	**Facility Name or Description**	**Address**	**Square Feet**	**Structure Value**
N	N	N	N	Y	Y	Y	Y	Integrity Biochem	1100 N Cresson Hwy	11,810	$531,500
N	N	N	N	Y	Y	Y	Y	Tri Chem	2600 N Cresson Hwy	33,220	$1,130,210

City of Granbury




0 0.5 1 2 Miles
FREESE AND NICHOLS
N
W
E
S
Land Uses
Mixed Use
Low Density Residential
Medium Density Residential
High Density Residential
Manufactured Home
Parks and Open Space
Public/Semi-Public
Retail/Office
Commercial
Industrial
Lake
City Limits
Current ETJ
Lake Granbury
51
377
144
M & M Ranch Rd.
Temple Hall Hwy
Old Granbury Rd.
Fall Creek Hwy
Meander Rd.
James Rd.
Anton Hwy
Cleveland Rd.
Acton Hwy
Davis Rd.
Loop 567
Weatherford Hwy
Lipan Hwy
Pearl St.
Archer Ct.
Water's Edge Dr.
Glen Rose Hwy
Paluxy Hwy
Meadow Wood Rd.
Note:
A comprehensive plan shall not constitute zoning district regulations or establish zoning district boundaries.
WHERE TEXAS HISTORY LIVES
GRANBURY
Future Land Use Plan

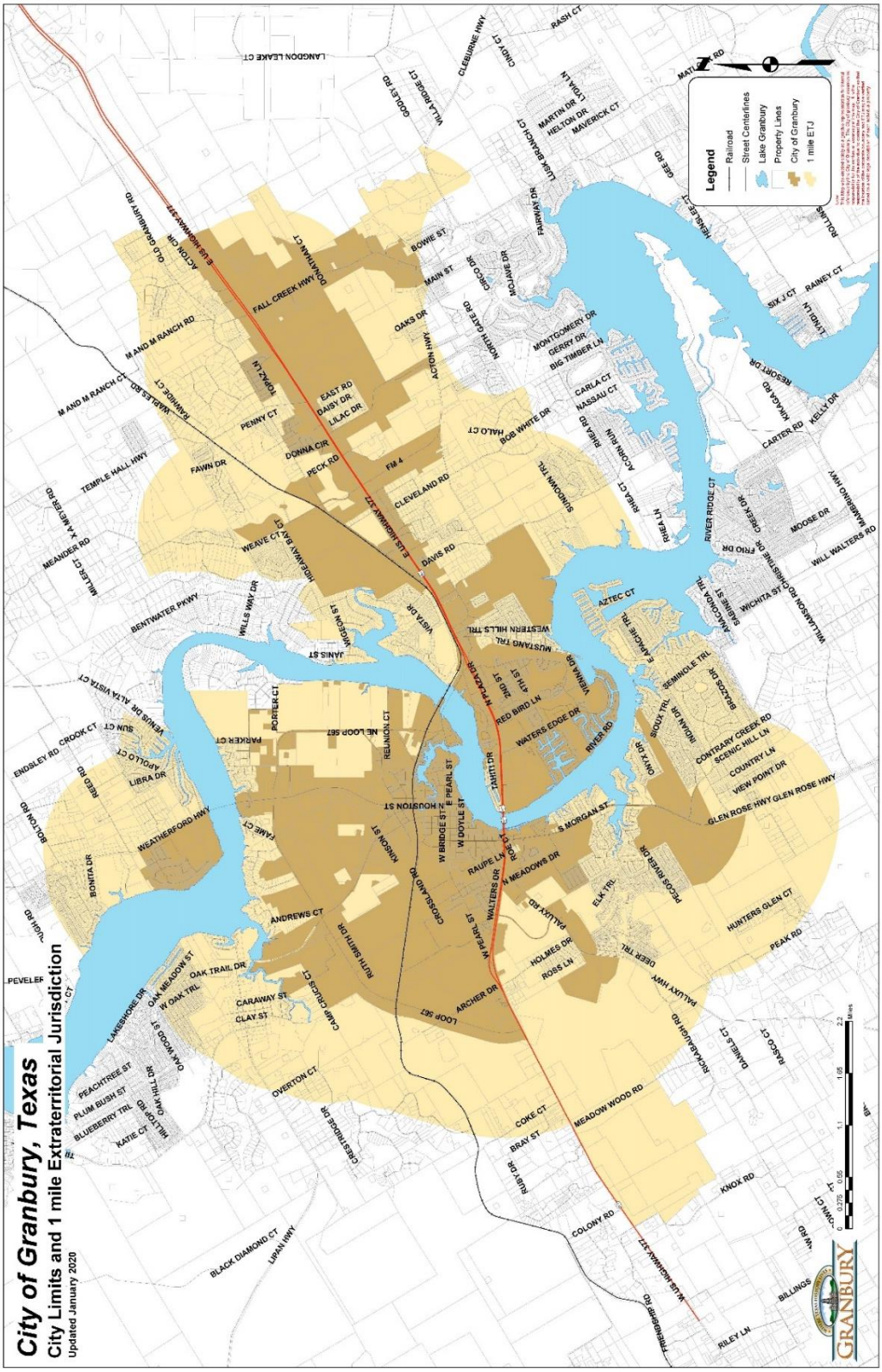


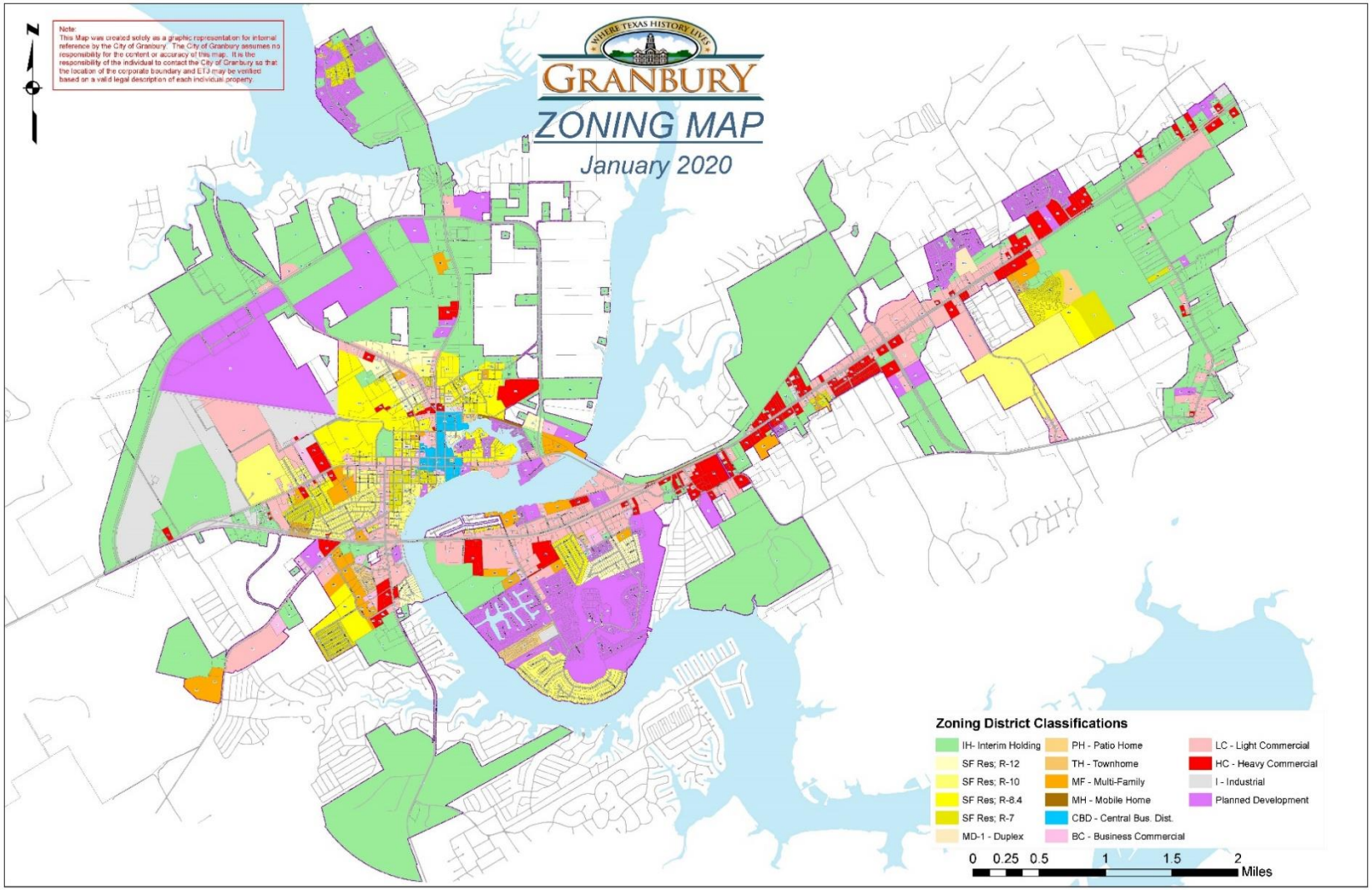
Note:
This map was created solely as a graphic representation for internal reference by the City of Granbury. The City of Granbury assumes no responsibility for the content or accuracy of this map. It is the responsibility of the individual to contact the City of Granbury so that the location of the the Historic Overlay District may be verified based on a valid legal description of each individual property.

GRANBURY

0 375 750 1,500 2,250 3,000 Feet

0 0.25 0.5 Miles


City of Granbury, Texas
City Limits and 1 mile Extraterritorial Jurisdiction
Updated January 2020
Legend
Railroad
Street Centerlines
Lake Granbury
Property Lines
City of Granbury
1 mile ETJ
GRANBURY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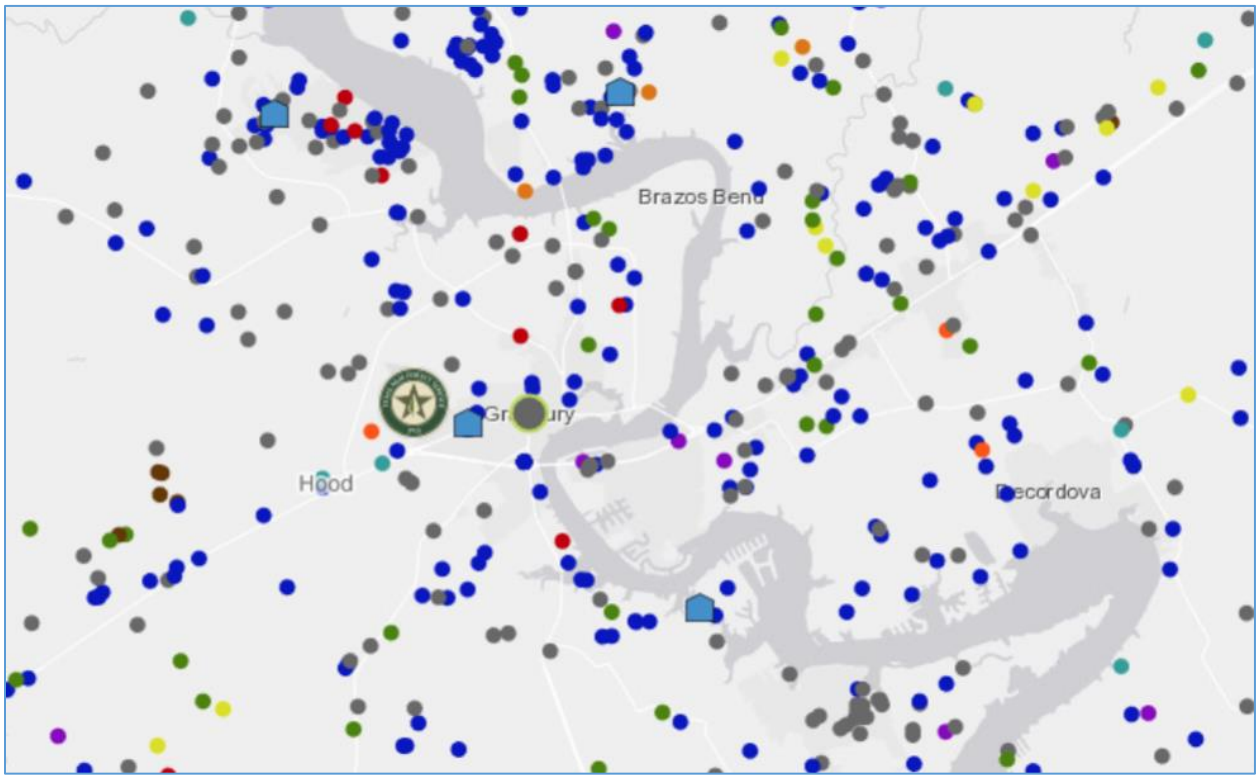
N
WHERE TEXAS HISTORY LIVES
GRANBURY
ZONING MAP
January 2020
Zoning District Classifications
IH- Interim Holding
SF Res; R-12
SF Res; R-10
SF Res; R-8.4
SF Res; R-7
MD-1 - Duplex
PH - Patio Home
TH - Townhome
MF - Multi-Family
MH - Mobile Home
CBD - Central Bus. Dist.
BC - Business Commercial
LC - Light Commercial
HC - Heavy Commercial
I - Industrial
Planned Development
0 0.25 0.5 1 1.5 2
Miles

Wildfire Ignitions, 2005-2015



Source: [Texas A&M Forest Service]

Granbury Critical and Vulnerable Facility & Infrastructure Table

At Risk To: (Y or N)								**Granbury Critical and Vulnerable Facility and Infrastructure Inventory**			
Drought	Expansive Soils	Extreme Heat	Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms	**Facility Name or Description**	**Address**	**Square Feet**	**Structure Value**
N	N	N	N	Y	Y	N	Y	TX EMS Ambulance Service	2200 Commercial Lane	162,043	$286,970

At Risk To: (Y or N)								Granbury Critical and Vulnerable Facility and Infrastructure Inventory			
Drought	Expansive Soils	Extreme Heat	Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms	**Facility Name or Description**	**Address**	**Square Feet**	**Structure Value**
N	N	N	N	Y	Y	N	Y	First National Bank - Granbury	101 East Bridge Street	14,985	$1,395,790
N	N	N	N	Y	Y	N	Y	First National Bank – Granbury	1905 South Morgan Street	91,650	$480,910
N	N	N	N	Y	Y	N	Y	BBVA Compass	702 West Pearl Street	16,290	$1,349,030
N	N	N	N	Y	Y	N	Y	Chase Bank	1050 East W Hwy 377		$242,670
N	N	N	N	Y	Y	N	Y	Prosperity Bank	3900 East US Why 377	41,730	$2,004,180
N	N	N	N	Y	Y	N	Y	First Financial Bank	1600 South Morgan	60,243	$1,331,390
N	N	N	N	Y	Y	N	Y	Independent Bank	500 South Morgan Street	59,982	$1,295,830
N	N	N	N	Y	Y	Y	Y	Lake Granbury Detention Center	1300 Crossland Road	58,784	$4,952,020
N	N	N	N	Y	Y	N	Y	Station 10 VFD	1701 West Pearl Street	7,500	$621,540
N	N	N	N	Y	Y	N	Y	76 – Gas Station	321 South Morgan Street	10,983	$425,160
N	N	N	N	Y	Y	N	Y	E-Z Mart	535 South Morgan Street	18,041	$338,550
N	N	N	N	Y	Y	N	Y	Granbury Chevron	407 West Pearl Street	10,571	$320,050
N	N	N	N	Y	Y	N	Y	Tommy’s Food Stores Inc	311 South Morgan Street	6,002	$425,160
N	N	N	N	Y	Y	N	Y	E-Z Mart	2201 South Morgan Street	6,249	$129,030

At Risk To: (Y or N)								Granbury Critical and Vulnerable Facility and Infrastructure Inventory			
Drought	Expansive Soils	Extreme Heat	Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms	**Facility Name or Description**	**Address**	**Square Feet**	**Structure Value**
N	N	N	N	Y	Y	N	Y	H-E-B Fuel	3804 East US Hwy 377	46,435	$496,130
N	N	N	N	Y	Y	N	Y	Hood County Annex 1	1402 W Pearl Street	107,418	$1,250,370
N	N	N	N	Y	Y	N	Y	Hood County Courthouse	100 East Pearl Street	59,995	$6,813,130
N	N	N	N	Y	Y	N	Y	Granbury City Hall	116 Bridge Street	130,523	$7,684,720
N	N	N	N	Y	Y	N	Y	Hood County Vehicle Reg	1410 W Pearl Street	107,418	$1,250,370
N	N	N	N	Y	Y	N	Y	H-E-B	3804 East US Hwy 377	322,786	$8,556,460
N	N	N	N	Y	Y	N	Y	Brookshire's	1301 S Morgan Street	48,660	$1,591,610
N	N	N	N	Y	Y	Y	Y	Wal – Mart Supercenter	735 East US Hwy 377	1,038,296	$6,113,910
N	N	N	N	Y	Y	N	Y	ALDI	1339 Plaza Drive N	109,205	$2,700,570
N	N	N	N	Y	Y	N	Y	Kroger Marketplace	3915 East US Hwy 377	384,846	$11,000,000
N	N	N	N	Y	Y	N	Y	Granbury Depot	109 Ewell Street	1,398	$32,900
N	N	N	N	Y	Y	N	Y	Nutt House	208 North Crockett Street	8,600	$1,075,120
N	N	N	N	Y	Y	N	Y	Bridge Street Historical Museum	319 East Bridge Street	19,036	$274,890
N	N	N	N	Y	Y	N	Y	Lake Granbury Medical Center	1310 Paluxy Road	427,214	$13,081,270
N	N	N	N	Y	Y	N	Y	Ruth's Place Clinic	1411 CrawfoRoad Court	23,087	$296,160
N	N	N	N	Y	Y	N	Y	Lakeside Physicians Family Medicine	1322 Paluxy Road	17,420	$1,023,020

At Risk To: (Y or N)								Granbury Critical and Vulnerable Facility and Infrastructure Inventory			
Drought	Expansive Soils	Extreme Heat	Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms	**Facility Name or Description**	**Address**	**Square Feet**	**Structure Value**
N	N	N	N	Y	Y	N	Y	Granbury Minor Emergency	602 East US Hwy 377	1,120	$11,000
N	N	N	N	Y	Y	N	Y	Lake Granbury Specialty Care	1308 Paluxy Road	6,220	$633,510
N	N	N	N	Y	Y	N	Y	Luton Strip Center	3710 East US Hwy 377	17,166	$2,417,180
N	N	N	N	Y	Y	N	Y	Baylor Surgicare at Granbury	1717 Paluxy Road	37,072	$2,484,430
N	N	N	N	Y	Y	N	Y	CVS	1101 East US 377	54,065	$1,563,030
N	N	N	N	Y	Y	N	Y	Granbury Drug	602 South Morgan Street	10,067	$507,120
N	N	N	N	Y	Y	N	Y	Best Value Ron's Pharmacy	420 West Pearl Street	10,763	$359,800
N	N	N	N	Y	Y	N	Y	Walgreens Pharmacy	1050 East US Hwy 377	39,433	$1,539,310
N	N	N	N	Y	Y	N	Y	Granbury City Hall	116 West Bridge Street # B	31,550	$7,684,720
N	N	N	N	Y	Y	N	Y	The Pet Hospital of Granbury	1851 Acton Hwy	17,164	$1,375,980
N	N	N	N	Y	Y	N	Y	Hood County Sheriff Office	400 Deputy Larry Miller Drive	54,856	$6,960,190
N	N	N	N	Y	Y	N	Y	L & R Radio Group	1620 Weatherford Hwy	2,448	$144,450
N	N	N	N	Y	Y	N	Y	Avalon Strip Center	1030 East US Hwy 377 Suite 114	48,680	$3,848,510
N	N	N	N	Y	Y	N	Y	Dr Smith Complex	805 Hill Boulevard #101	21,106	$3,867,630
N	N	N	N	Y	Y	N	Y	C.G. Laboratories	1410 Southtown Drive	7,500	$366,060

At Risk To: (Y or N)								Granbury Critical and Vulnerable Facility and Infrastructure Inventory			
Drought	Expansive Soils	Extreme Heat	Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms	**Facility Name or Description**	**Address**	**Square Feet**	**Structure Value**
N	N	N	N	Y	Y	N	Y	Paluxy Medical Plaza	1205 Medical Plaza Court	15,472	$2,484,430
N	N	N	N	Y	Y	N	Y	Lake Granbury Imaging Center	1220 Paluxy Medical Circle	Unknown	$325,920
N	N	N	N	Y	Y	N	Y	Granbury Animal Clinic	1319 Lipan Hwy	14,332	$568,070
N	N	N	N	Y	Y	Y	Y	Town & Country Animal Clinic	4626 East US Hwy 377	6,921	$500,960
N	N	N	N	Y	Y	N	Y	Acton Animal Hospital	2900 Fall Creek Hwy	3,821	$343,340
N	N	N	N	Y	Y	Y	Y	La Paloma Small Animal Hospital	4238 East US Hwy 377	2,660	$194,110
N	N	N	N	Y	Y	N	Y	Granbury Convention Center	505 East Pearl Street	21,260	$5,427,160
N	N	N	N	Y	Y	Y	Y	Shanley Park	100 West Bridge Street	49,702	$74,550
N	N	N	N	Y	Y	N	Y	Creations Child Care & Learning	2111 East US Hwy 377	4,959	$290,460
N	N	N	N	Y	Y	N	Y	Busy Bee Preschool	415 South Morgan Street	2,466	$138,100
N	N	N	N	Y	Y	N	Y	Lake Granbury Montessori Academy	2400 Fall Creek Hwy	5,142	$231,220
N	N	N	N	Y	Y	Y	Y	Reunion Grounds	641 Reunion Court	51,223	$1,820,500
N	N	N	N	Y	Y	N	Y	StoneWater Church	911 East Hwy 377	58,611	$4,338,920
N	N	N	N	Y	Y	N	Y	Granbury Church of Christ	1905 West Pearl Street	62,329	$5,880,430
N	N	N	N	Y	Y	N	Y	Calvary Baptist	1107 Weatherford Hwy	5,681	$626,650

At Risk To: (Y or N)								Granbury Critical and Vulnerable Facility and Infrastructure Inventory			
Drought	Expansive Soils	Extreme Heat	Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms	**Facility Name or Description**	**Address**	**Square Feet**	**Structure Value**
N	N	N	N	Y	Y	N	Y	Granbury Baptist Church	1200 Weatherford Hwy	19,986	$2,370,520
N	N	N	N	Y	Y	N	Y	Granbury First Methodist Church	301 Loop 567	Unknown	$538,400
N	N	N	N	Y	Y	N	Y	Granbury Church of God	1106 Weatherford Hwy	14,976	$1,625,710
N	N	N	N	Y	Y	N	Y	First Baptist Church	1851 Weatherford Hwy	75,757	$7,687,640
N	N	N	N	Y	Y	N	Y	First Presbyterian Church	303 West Bridge Street	3,155	$220,990
N	N	N	N	Y	Y	N	Y	Our Savior Lutheran Church	1400 West Meadows Drive	18,687	$3,474,990
N	N	N	N	Y	Y	N	Y	Old Granbury Road Church of Christ	4219 Old Granbury Road	3,600	$532,740
N	N	N	N	Y	Y	N	Y	Southside Baptist Church	910 Paluxy Road	27,078	$2,529,310
N	N	N	N	Y	Y	N	Y	Church of Nazarene	921 North Lipan Drive	5,455	$660,660
N	N	N	N	Y	Y	N	Y	Sovereign Grace Baptist Church	820 Paluxy Road	2,491	$105,670
N	N	N	N	Y	Y	N	Y	Crossing Place	1900 West Hwy 377	12,860	$1,279,090
N	N	N	N	Y	Y	N	Y	Downtown Church of Christ	310 West Pearl Street	7,333	$484,360
N	N	N	N	Y	Y	N	Y	Brazos Covenant Ministries	1950 Acton Hwy	15,374	Unknown
N	N	N	N	Y	Y	Y	Y	St Frances Cabrini Catholic Church	2301 Acton Hwy	56,271	Unknown

At Risk To: (Y or N)								Granbury Critical and Vulnerable Facility and Infrastructure Inventory			
Drought	Expansive Soils	Extreme Heat	Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms	**Facility Name or Description**	**Address**	**Square Feet**	**Structure Value**
N	N	N	N	Y	Y	N	Y	Grace Bible Church	201 East Clifton Road	17,239	Unknown
N	N	N	N	Y	Y	N	Y	Faith Assembly of God	300 Granbury Court	7,202	Unknown
N	N	N	N	Y	Y	N	Y	Bible Baptist Church	4804 East US Hwy 377	14,768	$2,281,770
N	N	N	N	Y	Y	N	Y	La Quinta Inn & Suites Granbury	880 Harbor Lakes Drive	39,268	$2,890,500
N	N	N	N	Y	Y	N	Y	Holiday Inn Express & Suites Granbury	1515 Plaza Drive North	38,008	$2,450,000
N	N	N	N	Y	Y	N	Y	Hilton Garden Inn Granbury	635 East Pearl Street	Unknown	$1,437,480
N	N	N	N	Y	Y	N	Y	Granbury Inn and Suites	1335 Plaza Drive	17,816	$2,700,570
N	N	N	N	Y	Y	N	Y	The Historic Nutt House Hotel	119 E Bridge Street	8,600	$1,075,120
N	N	N	N	Y	Y	N	Y	Inn on Lake Granbury	205 West Doyle Street	10,112	$1,290,020
N	N	N	N	Y	Y	N	Y	Days Inn Granbury	1201 Plaza Drive	25,224	$1,117,210
N	N	N	N	Y	Y	N	Y	Classic Inn	1209 Plaza Drive	21,488	$676,700
N	N	N	N	Y	Y	N	Y	Plantation Inn & Suites	1451 East Pearl Street	30,040	$1,212,400
N	N	N	N	Y	Y	N	Y	Quality Inn & Suites Granbury	800 Harbor Lakes Drive	29,132	$1,408,380
N	N	N	N	Y	Y	N	Y	Best Western Granbury Inn & Suites	1517 Plaza Drive	37,458	$1,700,000
N	N	N	N	Y	Y	N	Y	Granbury Sleep Inn	1545 Plaza Drive North	38,006	$2,450,000
N	N	N	N	Y	Y	N	Y	Comfort Suites	903 Harbor Lakes Drive	50,735	$2,764,470
N	N	N	N	Y	Y	N	Y	Granbury Gardens Bed & Breakfast	321 West Doyle Street	4,261	$324,290

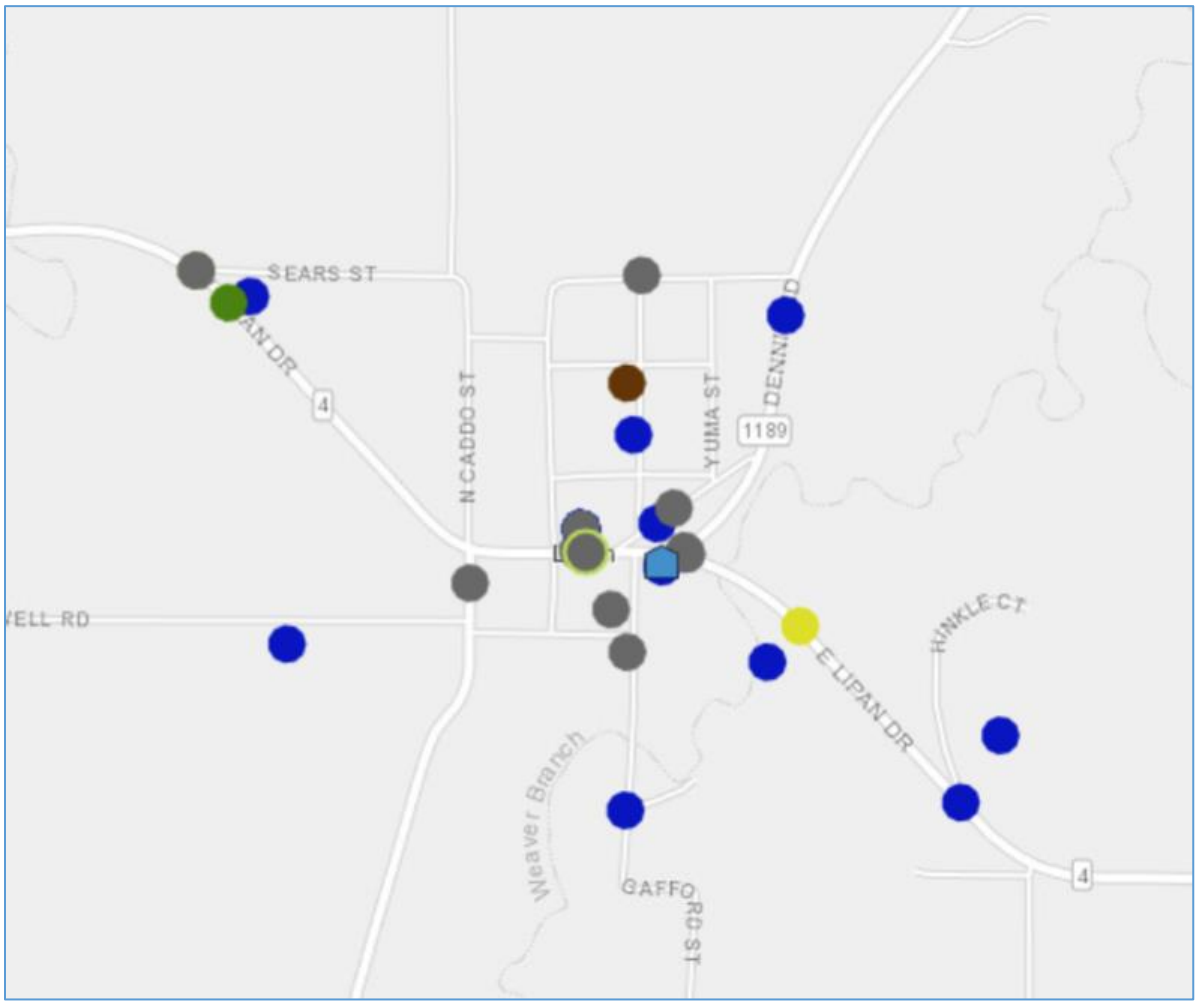
At Risk To: (Y or N)								Granbury Critical and Vulnerable Facility and Infrastructure Inventory			
Drought	Expansive Soils	Extreme Heat	Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms	**Facility Name or Description**	**Address**	**Square Feet**	**Structure Value**
N	N	N	N	Y	Y	N	Y	Iron Horse Inn	616 Thorp Springs Road	6,412	$601,120
N	N	N	N	Y	Y	N	Y	Casa Farina	202 North Houston Street	8,700	$754,430
N	N	N	N	Y	Y	N	Y	Baker Street Harbour	511 South Baker Street	5,547	$123,160
N	N	N	N	Y	Y	N	Y	Pomegranate House and Cottages Bed and Breakfast	1002 West Pearl Street	3,162	$246,830
N	N	N	N	Y	Y	N	Y	Lambert Street Guesthouse	215 S Lambert Street	1,484	$92,200
N	N	N	N	Y	Y	N	Y	Sunnyside RV Park	2600 West Hwy 377	235,485	$241,950
N	N	N	N	Y	Y	N	Y	Granbury Care Center	301 S Park Street	54,821	$3,493,880
N	N	N	N	Y	Y	N	Y	Trinity Missions	600 Reunion Court	22,027	$1,533,280
N	N	N	N	Y	Y	N	Y	Courtyards at Lake Granbury	801 Calinco Drive	104,520	$5,570,440
N	N	N	N	Y	Y	N	Y	Waterview The Cove Assisted Living & Memory Care	101 Watermark Boulevard	85,191	$9,497,020
N	N	N	N	Y	Y	N	Y	The Oaks of Granbury	1017 North Lipan Drive	24,695	$1,620,270
N	N	N	N	Y	Y	N	Y	Granbury Villa Rehab & Nursing	2124 Paluxy Hwy	25,993	$1,854,940
N	N	N	N	Y	Y	N	Y	Senior Care of Harbor Lakes	1300 2nd Street	41,031	$4,110,590
N	N	N	N	Y	Y	N	Y	Waterview The Point Independent Living	100 Watermark Boulevard	129,294	$12,644,990
N	N	N	N	Y	Y	N	Y	Lakestone Terrace Senior Living	916 East US Hwy 377	116,968	$6,922,050

At Risk To: (Y or N)								Granbury Critical and Vulnerable Facility and Infrastructure Inventory			
Drought	Expansive Soils	Extreme Heat	Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms	**Facility Name or Description**	**Address**	**Square Feet**	**Structure Value**
N	N	N	N	Y	Y	N	Y	Magnolia Court	2310 Paluxy Hwy	163,369	$5,160,390
N	N	N	N	Y	Y	N	Y	Bridgewater Memory Care	900 Autumn Ridge Drive	27,091	$2,799,650
N	N	N	N	Y	Y	N	Y	Home Instead Senior Care	983 Whitehead Drive, Suite 106	8,440	$755,720
N	N	N	N	Y	Y	N	Y	Hood County Senior Center	501 East Moore Street	9,862	$1,584,760
N	N	N	N	Y	Y	N	Y	Granbury Middle School	2000 Crossland Road	4,160,546	$24,846,960
N	N	N	N	Y	Y	N	Y	STARS Accelerate High School	301 North Hannaford Street	217,800	$5,529,470
N	N	N	N	Y	Y	N	Y	Netti Baccus Elementary School	901 Loop 567	827,640	$1,241,460
N	N	N	N	Y	Y	N	Y	John and Lynn Brawner Intermediate School	1520 South Meadows Drive	71,975	$8,778,080
N	N	N	N	Y	Y	N	Y	Granbury High School	2000 West Pearl Street	73,174	$7,882,310
N	N	N	N	Y	Y	N	Y	Shape Academy	910 Paluxy Road	27,042	$2,529,310
N	N	N	N	Y	Y	N	Y	Oak Woods School	311 Davis Road	408,593	$5,772,560
N	N	N	N	Y	Y	N	Y	Emma Roberson Elementary School	1500 Misty Meadows Drive	436,471	$7,807,060
N	N	N	N	Y	Y	N	Y	Weatherford College Education Center at Granbury	210 North Jones Street	217,800	$5,529,470
N	N	N	N	Y	Y	N	Y	Pirates Den Sports Center	304 North Park Street	3,550	$180,670

At Risk To: (Y or N)								**Granbury Critical and Vulnerable Facility and Infrastructure Inventory**			
Drought	Expansive Soils	Extreme Heat	Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms	**Facility Name or Description**	**Address**	**Square Feet**	**Structure Value**
N	N	N	N	Y	Y	N	Y	Granbury Regional Airport	400 Howard Clemmons Road	2,787,840	$6,770,860

City of Lipan

Wildfire Ignitions, 2005-2015



Source: [Texas A&M Forest Service]

Lipan Critical and Vulnerable Facility & Infrastructure Table

At Risk To: (Y or N)								**Lipan Critical and Vulnerable Facility and Infrastructure Inventory**			
Drought	Expansive Soils	Extreme Heat	Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms	**Facility Name or Description**	**Address**	**Square Feet**	**Structure Value**
N	N	N	N	Y	Y	N	Y	Station 60 VFD	204 East Lipan Drive	4,000	$310,840
N	N	N	N	Y	Y	N	Y	Thorp Springs Church of Christ	3006 Thorp Street	4,598	$343,040
N	N	N	N	Y	Y	Y	Y	Lipan Water Works	105 East Lipan Drive	1,800	$31,110
N	N	N	N	Y	Y	N	Y	Masonic Lodge	207 North Kickapoo	3,458	$211,780
N	N	N	N	Y	Y	N	Y	CJ's Beauty Shop	106 East Lipan Drive	1,833	$91,810
N	N	N	N	Y	Y	Y	Y	Walter Balderee CPA	9420 Evergreen Cemetery	4,308	$126,180
N	N	N	N	Y	Y	N	Y	City Hall	105 East Lipan Drive	1,800	$31,110
N	N	N	N	Y	Y	N	Y	RR Feed Stores	107 East Lipan Drive	Unknown	Unknown
N	N	N	N	Y	Y	N	Y	First Baptist Church	214 North Kickapoo Street	9,991	$427,350
N	N	N	N	Y	Y	N	Y	Church of Christ	112 North Caddo Street	2,444	$98,700
N	N	N	N	Y	Y	N	Y	Community Center	202 West Lipan Street	2,205	$374,030
N	N	N	N	Y	Y	Y	Y	Circle H 2	111 West Lipan Drive	3,796	$258,280
N	N	N	N	Y	Y	N	Y	Dollar General	222 West Lipan Drive	Unknown	Unknown
N	N	N	N	Y	Y	N	Y	County Yard Burn	221 West Lipan Drive	Unknown	Unknown
N	N	N	N	Y	Y	N	Y	Fire Station	201 West Lipan Drive	Unknown	Unknown
N	N	N	N	Y	Y	Y	Y	Sewer Plant	11199 Light Rd	Unknown	Unknown
N	N	N	N	Y	Y	N	Y	A & A Garage	108 East Brown	1,035	$35,500

At Risk To: (Y or N)								Lipan Critical and Vulnerable Facility and Infrastructure Inventory			
Drought	Expansive Soils	Extreme Heat	Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms	**Facility Name or Description**	**Address**	**Square Feet**	**Structure Value**
N	N	N	N	Y	Y	Y	Y	City Park	123 Sears Street	Unknown	Unknown
N	N	N	N	Y	Y	Y	Y	City Well	8037 Star Hollow	Unknown	Unknown
N	N	N	N	Y	Y	N	Y	Flat Bread House	110 East Lipan Drive	2,124	$16,700
N	N	N	N	Y	Y	N	Y	Lipan Tabernacle	114 N Caddo Street	13,068	$17,000
N	N	N	N	Y	Y	N	Y	Wiley's Funeral Home	108 East Lipan Drive	5,890	$21,550
N	N	N	N	Y	Y	N	Y	Super Dave Cheese Factory	104 East Lipan Drive	3,204	$41,730
N	N	N	N	Y	Y	N	Y	Lipan First National Bank	101 East Lipan Drive	13,939	$101,790
N	N	N	N	Y	Y	N	Y	Marcantonio's Bakery	103 East Lipan Drive	1,830	$74,660
N	N	N	N	Y	Y	N	Y	Post Office	106 West Lipan Drive	Unknown	Unknown
N	N	N	N	Y	Y	N	Y	Lipan Phone Co	109 North Kickapoo Drive	4,714	$351,540
N	N	N	N	Y	Y	N	Y	Lipan Schools	211 North Kickapoo Drive	679,27	$7,569,700
N	N	N	N	Y	Y	Y	Y	Ball Fields	279 West Lipan Drive	163,350	$340,700
N	N	N	N	Y	Y	Y	Y	Ag Farm	108 Osage Street	448,96	$3,659,550

City of Tolar

Wildfire Ignitions, 2005-2015

Source: Texas A&M Forest Service

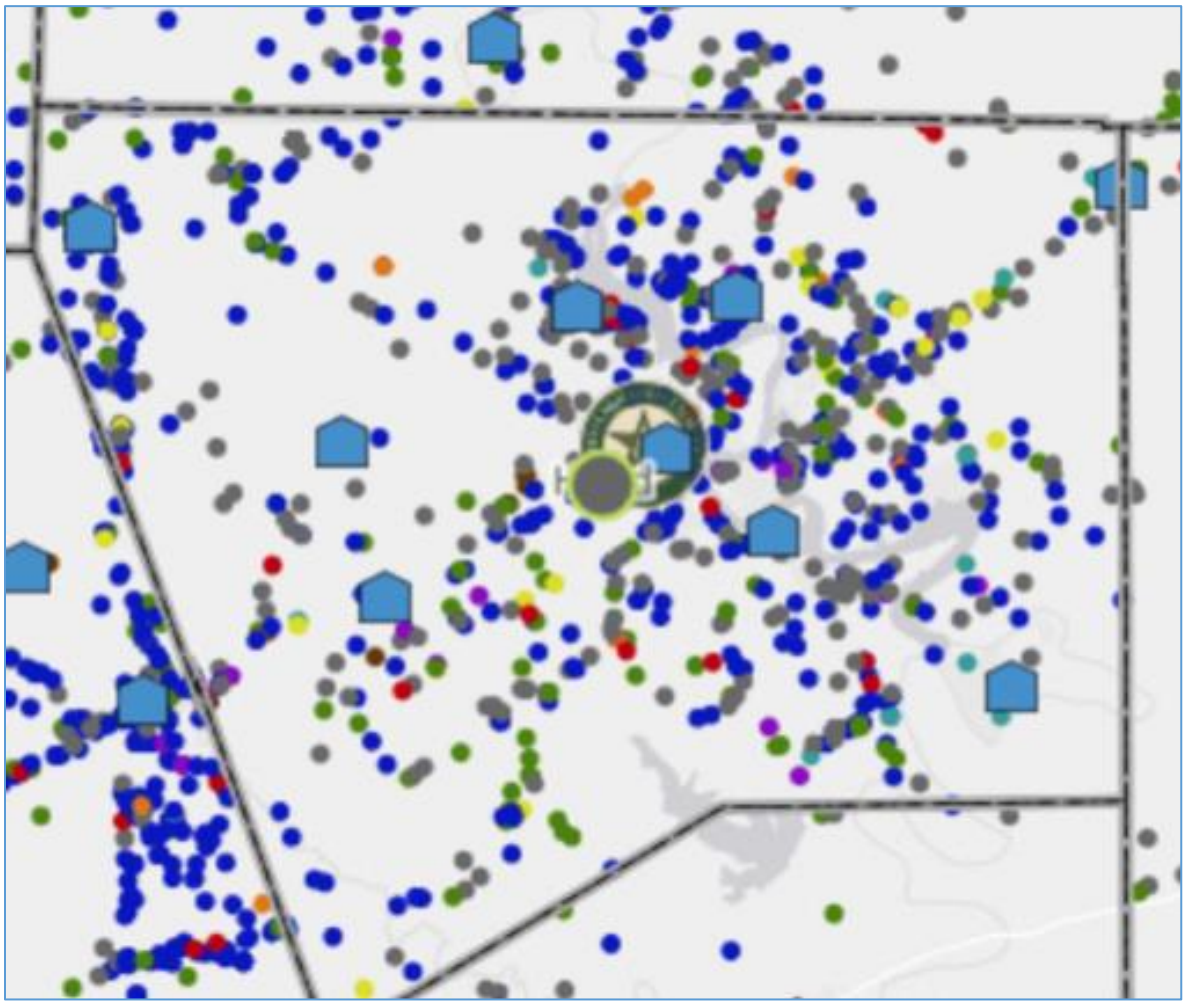
Tolar Critical and Vulnerable Facility & Infrastructure Table

At Risk To: (Y or N)								**Tolar Critical and Vulnerable Facility and Infrastructure Inventory**			
Drought	Expansive Soils	Extreme Heat	Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms	**Facility Name or Description**	**Address**	**Square Feet**	**Structure Value**
N	N	N	N	Y	Y	N	Y	Station 90 VFD	9003 West US Hwy 377	4,500	$301,170
N	N	N	N	Y	Y	N	Y	Tolar Small Steps Childcare	9010 West US 377	4,483	$159,700
N	N	N	N	Y	Y	N	Y	Little Rattlers Day Care Center	9015 East US Hwy 377	8,534	$702,220
N	N	N	N	Y	Y	Y	Y	Park Place RV Ranch	6300 US Hwy 377	34,470	$33,720
N	N	N	N	Y	Y	N	Y	City Hall	8712 West Hwy 377	2,915	$369,910
N	N	N	N	Y	Y	Y	Y	Dollar General	9150 West Hwy 377	9,505	$761,000
N	N	N	N	Y	Y	Y	Y	Daniel's Feed Store	6611 West Hwy 377	5,601	$192,260
N	N	N	N	Y	Y	N	Y	Texas Dept Public Safety	105 Pine Lane	875	$84,580
N	N	N	N	Y	Y	Y	Y	Waste Management Treatment	Unknown	Unknown	Unknown
N	N	N	N	Y	Y	Y	Y	Tolar High School	301 Rock Church Hwy	84,757	$9,950,2000
N	N	N	N	Y	Y	Y	Y	Tolar Elementary/Jr High School	300 Hill City Hwy	54,392	$6,177,770
N	N	N	N	Y	Y	Y	Y	Administration Building	401 East 7th St	63,346	$5,635,770
N	N	N	N	Y	Y	N	Y	First National Bank	8401 US 377	5,846	$684,820
N	N	N	N	Y	Y	Y	Y	Water Tower	Unknown	Unknown	Unknown

At Risk To: (Y or N)								**Tolar Critical and Vulnerable Facility and Infrastructure Inventory**			
Drought	Expansive Soils	Extreme Heat	Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms	**Facility Name or Description**	**Address**	**Square Feet**	**Structure Value**
N	N	N	N	Y	Y	N	Y	Post Office	9101 West US 377	5,408	$537,010
N	N	N	N	Y	Y	N	Y	J.D. Neely Community Center	120 Tolar Cemetery Road	5,000	Unknown
N	N	N	N	Y	Y	N	Y	Top Notch Books	8801 US 377	Unknown	Unknown
N	N	N	N	Y	Y	N	Y	Tolar Church of Christ	8604 US 377	12,966	$403,110
N	N	N	N	Y	Y	N	Y	Tolar Baptist Church	400 Tolar Hwy	12,959	$1,108,850
N	N	N	N	Y	Y	N	Y	Tolar Methodist Church	8812 US Hwy 377	4,428	$208,900
N	N	N	N	Y	Y	N	Y	Array and Display	8505 West US 377	2,506	$109,330

Hood County Unincorporated

Wildfire Ignitions, 2005-2015



Source: Texas A&M Forest Service

Hood County Unincorporated Critical and Vulnerable Facility & Infrastructure Table

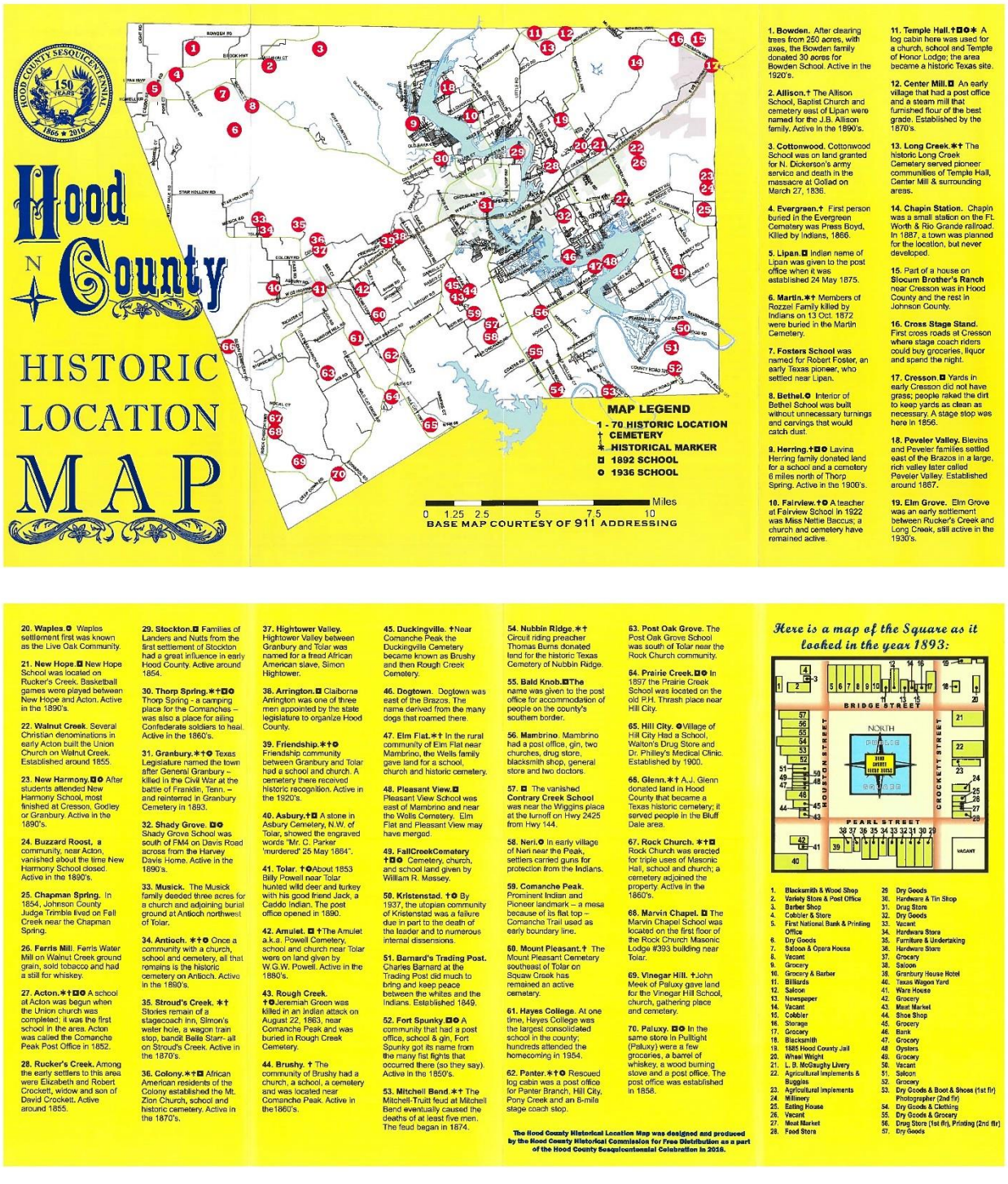
At Risk To: (Y or N)								**Hood County Unincorporated Critical and Vulnerable Facility and Infrastructure Inventory**			
Drought	Expansive Soils	Extreme Heat	Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms	**Facility Name or Description**	**Address**	**Square Feet**	**Structure Value**
N	N	N	N	Y	Y	N	Y	Station 20 VFD	3108 Sky Harbour Drive	4,376	$153,530
N	N	N	N	Y	Y	Y	Y	Station 40 VFD	6430 Smoky Hill Court	11,159	$1,156,510
N	N	N	N	Y	Y	N	Y	Station 50 VFD	1414 E Apache Trail	2,100	Unknown
N	N	N	N	Y	Y	N	Y	Station 70 VFD	3410 Hilltop Road	39,901	$132,320
N	N	N	N	Y	Y	N	Y	Station 80 VFD	9518 Monticello Drive	44,475	$715,820
N	N	N	N	Y	Y	Y	Y	Shell	2000 Weatherford Hwy	103,180	$548,590
N	N	N	N	Y	Y	Y	Y	Tommy's	3400 Mambrino Hwy	7,174	$410,090
N	N	N	N	Y	Y	Y	Y	Chevron (Wranglers)	2163 E US Hwy 377	25,875	$327,350
N	N	N	N	Y	Y	Y	Y	Conoco	3145 Fall Creek Hwy	14,331	$185,930
N	N	N	N	Y	Y	Y	Y	Tommy's	5285 E US Hwy 377	1,900	$148,010
N	N	N	N	Y	Y	Y	Y	Tommy's Food Store	3600 Contrary Creek Road	6,168	$215,310
N	N	N	N	Y	Y	Y	Y	Circle K	1901 E US Hwy 377	10,797	$390,650
N	N	N	N	Y	Y	Y	Y	Tommy's	7424 Fall Creek Hwy	32,757	$168,530
N	N	N	N	Y	Y	Y	Y	JJ's Fastop	902 US 377	3,334	$642,720
N	N	N	N	Y	Y	N	Y	David's	5210 Acton Hwy	53,375	$409,580

At Risk To: (Y or N)								Hood County Unincorporated Critical and Vulnerable Facility and Infrastructure Inventory			
Drought	Expansive Soils	Extreme Heat	Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms	**Facility Name or Description**	**Address**	**Square Feet**	**Structure Value**
N	N	N	N	Y	Y	N	Y	Pecan Foods	9201 Plantation Drive	133,381	$978,040
N	N	N	N	Y	Y	Y	Y	Hood County Brush Disposal	1514 Weatherford Hwy	685,678	$314,820
N	N	N	N	Y	Y	Y	Y	Hood County Citizens Collection Station	244 Bray Street	108,900	$54,450
N	N	N	N	Y	Y	N	Y	Pecan Valley Centers Granbury Clinic	104 Pirate Drive	15,038	$441,810
N	N	N	N	Y	Y	Y	Y	Acton Medical Clinic	2006 Fall Creek Hwy	6,628	$691,560
N	N	N	N	Y	Y	N	Y	Morgan Street Animal Hospital	1901 Morgan Street	4,158	$259,140
N	N	N	N	Y	Y	N	Y	Creations Child Care & Learning	3015 James Road	6,291	$294,400
N	N	N	N	Y	Y	N	Y	North Texas Christian Early Education Center	5340 Old Granbury Road	3,600	$181,180
N	N	N	N	Y	Y	Y	Y	The Learning Ladder	603 Meander Road	13,896	$343,760
N	N	N	N	Y	Y	Y	Y	Rainbows Promise	2727 Mambrino Hwy	8,880	$440,530

At Risk To: (Y or N)								**Hood County Unincorporated Critical and Vulnerable Facility and Infrastructure Inventory**			
Drought	Expansive Soils	Extreme Heat	Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms	**Facility Name or Description**	**Address**	**Square Feet**	**Structure Value**
N	N	N	N	Y	Y	N	Y	First Christian Church of Granbury	2109 W Hwy 377	4,439	$275,620
N	N	N	N	Y	Y	N	Y	Lake Granbury Christian Temple	3755 Acton Hwy	18,606	$1,854,770
N	N	N	N	Y	Y	N	Y	The Church of Jesus Christ of Latter-day Saints	1226 Ross Lane	15,381	$1,518,520
N	N	N	N	Y	Y	Y	Y	Lakeside Baptist Church	500 West Bluebonnet Drive	54,744	$8,887,590
N	N	N	N	Y	Y	N	Y	Seventh Day Adventist Church	2016 Acton Hwy	11,054	$1,147,390
N	N	N	N	Y	Y	Y	Y	First Baptist Church – Thorp Springs	2815 Lipan Hwy	7,918	$674,320
N	N	N	N	Y	Y	N	Y	Acton Methodist Church	3433 Fall Creek Hwy	76,400	$6,870,650
N	N	N	N	Y	Y	N	Y	Oak Trail Baptist Church	4501 Peppertree Road	14,045	$1,215,980
N	N	N	N	Y	Y	N	Y	Good Shepherd Anglican Church	3600 Fall Creek Hwy	2,596	$58,180
N	N	N	N	Y	Y	N	Y	Church at Granbury	4900 Fireside Court	14,863	$1,332,760

At Risk To: (Y or N)								Hood County Unincorporated Critical and Vulnerable Facility and Infrastructure Inventory			
Drought	Expansive Soils	Extreme Heat	Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms	**Facility Name or Description**	**Address**	**Square Feet**	**Structure Value**
N	N	N	N	Y	Y	Y	Y	Broken Spoke Texas	3827 Weatherford Hwy	130,680	$65,340
N	N	N	N	Y	Y	N	Y	Bennett's RV Ranch	3101 Old Granbury Road	198,067	$99,030
N	N	N	N	Y	Y	Y	Y	377 RV Park	4170 E US Hwy 377	193,406	$96,700
N	N	N	N	Y	Y	Y	Y	Thorp Spring RV Park	2700 N Lipan Drive	1,600	$46,280
N	N	N	N	Y	Y	Y	Y	Midway Pines RV Park	9322 Glen Rose Hwy	13,700	$472,080
N	N	N	N	Y	Y	N	Y	Granbury RV Resort	1800 Mambrino Hwy	Unknown	Unknown
N	N	N	N	Y	Y	Y	Y	Comanche Harbor Rec Center	3507 Tomahawk Drive	720	Unknown
N	N	N	N	Y	Y	N	Y	Western Hills Rec Center	514 Mountain View Trail	1,520	Unknown
N	N	N	N	Y	Y	Y	Y	Canyon Creek Rec Center	2300 Club Drive	2,766	Unknown
N	N	N	N	Y	Y	Y	Y	Whippoorwill Bay Rec Center	207 Skylark Drive	1,846	$55,970
N	N	N	N	Y	Y	N	Y	DCBE Rec Center	5301 Country Club Drive	Unknown	Unknown
N	N	N	N	Y	Y	N	Y	DCBE County Club	5301 Country Club Drive	Unknown	Unknown
N	N	N	N	Y	Y	N	Y	Pecan Plantation Country Club	8650 Westover Court	Unknown	Unknown

At Risk To: (Y or N)								Hood County Unincorporated Critical and Vulnerable Facility and Infrastructure Inventory			
Drought	Expansive Soils	Extreme Heat	Flooding	Thunderstorms	Tornadoes	Wildfires	Winter Storms	**Facility Name or Description**	**Address**	**Square Feet**	**Structure Value**
N	N	N	N	Y	Y	Y	Y	Camp Crucis	2875 Camp Crucis Court	39,952	Unknown
N	N	N	N	Y	Y	Y	Y	Rancho Brazos Community Center	3701 Sundown Trail	Unknown	Unknown
N	N	N	N	Y	Y	Y	Y	Acton Elementary School	3200 Acton School Road	487,872	$9,549,740
N	N	N	N	Y	Y	Y	Y	Mambrino School	3835 Mambrino Hwy	871,200	$21,998,510
N	N	N	N	Y	Y	Y	Y	Acton Middle School	1300 James Road	3,482,186	$21,958,540
N	N	N	N	Y	Y	Y	Y	Cornerstone Christian Academy	5150 North Gate Road	217,800	$1,511,850
N	N	N	N	Y	Y	Y	Y	Pecan Plantation Airport	9600 Airpark Drive	1,576,828	$788,414
N	N	N	N	Y	Y	Y	Y	Nassau Bay Airport	4252 Rhea Road	4,284	$150,180
N	N	N	N	Y	Y	N	Y	Pecan Plantation EMS	9518 Monticello Drive	7,084	Unknown
N	N	N	N	Y	Y	N	Y	Pecan Strip Center	Plantation Drive	94,395	$582,700
N	N	N	N	Y	Y	Y	Y	Hood County Jail	400 Deputy Larry Miller Drive	45,739	$6,960,190



Source: [Hood County Historical Commission]

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Appendix B: Capabilities Assessment

The following capability assessments examine the ability of the jurisdictions to implement and manage a comprehensive mitigation strategy. Strengths, weaknesses, and resources of the jurisdictions are identified as a means to develop an effective Hazard Mitigation Action Plan (HazMAP). The capabilities identified in these assessments were evaluated collectively to develop feasible recommendations, which support the implementation of effective mitigation activities.

The assessments include questions regarding existing plans, policies, and regulations that contribute to or hinder the ability to implement hazard mitigation activities, including legal and regulatory capabilities; administrative and technical capabilities; and fiscal capabilities.

City of Cresson

Planning and Regulatory Assessment

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of natural hazards.

Type of Plans	Have capability?	Level	If Yes…		
Comprehensive or Master Plan	☒Yes ☐No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Capital Improvement Plan (CIP)	☐Yes ☒No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**

Type of Plans	Have capability?	Level	If Yes…		
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Economic Development Plan	☐Yes ☒No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Local Emergency Operations Plan	☒Yes ☐No ☐N/A	☐ Local ☒ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Continuity of Operations Plan	☒Yes ☐No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**

Type of Plans	Have capability?	Level	If Yes…		
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Transportation Plan	☐Yes ☒No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Stormwater Management Plan	☐Yes ☒No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Community Wildfire Protection Plan	☐Yes ☒No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**

Type of Plans	Have capability?	Level	If Yes…		
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Green Infrastructure Plan	☐Yes ☒No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Parks or Open Space Plan	☒Yes ☐No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Hazard Mitigation Plan	☒Yes ☐No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☒Yes ☐No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☒Yes ☐No	**Comments:**

Type of Plans	Have capability?	Level	If Yes…		
			Can the plan be used to implement mitigation actions?	☒Yes ☐No	**Comments:**

Land Use Planning and Ordinances	Have capability?	If Yes…		
Zoning Ordinance	☒Yes ☐No ☐N/A	**Is the ordinance an effective measure for reducing hazard impacts?**	☐Yes ☒No	**Comments:**
		Is the ordinance adequately administered and enforced?	☒Yes ☐No	**Comments:**
Subdivision Ordinance	☒Yes ☐No ☐N/A	**Is the ordinance an effective measure for reducing hazard impacts?**	☐Yes ☒No	**Comments:**
		Is the ordinance adequately administered and enforced?	☒Yes ☐No	**Comments:**
Floodplain Ordinance	☒Yes ☐No ☐N/A	**Is the ordinance an effective measure for reducing hazard impacts?**	☒Yes ☐No	**Comments:**
		Is the ordinance adequately administered and enforced?	☒Yes ☐No	**Comments:**
Flood Insurance Rate Maps (FIRM)	☒Yes ☐No ☐N/A	**Is the FIRM an effective measure for reducing hazard impacts?**	☒Yes ☐No	**Comments:**
		Is the FIRM adequately	☐Yes	**Comments:**

Land Use Planning and Ordinances	Have capability?	If Yes…		
		administered and enforced?	☒No	
Natural Hazard Specific Ordinance (e.g., stormwater, wildfire)	☐Yes ☒No ☐N/A	**Is the ordinance an effective measure for reducing hazard impacts?**	☐Yes ☒No	**Comments:**
		Is the ordinance adequately administered and enforced?	☐Yes ☒No	**Comments:**
Acquisition of land for open space and public recreation uses	☒Yes ☐No ☐N/A	**Is the ordinance an effective measure for reducing hazard impacts?**	☐Yes ☒No	**Comments:**
		Is the ordinance adequately administered and enforced?	☐Yes ☒No	**Comments:**

Building Code, Permitting, and Inspections	Have capability?	
Building Code	☒Yes ☐No ☐N/A	**Version/Year:** IBC 2012
Building Code Effectiveness Grading Schedule (BGEGS) Score	☐Yes ☒No ☐N/A	**Score:**
Fire Department ISO Rating	☒Yes ☐No ☐N/A	**Rating:** 3
Site Plan Review Requirements	☒Yes ☐No ☐N/A	**Review method:** Site plans with City Building Inspector

Administrative and Technical Assessment

Administrative and technical capabilities include staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions.

Administration	Have capability?	If Yes…
Planning Commission	☐Yes ☒No ☐N/A	**Describe capability:**
Mitigation Planning Committee	☒Yes	**Describe capability:** Identifies hazards, conducts a risk and vulnerability assessment, and creates and monitors mitigation actions.
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	☐Yes ☒No ☐N/A	**Describe capability:**
Mutual Aid Agreements	☒Yes ☐No ☐N/A	**Describe capability:** Fire Department

Staff	Have capability? FT/PT*	If Yes…	
***Full-time (FT) or part-time (PT) position**			
Chief Building Official	☐Yes-FT ☒Yes- PT ☐No ☐N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐No
		Is staff trained on natural hazards and mitigation?	☐ Yes ☒No
Floodplain Administrator	☒Yes-FT ☐Yes- PT ☐No ☐N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐No

Staff	Have capability? FT/PT*	If Yes…	
***Full-time (FT) or part-time (PT) position**			
Emergency Manager	☒Yes-FT ☐Yes- PT ☐No ☐N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐No
Community Planner	☒Yes-FT ☐Yes- PT ☐No ☐N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐No
Civil Engineer	☐Yes-FT ☒Yes- PT ☐No ☐N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐No
GIS Coordinator	☒Yes-FT ☐Yes- PT ☐No ☐N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐No
Public Works Director	☒Yes-FT ☐Yes- PT ☐No ☐N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐No

Staff	Have capability? FT/PT*	If Yes…	
***Full-time (FT) or part-time (PT) position**			
Fire Chief	☐ Yes-FT ☒ Yes- PT ☐ No ☐ N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐ No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐ No
Environmental Director	☐ Yes-FT ☒ Yes- PT ☐ No ☐ N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐ No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐ No

Technical	Have capability?	If Yes…	
Warning Systems/Services (e.g., Reverse 911, outdoor warning signals)	☒ Yes ☐ No ☐ N/A	**Describe capability:** Blackboard, CodeRed	
		Has capability been used to assess or mitigate risk in the past?	☒ Yes ☐ No
		If yes, for what type of event? Storm notification	
Hazard data and information	☐ Yes ☒ No ☐ N/A	**Describe capability:**	
		Has capability been used to assess or mitigate risk in the past?	☐ Yes ☒ No
		If yes, for what type of event?	

Technical	Have capability?	If Yes…	
Grant writing	☒Yes ☐No ☐N/A	**Describe capability:** Part-time Grant Writer	
		Has capability been used to assess or mitigate risk in the past?	☐ Yes ☒ No
		If yes, for what type of event?	
HaZUS analysis or GIS software	☐Yes ☒No ☐N/A	**Describe capability:**	
		Has capability been used to assess or mitigate risk in the past?	☐ Yes ☒ No
		If yes, for what type of event?	

Education and Outreach Assessment

Education and outreach programs and methods can be used to implement mitigation activities and communicate hazard-related information.

Program or Organization	Have capability?	If Yes…	
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	☒Yes ☐No ☐N/A	**Could the program or organization help implement future mitigation activities?**	☒ Yes ☐ No
		Describe program or organization and how it relates to disaster resilience and mitigation: CERT	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	☒Yes ☐No ☐N/A	**Could the program or organization help implement future mitigation activities?**	☒ Yes ☐ No
		Describe program or organization and how it relates to disaster resilience and mitigation: Blackboard notifications	

Program or Organization	Have capability?	If Yes…	
Natural disaster or safety related school programs	☐Yes ☐No ☒N/A	**Could the program or organization help implement future mitigation activities?**	☐ Yes ☐ No
		Describe program or organization and how it relates to disaster resilience and mitigation:	
Public/private partnership initiatives addressing disaster-related issues	☒Yes ☐No ☐N/A	**Could the program or organization help implement future mitigation activities?**	☒ Yes ☐ No
		Describe program or organization and how it relates to disaster resilience and mitigation: CERT	
StormReady certification	☐Yes ☒No ☐N/A		
Firewise Communities Certification	☐Yes ☒No ☐N/A		

Financial Assessment

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resources	Have capability?	If Yes…	
Capital Improvements Project funding	☐Yes ☒No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☐ Yes ☒No
		Has the funding resource been used in past?	☐ Yes ☒No
		If yes, for what type of mitigation activities?	

Funding Resources	Have capability?	If Yes…	
Authority to levy taxes for specific purposes	☒Yes ☐No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☐ Yes ☒No
		Has the funding resource been used in past?	☐ Yes ☒No
		If yes, for what type of mitigation activities?	
Fees for water, sewer, gas, and/or electric services	☒Yes ☐No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐No
		Has the funding resource been used in past?	☐ Yes ☒No
		If yes, for what type of mitigation activities?	
Impact fees for new development	☐Yes ☒No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☐ Yes ☒No
		Has the funding resource been used in past?	☐ Yes ☒No
		If yes, for what type of mitigation activities?	
Stormwater utility fee	☐Yes ☒No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☐ Yes ☒No
		Has the funding resource been used in past?	☐ Yes ☒No
		If yes, for what type of mitigation activities?	
Incurrence of debt through general obligation	☐Yes ☒No	**Could the resource be used to fund future mitigation actions?**	☐ Yes ☒No

Funding Resources	Have capability?	If Yes…	
bonds and/or special tax bonds	☐N/A	**Has the funding resource been used in past?**	☐ Yes ☒No
		If yes, for what type of mitigation activities?	
Incur debt through private activities	☒Yes ☐No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐No
		Has the funding resource been used in past?	☐ Yes ☒No
		If yes, for what type of mitigation activities?	
Community Development Block Grant	☒Yes ☐No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐No
		Has the funding resource been used in past?	☒ Yes ☐No
		If yes, for what type of mitigation activities?	
Other federal funding programs (e.g. FEMA mitigation grants)	☐Yes ☒No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐No
		Has the funding resource been used in past?	☐ Yes ☒No
		If yes, for what type of mitigation activities?	
State funding programs	☒Yes ☐No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐No
		Has the funding resource been used in past?	☐ Yes ☒No
		If yes, for what type of mitigation activities?	

How can these capabilities be expanded and improved to reduce risk?
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.

City of Granbury

Planning and Regulatory Assessment

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of natural hazards.

Type of Plans	Have capability?	Level	If Yes…		
Comprehensive or Master Plan	☒Yes ☐No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Capital Improvement Plan (CIP)	☒Yes ☐No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement	☐Yes ☒No	**Comments:**

Type of Plans	Have capability?	Level	If Yes…		
			mitigation actions?		
Economic Development Plan	☐Yes ☒No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Local Emergency Operations Plan	☒Yes ☐No ☐N/A	☐ Local ☒ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Continuity of Operations Plan	☒Yes ☐No ☐N/A	☐ Local ☒ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement	☐Yes ☒No	**Comments:**

Type of Plans	Have capability?	Level	If Yes…		
			mitigation actions?		
Transportation Plan	☐Yes ☒No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Stormwater Management Plan	☐Yes ☒No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Community Wildfire Protection Plan	☐Yes ☒No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement	☐Yes ☒No	**Comments:**

Type of Plans	Have capability?	Level	If Yes…		
			mitigation actions?		
Green Infrastructure Plan	☐Yes ☒No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Parks or Open Space Plan	☒Yes ☐No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Hazard Mitigation Plan	☒Yes ☐No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☒Yes ☐No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☒Yes ☐No	**Comments:**
			Can the plan be used to implement	☒Yes ☐No	**Comments:**

Type of Plans	Have capability?	Level	If Yes…		
			mitigation actions?		

Land Use Planning and Ordinances	Have capability?	If Yes…		
Zoning Ordinance	☒Yes ☐No ☐N/A	**Is the ordinance an effective measure for reducing hazard impacts?**	☒Yes ☐No	**Comments:**
		Is the ordinance adequately administered and enforced?	☒Yes ☐No	**Comments:**
Subdivision Ordinance	☒Yes ☐No ☐N/A	**Is the ordinance an effective measure for reducing hazard impacts?**	☒Yes ☐No	**Comments:**
		Is the ordinance adequately administered and enforced?	☒Yes ☐No	**Comments:**
Floodplain Ordinance	☒Yes ☐No ☐N/A	**Is the ordinance an effective measure for reducing hazard impacts?**	☒Yes ☐No	**Comments:**
		Is the ordinance adequately administered and enforced?	☒Yes ☐No	**Comments:**
Flood Insurance Rate Maps (FIRM)	☒Yes ☐No ☐N/A	**Is the FIRM an effective measure for reducing hazard impacts?**	☒Yes ☐No	**Comments:**
		Is the FIRM adequately administered and enforced?	☒Yes ☐No	**Comments:**

Land Use Planning and Ordinances	Have capability?	If Yes…		
Natural Hazard Specific Ordinance (e.g., stormwater, wildfire)	☐Yes ☒No ☐N/A	**Is the ordinance an effective measure for reducing hazard impacts?**	☐Yes ☒No	**Comments:**
		Is the ordinance adequately administered and enforced?	☐Yes ☒No	**Comments:**
Acquisition of land for open space and public recreation uses	☒Yes ☐No ☐N/A	**Is the ordinance an effective measure for reducing hazard impacts?**	☒Yes ☐No	**Comments:**
		Is the ordinance adequately administered and enforced?	☒Yes ☐No	**Comments:**

Building Code, Permitting, and Inspections	Have capability?	
Building Code	☒Yes ☐No ☐N/A	**Version/Year:** IBC 2015
Building Code Effectiveness Grading Schedule (BGEGS) Score	☐Yes ☒No ☐N/A	**Score:**
Fire Department ISO Rating	☒Yes ☐No ☐N/A	**Rating:** 3
Site Plan Review Requirements	☒Yes ☐No ☐N/A	**Review method:** Development review committee of staff

Administrative and Technical Assessment

Administrative and technical capabilities include staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions.

Administration	Have capability?	If Yes…
Planning Commission	☒Yes ☐No ☐N/A	**Describe capability:** Provided by state law
Mitigation Planning Committee	☒Yes	**Describe capability:** Identifies hazards, conducts a risk and vulnerability assessment, and creates and monitors mitigation actions.
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	☒Yes ☐No ☐N/A	**Describe capability:** tree trimming
Mutual Aid Agreements	☒Yes ☐No ☐N/A	**Describe capability:** Fire, Law Enforcement, Dispatch

Staff	Have capability? FT/PT*	If Yes…	
***Full-time (FT) or part-time (PT) position**			
Chief Building Official	☒Yes-FT ☐Yes- PT ☐No ☐N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐No
		Is staff trained on natural hazards and mitigation?	☐ Yes ☒No
Floodplain Administrator	☐Yes-FT ☒Yes- PT ☐No ☐N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐No

Staff	Have capability? FT/PT*	If Yes…	
***Full-time (FT) or part-time (PT) position**			
Emergency Manager	☒Yes-FT ☐Yes- PT ☐No ☐N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐No
Community Planner	☒Yes-FT ☐Yes- PT ☐No ☐N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐No
Civil Engineer	☒Yes-FT ☐Yes- PT ☐No ☐N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐No
GIS Coordinator	☐Yes-FT ☒Yes- PT ☐No ☐N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐No
Public Works Director	☒Yes-FT ☐Yes- PT ☐No ☐N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐No

Staff	Have capability? FT/PT*	If Yes…	
***Full-time (FT) or part-time (PT) position**			
Fire Chief	☐ Yes-FT ☒ Yes- PT ☐ No ☐ N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐ No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐ No
Environmental Director	☐ Yes-FT ☐ Yes- PT ☒ No ☐ N/A	**Is staffing adequate to enforce regulations?**	☐ Yes ☒ No
		Is staff trained on natural hazards and mitigation?	☐ Yes ☒ No

Technical	Have capability?	If Yes…	
Warning Systems/Services (e.g., Reverse 911, outdoor warning signals)	☒ Yes ☐ No ☐ N/A	**Describe capability.** CodeRed	
		Has capability been used to assess or mitigate risk in the past?	☒ Yes ☐ No
		If yes, for what type of event?	
Hazard data and information	☒ Yes ☐ No ☐ N/A	**Describe capability:** Tier 2 reports	
		Has capability been used to assess or mitigate risk in the past?	☒ Yes ☐ No
		If yes, for what type of event? Chlorine leak	

Technical	Have capability?	If Yes…	
Grant writing	☒Yes ☐No ☐N/A	**Describe capability.** Consultant	
		Has capability been used to assess or mitigate risk in the past?	☒ Yes ☐ No
		If yes, for what type of event? Streets, lift station, economic development	
HaZUS analysis or GIS software	☒Yes ☐No ☐N/A	**Describe capability:** Unknown	
		Has capability been used to assess or mitigate risk in the past?	☐ Yes ☒ No
		If yes, for what type of event?	

Education and Outreach Assessment

Education and outreach programs and methods can be used to implement mitigation activities and communicate hazard-related information.

Program or Organization	Have capability?	If Yes…	
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	☒Yes ☐No ☐N/A	**Could the program or organization help implement future mitigation activities?**	☒ Yes ☐ No
		Describe program or organization and how it relates to disaster resilience and mitigation: Citizens on Patrol program	
Ongoing public education or information program (e.g., responsible water use, fire safety, household	☒Yes ☐No ☐N/A	**Could the program or organization help implement future mitigation activities?**	☒ Yes ☐ No

Program or Organization	Have capability?	If Yes…	
preparedness, environmental education)		**Describe program or organization and how it relates to disaster resilience and mitigation:** Fire, water, household preparedness	
Natural disaster or safety related school programs	☒Yes ☐No ☐N/A	**Could the program or organization help implement future mitigation activities?**	☒ Yes ☐ No
		Describe program or organization and how it relates to disaster resilience and mitigation: Active shooter training	
Public/private partnership initiatives addressing disaster-related issues	☐Yes ☒No ☐N/A	**Could the program or organization help implement future mitigation activities?**	☐ Yes ☒ No
		Describe program or organization and how it relates to disaster resilience and mitigation:	
StormReady certification	☐Yes ☒No ☐N/A		
Firewise Communities Certification	☐Yes ☒No ☐N/A		

Financial Assessment

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resources	Have capability?	If Yes…	
Capital Improvements Project funding	☒Yes ☐No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐ No

Funding Resources	Have capability?	If Yes…	
		Has the funding resource been used in past?	☒ Yes ☐ No
		If yes, for what type of mitigation activities? Water system, development codes for building	
Authority to levy taxes for specific purposes	☒Yes ☐No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	
Fees for water, sewer, gas, and/or electric services	☒Yes ☐No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities? Equipment upgrades	
Impact fees for new development	☒Yes ☐No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	

Funding Resources	Have capability?	If Yes…	
Stormwater utility fee	☐Yes ☒No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☐ Yes ☒ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	
Incurrence of debt through general obligation bonds and/or special tax bonds	☒Yes ☐No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	
Incur debt through private activities	☐Yes ☐No ☒N/A	**Could the resource be used to fund future mitigation actions?**	☐ Yes ☒ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	
Community Development Block Grant	☒Yes ☐No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐ No
		Has the funding resource been used in past?	☐ Yes

Funding Resources	Have capability?	If Yes…	
			☒ No
		If yes, for what type of mitigation activities?	
Other federal funding programs (e.g. FEMA mitigation grants)	☒Yes ☐No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐ No
		Has the funding resource been used in past?	☒ Yes ☐ No
		If yes, for what type of mitigation activities?	
State funding programs	☒Yes ☐No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	

How can these capabilities be expanded and improved to reduce risk?
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.

City of Lipan

Planning and Regulatory Assessment

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of natural hazards.

Type of Plans	Have capability?	Level	If Yes…		
Comprehensive or Master Plan	☐Yes ☒No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Capital Improvement Plan (CIP)	☒Yes ☐No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☒Yes ☐No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☒Yes ☐No	**Comments:**
			Can the plan be used to implement mitigation actions?	☒Yes ☐No	**Comments:**
Economic Development Plan	☐Yes ☒No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**

Type of Plans	Have capability?	Level	If Yes…		
Local Emergency Operations Plan	☒Yes ☐No ☐N/A	☐ Local ☒ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Continuity of Operations Plan	☐Yes ☒No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Transportation Plan	☐Yes ☒No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**

Type of Plans	Have capability?	Level	If Yes…		
Stormwater Management Plan	☒Yes ☐No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☒Yes ☐No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☒Yes ☐No	**Comments:**
			Can the plan be used to implement mitigation actions?	☒Yes ☐No	**Comments:**
Community Wildfire Protection Plan	☐Yes ☒No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Green Infrastructure Plan	☐Yes ☒No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**

Type of Plans	Have capability?	Level	If Yes…		
Parks or Open Space Plan	☒Yes ☐No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Hazard Mitigation Plan	☐Yes ☒No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**

Land Use Planning and Ordinances	Have capability?	If Yes…		
Zoning Ordinance	☐Yes ☒No ☐N/A	**Is the ordinance an effective measure for reducing hazard impacts?**	☐Yes ☒No	**Comments:**
		Is the ordinance adequately administered and enforced?	☒Yes ☐No	**Comments:**

Land Use Planning and Ordinances	Have capability?	If Yes…		
Subdivision Ordinance	☒Yes ☐No ☐N/A	**Is the ordinance an effective measure for reducing hazard impacts?**	☒Yes ☐No	**Comments:**
		Is the ordinance adequately administered and enforced?	☒Yes ☐No	**Comments:**
Floodplain Ordinance	☒Yes ☐No ☐N/A	**Is the ordinance an effective measure for reducing hazard impacts?**	☒Yes ☐No	**Comments:**
		Is the ordinance adequately administered and enforced?	☒Yes ☐No	**Comments:**
Flood Insurance Rate Maps (FIRM)	☒Yes ☐No ☐N/A	**Is the FIRM an effective measure for reducing hazard impacts?**	☐Yes ☒No	**Comments:**
		Is the FIRM adequately administered and enforced?	☐Yes ☒No	**Comments:**
Natural Hazard Specific Ordinance (e.g., stormwater, wildfire)	☐Yes ☒No ☐N/A	**Is the ordinance an effective measure for reducing hazard impacts?**	☐Yes ☒No	**Comments:**
		Is the ordinance adequately administered and enforced?	☐Yes ☒No	**Comments:**
Acquisition of land for open space and public recreation uses	☒Yes ☐No ☐N/A	**Is the ordinance an effective measure for reducing hazard impacts?**	☐Yes ☒No	**Comments:**
		Is the ordinance adequately	☐Yes ☒No	**Comments:**

Land Use Planning and Ordinances	Have capability?	If Yes…		
		administered and enforced?		

Building Code, Permitting, and Inspections	Have capability?	
Building Code	☒Yes ☐No ☐N/A	**Version/Year:**
Building Code Effectiveness Grading Schedule (BGEGS) Score	☐Yes ☒No ☐N/A	**Score:**
Fire Department ISO Rating	☒Yes ☐No ☐N/A	**Rating:** 4
Site Plan Review Requirements	☒Yes ☐No ☐N/A	**Review method:** site plans With city building inspector

Administrative and Technical Assessment

Administrative and technical capabilities include staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions.

Administration	Have capability?	If Yes…
Planning Commission	☐Yes ☒No ☐N/A	**Describe capability:**
Mitigation Planning Committee	☒Yes	**Describe capability:** Identifies hazards, conducts a risk and vulnerability assessment, and creates and monitors mitigation actions.
Maintenance programs to reduce risk (e.g., tree	☒Yes	**Describe capability:**

trimming, clearing drainage systems)	☐No ☐N/A	
Mutual Aid Agreements	☐Yes ☒No ☐N/A	**Describe capability:**

Staff	**Have capability? FT/PT***	**If Yes…**	
***Full-time (FT) or part-time (PT) position**			
Chief Building Official	☐Yes-FT ☐Yes- PT ☒No ☐N/A	**Is staffing adequate to enforce regulations?**	☐ Yes ☒No
		Is staff trained on natural hazards and mitigation?	☐ Yes ☒No
Floodplain Administrator	☐Yes-FT ☒Yes- PT ☐No ☐N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐No
Emergency Manager	☐Yes-FT ☒Yes- PT ☐No ☐N/A	**Is staffing adequate to enforce regulations?**	☐ Yes ☒No
		Is staff trained on natural hazards and mitigation?	☐ Yes ☒No
Community Planner	☐Yes-FT ☐Yes- PT ☒No ☐N/A	**Is staffing adequate to enforce regulations?**	☐ Yes ☒No
		Is staff trained on natural hazards and mitigation?	☐ Yes

Staff	Have capability? FT/PT*	If Yes…	
***Full-time (FT) or part-time (PT) position**			
			☒No
Civil Engineer	☐Yes-FT ☒Yes- PT ☐No ☐N/A	**Is staffing adequate to enforce regulations?**	☐ Yes ☐No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐No
GIS Coordinator	☒Yes-FT ☐Yes- PT ☐No ☐N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐No
Public Works Director	☒Yes-FT ☐Yes- PT ☐No ☐N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐No
		Is staff trained on natural hazards and mitigation?	☐ Yes ☒No
Fire Chief	☐Yes-FT ☒Yes- PT ☐No ☐N/A	**Is staffing adequate to enforce regulations?**	☐ Yes ☒No
		Is staff trained on natural hazards and mitigation?	☐ Yes ☒No
Environmental Director	☐Yes-FT ☐Yes- PT	**Is staffing adequate to enforce regulations?**	☐ Yes ☒No

Staff	Have capability? FT/PT*	If Yes…	
***Full-time (FT) or part-time (PT) position**			
	☒No ☐N/A	**Is staff trained on natural hazards and mitigation?**	☐ Yes ☒No

Technical	Have capability?	If Yes…	
Warning Systems/Services (e.g., Reverse 911, outdoor warning signals)	☒Yes ☐No ☐N/A	**Describe capability. Code Red**	
		Has capability been used to assess or mitigate risk in the past?	☒ Yes ☐ No
		If yes, for what type of event? Storm notification	
Hazard data and information	☒Yes ☐No ☐N/A	**Describe capability: TEIR II REPORTS**	
		Has capability been used to assess or mitigate risk in the past?	☒ Yes ☐ No
		If yes, for what type of event? CHLORINE LEAK	
Grant writing	☒Yes ☐No ☐N/A	**Describe capability. Part Time Grant Writer**	
		Has capability been used to assess or mitigate risk in the past?	☐ Yes ☒ No
		If yes, for what type of event?	
HaZUS analysis or GIS software	☐Yes	**Describe capability:**	

Technical	Have capability?	If Yes…	
	☒No ☐N/A	**Has capability been used to assess or mitigate risk in the past?**	☐ Yes ☒ No
		If yes, for what type of event?	

Education and Outreach Assessment

Education and outreach programs and methods can be used to implement mitigation activities and communicate hazard-related information.

Program or Organization	Have capability?	If Yes…	
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	☐Yes ☒No ☐N/A	**Could the program or organization help implement future mitigation activities?**	☐ Yes ☒ No
		Describe program or organization and how it relates to disaster resilience and mitigation:	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	☒Yes ☐No ☐N/A	**Could the program or organization help implement future mitigation activities?**	☒ Yes ☐ No
		Describe program or organization and how it relates to disaster resilience and mitigation: VDF, WATER BILL NOITICES	
Natural disaster or safety related school programs	☐Yes ☒No ☐N/A	**Could the program or organization help implement future mitigation activities?**	☐ Yes ☒ No
		Describe program or organization and how it relates to disaster resilience and mitigation:	
	☒Yes	**Could the program or organization help implement future mitigation activities?**	☒ Yes

Program or Organization	Have capability?	If Yes…	
Public/private partnership initiatives addressing disaster-related issues	☐No ☐N/A		☐ No
		Describe program or organization and how it relates to disaster resilience and mitigation: VFD	
StormReady certification	☐Yes ☒No ☐N/A		
Firewise Communities Certification	☐Yes ☒No ☐N/A		

Financial Assessment

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resources	Have capability?	If Yes…	
Capital Improvements Project funding	☒Yes ☐No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	
Authority to levy taxes for specific purposes	☒Yes ☐No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐ No
		Has the funding resource been used in past?	☐ Yes

Funding Resources	Have capability?	If Yes…	
			☒ No
		If yes, for what type of mitigation activities?	
Fees for water, sewer, gas, and/or electric services	☒Yes ☐No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐ No
		Has the funding resource been used in past?	☒ Yes ☐ No
		If yes, for what type of mitigation activities? EQUIPMET UPGRADES	
Impact fees for new development	☐Yes ☒No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☐ Yes ☒ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	
Stormwater utility fee	☐Yes ☒No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☐ Yes ☒ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	
Incurrence of debt through general obligation bonds and/or special tax bonds	☒Yes ☐No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐ No

Funding Resources	Have capability?	If Yes…	
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	
Incur debt through private activities	☐ Yes ☒ No ☐ N/A	**Could the resource be used to fund future mitigation actions?**	☐ Yes ☒ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	
Community Development Block Grant	☒ Yes ☐ No ☐ N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	
Other federal funding programs (e.g. FEMA mitigation grants)	☐ Yes ☒ No ☐ N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	
State funding programs	☒ Yes	**Could the resource be used to fund future mitigation actions?**	☒ Yes

Funding Resources	Have capability?	If Yes…	
	☐ No ☐ N/A		☐ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	

How can these capabilities be expanded and improved to reduce risk?
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.

City of Tolar

Planning and Regulatory Assessment

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of natural hazards.

Type of Plans	Have capability?	Level	If Yes…		
Comprehensive or Master Plan	☒ Yes ☐ No ☐ N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐ Yes ☒ No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐ Yes ☒ No	**Comments:**
			Can the plan be used to implement mitigation actions?	☒ Yes ☐ No	**Comments:**

Type of Plans	Have capability?	Level	If Yes…		
Capital Improvement Plan (CIP)	☒Yes ☐No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☒Yes ☐No	**Comments:**
Economic Development Plan	☒Yes ☐No ☐N/A	☒ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Local Emergency Operations Plan	☒Yes ☐No ☐N/A	☐ Local ☒ County ☐ Region	**Does the plan address natural hazards?**	☒Yes ☐No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**

Type of Plans	Have capability?	Level	If Yes…		
Continuity of Operations Plan	☐Yes ☒No ☐N/A	☐ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☐No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☐No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☐No	**Comments:**
Transportation Plan	☒Yes ☐No ☐N/A	☐ Local ☒ County ☐ Region	**Does the plan address natural hazards?**	☒Yes ☐No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Stormwater Management Plan	☐Yes ☒No ☐N/A	☐ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☐No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☐No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☐No	**Comments:**

Type of Plans	Have capability?	Level	If Yes…		
Community Wildfire Protection Plan	☒ Yes ☐ No ☐ N/A	☐ Local ☒ County ☐ Region	**Does the plan address natural hazards?**	☒ Yes ☐ No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐ Yes ☒ No	**Comments:**
			Can the plan be used to implement mitigation actions?	☒ Yes ☐ No	**Comments:**
Green Infrastructure Plan	☐ Yes ☒ No ☐ N/A	☐ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐ Yes ☐ No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐ Yes ☐ No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐ Yes ☐ No	**Comments:**
Parks or Open Space Plan	☐ Yes ☒ No ☐ N/A	☐ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐ Yes ☐ No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐ Yes ☐ No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐ Yes ☐ No	**Comments:**

Type of Plans	Have capability?	Level	If Yes…		
Hazard Mitigation Plan	☐Yes ☒No ☐N/A	☐ Local ☐ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☐No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☐No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☐No	**Comments:**

Land Use Planning and Ordinances	Have capability?	If Yes…		
Zoning Ordinance	☒Yes ☐No ☐N/A	**Is the ordinance an effective measure for reducing hazard impacts?**	☒Yes ☐No	**Comments:**
		Is the ordinance adequately administered and enforced?	☒Yes ☐No	**Comments:**
Subdivision Ordinance	☒Yes ☐No ☐N/A	**Is the ordinance an effective measure for reducing hazard impacts?**	☒Yes ☐No	**Comments:**
		Is the ordinance adequately administered and enforced?	☒Yes ☐No	**Comments:**
Floodplain Ordinance	☒Yes ☐No ☐N/A	**Is the ordinance an effective measure for reducing hazard impacts?**	☒Yes ☐No	**Comments:**
		Is the ordinance adequately	☒Yes	**Comments:**

Land Use Planning and Ordinances	Have capability?	If Yes…		
		administered and enforced?	☐ No	
Flood Insurance Rate Maps (FIRM)	☒ Yes ☐ No ☐ N/A	**Is the FIRM an effective measure for reducing hazard impacts?**	☒ Yes ☐ No	**Comments:**
		Is the FIRM adequately administered and enforced?	☒ Yes ☐ No	**Comments:**
Natural Hazard Specific Ordinance (e.g., stormwater, wildfire)	☐ Yes ☒ No ☐ N/A	**Is the ordinance an effective measure for reducing hazard impacts?**	☐ Yes ☐ No	**Comments:**
		Is the ordinance adequately administered and enforced?	☐ Yes ☐ No	**Comments:**
Acquisition of land for open space and public recreation uses	☐ Yes ☒ No ☐ N/A	**Is the ordinance an effective measure for reducing hazard impacts?**	☐ Yes ☐ No	**Comments:**
		Is the ordinance adequately administered and enforced?	☐ Yes ☐ No	**Comments:**

Building Code, Permitting, and Inspections	Have capability?	
Building Code	☒ Yes ☐ No ☐ N/A	**Version/Year:** IBC 2013
Building Code Effectiveness Grading Schedule (BGEGS) Score	☐ Yes ☒ No ☐ N/A	**Score:**

Fire Department ISO Rating	☒Yes ☐No ☐N/A	**Rating:** 6
Site Plan Review Requirements	☒Yes ☐No ☐N/A	**Review method:** City Development and Code Enforcement

Administrative and Technical Assessment

Administrative and technical capabilities include staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions.

Administration	**Have capability?**	**If Yes…**
Planning Commission	☒Yes ☐No ☐N/A	**Describe capability: Plan review by City Staff**
Mitigation Planning Committee	☒Yes	**Describe capability:**Identifies hazards, conducts a risk and vulnerability assessment, and creates and monitors mitigation actions.
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	☒Yes ☐No ☐N/A	**Describe capability: Completed by City Staff**
Mutual Aid Agreements	☒Yes ☐No ☐N/A	**Describe capability: Emergency Response with Hood County**

Staff	**Have capability? FT/PT***	**If Yes…**	
***Full-time (FT) or part-time (PT) position**			
Chief Building Official	☒Yes-FT ☐Yes- PT	**Is staffing adequate to enforce regulations?**	☒ Yes ☐No

Staff	Have capability? FT/PT*	If Yes…	
***Full-time (FT) or part-time (PT) position**			
	☐ No ☐ N/A	**Is staff trained on natural hazards and mitigation?**	☒ Yes ☐ No
Floodplain Administrator	☒ Yes-FT ☐ Yes- PT ☐ No ☐ N/A	**Is staffing adequate to enforce regulations?**	☐ Yes ☒ No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐ No
Emergency Manager	☐ Yes-FT ☒ Yes- PT ☐ No ☐ N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐ No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐ No
Community Planner	☐ Yes-FT ☐ Yes- PT ☒ No ☐ N/A	**Is staffing adequate to enforce regulations?**	☐ Yes ☐ No
		Is staff trained on natural hazards and mitigation?	☐ Yes ☐ No
Civil Engineer	☐ Yes-FT ☒ Yes- PT ☐ No ☐ N/A	**Is staffing adequate to enforce regulations?**	☐ Yes ☒ No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐ No
GIS Coordinator	☒ Yes-FT ☐ Yes- PT	**Is staffing adequate to enforce regulations?**	☒ Yes ☐ No

Staff	Have capability? FT/PT*	If Yes…	
***Full-time (FT) or part-time (PT) position**			
	☐ No ☐ N/A	**Is staff trained on natural hazards and mitigation?**	☒ Yes ☐ No
Public Works Director	☒ Yes-FT ☐ Yes- PT ☐ No ☐ N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐ No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐ No
Fire Chief	☐ Yes-FT ☒ Yes- PT ☐ No ☐ N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐ No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐ No
Environmental Director	☐ Yes-FT ☐ Yes- PT ☒ No ☐ N/A	**Is staffing adequate to enforce regulations?**	☐ Yes ☐ No
		Is staff trained on natural hazards and mitigation?	☐ Yes ☐ No

Technical	Have capability?	If Yes…	
Warning Systems/Services (e.g., Reverse 911, outdoor warning signals)	☒ Yes ☐ No ☐ N/A	**Describe capability. Hood County Code Red**	
		Has capability been used to assess or mitigate risk in the past?	☐ Yes ☒ No

Technical	Have capability?	If Yes…	
		If yes, for what type of event?	
Hazard data and information	☐Yes ☒No ☐N/A	**Describe capability:**	
		Has capability been used to assess or mitigate risk in the past?	☐ Yes ☐ No
		If yes, for what type of event?	
Grant writing	☒Yes ☐No ☐N/A	**Describe capability. Staff on Retainer**	
		Has capability been used to assess or mitigate risk in the past?	☐ Yes ☒ No
		If yes, for what type of event?	
HaZUS analysis or GIS software	☐Yes ☒No ☐N/A	**Describe capability:**	
		Has capability been used to assess or mitigate risk in the past?	☐ Yes ☐ No
		If yes, for what type of event?	

Education and Outreach Assessment

Education and outreach programs and methods can be used to implement mitigation activities and communicate hazard-related information.

Program or Organization	Have capability?	If Yes…	
Local citizen groups or non-profit organizations focused on environmental protection,	☐Yes ☒No	**Could the program or organization help implement future mitigation activities?**	☐ Yes ☐No

Program or Organization	Have capability?	If Yes…	
emergency preparedness, access and functional needs populations, etc.	☐N/A	**Describe program or organization and how it relates to disaster resilience and mitigation:**	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	☒Yes ☐No ☐N/A	**Could the program or organization help implement future mitigation activities?**	☒ Yes ☐No
		Describe program or organization and how it relates to disaster resilience and mitigation: Water Conservation, Home/Wildland Fire Safety	
Natural disaster or safety related school programs	☒Yes ☐No ☐N/A	**Could the program or organization help implement future mitigation activities?**	☒ Yes ☐No
		Describe program or organization and how it relates to disaster resilience and mitigation: School Fire Safety	
Public/private partnership initiatives addressing disaster-related issues	☒Yes ☐No ☐N/A	**Could the program or organization help implement future mitigation activities?**	☒ Yes ☐No
		Describe program or organization and how it relates to disaster resilience and mitigation: NWS-Ambassador Program	
StormReady certification	☒Yes ☐No ☐N/A	StormReady communities are better prepared to save lives from the onslaught of severe weather through advanced planning, education and awareness. To be officially StormReady, a community must: ▪ Establish a 24-hour warning point and emergency operations center ▪ Have more than one way to receive severe weather warnings and forecasts and to alert the public ▪ Create a system that monitors weather conditions locally ▪ Promote the importance of public readiness through community seminars ▪ Develop a formal hazardous weather plan, which includes training severe weather spotters and holding emergency exercises.	

Program or Organization	Have capability?	If Yes…
Firewise Communities Certification	☒Yes ☐No ☐N/A	National Fire Protection Association's (NFPA's) Firewise USA™ program teaches people how to adapt to living with wildfire and encourages neighbors to work together and take action now to prevent losses. A FireWise community will integrate the following standards into its plan of action: • Form a board/committee that's comprised of residents and other applicable wildfire stakeholders. This group will collaborate on developing the site's risk reduction priorities, develop a multi-year action plan based on the risk assessment and oversee the completion of the annual renewal requirements needed to retain an "in good standing" status. • At a minimum, each site is required to invest the equivalent of $24.14 per dwelling unit in wildfire risk reduction actions annually (the rate is based on the 2017 annual National Hourly Volunteer Rate; which is updated every year in April when the new amount is published • Each participating site is required to have a minimum of one wildfire risk reduction educational outreach event, or related activity annually. • Every year participating sites must submit an annual renewal to maintain their "In Good Standing" status.

Financial Assessment

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resources	Have capability?	If Yes…	
Capital Improvements Project funding	☒Yes ☐No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐ No
		Has the funding resource been used in past?	☐ Yes

Funding Resources	Have capability?	If Yes…	
			☒ No
		If yes, for what type of mitigation activities?	
Authority to levy taxes for specific purposes	☒Yes ☐No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	
Fees for water, sewer, gas, and/or electric services	☒Yes ☐No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	
Impact fees for new development	☒Yes ☐No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	
Stormwater utility fee	☐Yes ☒No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☐ Yes ☐ No

Funding Resources	Have capability?	If Yes…	
		Has the funding resource been used in past?	☐ Yes ☐ No
		If yes, for what type of mitigation activities?	
Incurrence of debt through general obligation bonds and/or special tax bonds	☒Yes ☐No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	
Incur debt through private activities	☐Yes ☒No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☐ Yes ☐ No
		Has the funding resource been used in past?	☐ Yes ☐ No
		If yes, for what type of mitigation activities?	
Community Development Block Grant	☒Yes ☐No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	
	☒Yes	**Could the resource be used to fund future mitigation actions?**	☒ Yes

Funding Resources	Have capability?	If Yes…	
Other federal funding programs (e.g. FEMA mitigation grants)	☐No ☐N/A		☐ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	
State funding programs	☒Yes ☐No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	

How can these capabilities be expanded and improved to reduce risk?
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.

Hood County Unincorporated

Planning and Regulatory Assessment

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of natural hazards.

Type of Plans	Have capability?	Level	If Yes…		
Comprehensive or Master Plan	☒Yes ☐No	☐ Local	**Does the plan address natural hazards?**	☒Yes ☐No	**Comments:**

Type of Plans	Have capability?	Level	If Yes…		
	☐N/A	☒ County ☐ Region	**Does the plan identify projects to include in the mitigation strategy?**	☒Yes ☐No	**Comments:**
			Can the plan be used to implement mitigation actions?	☒Yes ☐No	**Comments:**
Capital Improvement Plan (CIP)	☐Yes ☒No ☐N/A	☐ Local ☒ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Economic Development Plan	☒Yes ☐No ☐N/A	☐ Local ☒ County ☐ Region	**Does the plan address natural hazards?**	☒Yes ☐No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☒Yes ☐No	**Comments:**
			Can the plan be used to implement mitigation actions?	☒Yes ☐No	**Comments:**
Local Emergency Operations Plan	☒Yes ☐No	☐ Local	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**

Type of Plans	Have capability?	Level	If Yes…		
	☐N/A	☒ County ☐ Region	**Does the plan identify projects to include in the mitigation strategy?**	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Continuity of Operations Plan	☒Yes ☐No ☐N/A	☐ Local ☒ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Transportation Plan	☐Yes ☒No ☐N/A	☐ Local ☒ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Stormwater Management Plan	☐Yes ☒No	☐ Local	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**

Type of Plans	Have capability?	Level	If Yes…		
	☐N/A	☒ County ☐ Region	**Does the plan identify projects to include in the mitigation strategy?**	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Community Wildfire Protection Plan	☐Yes ☒No ☐N/A	☐ Local ☒ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Green Infrastructure Plan	☐Yes ☒No ☐N/A	☐ Local ☒ County ☐ Region	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Parks or Open Space Plan	☐Yes ☒No	☐ Local	**Does the plan address natural hazards?**	☐Yes ☒No	**Comments:**

Type of Plans	Have capability?	Level	If Yes…		
	☐N/A	☒ County ☐ Region	**Does the plan identify projects to include in the mitigation strategy?**	☐Yes ☒No	**Comments:**
			Can the plan be used to implement mitigation actions?	☐Yes ☒No	**Comments:**
Hazard Mitigation Plan	☒Yes ☐No ☐N/A	☐ Local ☒ County ☐ Region	**Does the plan address natural hazards?**	☒Yes ☐No	**Comments:**
			Does the plan identify projects to include in the mitigation strategy?	☒Yes ☐No	**Comments:**
			Can the plan be used to implement mitigation actions?	☒Yes ☐No	**Comments:**

Land Use Planning and Ordinances	Have capability?	If Yes…		
Zoning Ordinance	☐Yes ☒No ☐N/A	**Is the ordinance an effective measure for reducing hazard impacts?**	☐Yes ☒No	**Comments:**
		Is the ordinance adequately administered and enforced?	☐Yes ☒No	**Comments:**
Subdivision Ordinance	☒Yes ☐No	**Is the ordinance an effective measure for reducing hazard impacts?**	☒Yes ☐No	**Comments:**

Land Use Planning and Ordinances	Have capability?	If Yes…		
	☐N/A	**Is the ordinance adequately administered and enforced?**	☒Yes ☐No	**Comments:**
Floodplain Ordinance	☒Yes ☐No ☐N/A	**Is the ordinance an effective measure for reducing hazard impacts?**	☒Yes ☐No	**Comments:**
		Is the ordinance adequately administered and enforced?	☒Yes ☐No	**Comments:**
Flood Insurance Rate Maps (FIRM)	☒Yes ☐No ☐N/A	**Is the FIRM an effective measure for reducing hazard impacts?**	☒Yes ☐No	**Comments:**
		Is the FIRM adequately administered and enforced?	☒Yes ☐No	**Comments:**
Natural Hazard Specific Ordinance (e.g., stormwater, wildfire)	☐Yes ☒No ☐N/A	**Is the ordinance an effective measure for reducing hazard impacts?**	☐Yes ☒No	**Comments:**
		Is the ordinance adequately administered and enforced?	☐Yes ☒No	**Comments:**
Acquisition of land for open space and public recreation uses	☐Yes ☒No ☐N/A	**Is the ordinance an effective measure for reducing hazard impacts?**	☐Yes ☒No	**Comments:**
		Is the ordinance adequately administered and enforced?	☐Yes ☒No	**Comments:**

Building Code, Permitting, and Inspections	Have capability?	
Building Code	☐Yes ☒No ☐N/A	**Version/Year:**
Building Code Effectiveness Grading Schedule (BGEGS) Score	☐Yes ☐No ☒N/A	**Score:**
Fire Department ISO Rating	☐Yes ☐No ☒N/A	**Rating:**
Site Plan Review Requirements	☒Yes ☐No ☐N/A	**Review method:** Staff Review

Administrative and Technical Assessment

Administrative and technical capabilities include staff and their skills and tools that can be used for mitigation planning and to implement specific mitigation actions.

Administration	Have capability?	If Yes…
Planning Commission	☐Yes ☒No ☐N/A	**Describe capability:**
Mitigation Planning Committee	☒Yes	**Describe capability:** Identifies hazards, conducts a risk and vulnerability assessment, and creates and monitors mitigation actions.
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	☒Yes ☐No ☐N/A	**Describe capability:**
Mutual Aid Agreements	☒Yes ☐No ☐N/A	**Describe capability: Fire, Dispatch, Emergency Management**

Staff	Have capability? FT/PT*	If Yes…	
***Full-time (FT) or part-time (PT) position**			
Chief Building Official	☐Yes-FT ☐Yes- PT ☐No ☒N/A	**Is staffing adequate to enforce regulations?**	☐ Yes ☒No
		Is staff trained on natural hazards and mitigation?	☐ Yes ☒No
Floodplain Administrator	☒Yes-FT ☐Yes- PT ☐No ☐N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐No
Emergency Manager	☒Yes-FT ☐Yes- PT ☐No ☐N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐No
Community Planner	☒Yes-FT ☐Yes- PT ☐No ☐N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐No
Civil Engineer	☒Yes-FT ☐Yes- PT ☐No ☐N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐No

GIS Coordinator	☒ Yes-FT ☐ Yes- PT ☐ No ☐ N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐ No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐ No
Public Works Director	☐ Yes-FT ☐ Yes- PT ☒ No ☐ N/A	**Is staffing adequate to enforce regulations?**	☐ Yes ☐ No
		Is staff trained on natural hazards and mitigation?	☐ Yes ☐ No
Fire Chief	☒ Yes-FT ☐ Yes- PT ☐ No ☐ N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐ No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐ No
Environmental Director	☒ Yes-FT ☐ Yes- PT ☐ No ☐ N/A	**Is staffing adequate to enforce regulations?**	☒ Yes ☐ No
		Is staff trained on natural hazards and mitigation?	☒ Yes ☐ No

Technical	**Have capability?**	**If Yes…**	
Warning Systems/Services (e.g., Reverse 911, outdoor warning signals)	☒ Yes ☐ No ☐ N/A	**Describe capability. Code Red, Outdoor Warning Sirens**	
		Has capability been used to assess or mitigate risk in the past?	☒ Yes ☐ No

Technical	Have capability?	If Yes…	
		If yes, for what type of event? Storm Notifications	
Hazard data and information	☒Yes ☐No ☐N/A	**Describe capability: Tier II**	
		Has capability been used to assess or mitigate risk in the past?	☒ Yes ☐ No
		If yes, for what type of event? Haz Mat Releases	
Grant writing	☐Yes ☒No ☐N/A	**Describe capability.**	
		Has capability been used to assess or mitigate risk in the past?	☐ Yes ☐ No
		If yes, for what type of event?	
HaZUS analysis or GIS software	☐Yes ☒No ☐N/A	**Describe capability:**	
		Has capability been used to assess or mitigate risk in the past?	☐ Yes ☐ No
		If yes, for what type of event?	

Education and Outreach Assessment

Education and outreach programs and methods can be used to implement mitigation activities and communicate hazard-related information.

Program or Organization	Have capability?	If Yes…	
Local citizen groups or non-profit organizations focused	☒Yes	**Could the program or organization help implement future mitigation activities?**	☒ Yes

Program or Organization	Have capability?	If Yes…	
on environmental protection, emergency preparedness, access and functional needs populations, etc.	☐No ☐N/A		☐No
		Describe program or organization and how it relates to disaster resilience and mitigation: CERT	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	☒Yes ☐No ☐N/A	**Could the program or organization help implement future mitigation activities?**	☒ Yes ☐No
		Describe program or organization and how it relates to disaster resilience and mitigation: Emergency Management, Fire	
Natural disaster or safety related school programs	☒Yes ☐No ☐N/A	**Could the program or organization help implement future mitigation activities?**	☒ Yes ☐No
		Describe program or organization and how it relates to disaster resilience and mitigation: Fire Prevention	
Public/private partnership initiatives addressing disaster-related issues	☒Yes ☐No ☐N/A	**Could the program or organization help implement future mitigation activities?**	☒ Yes ☐No
		Describe program or organization and how it relates to disaster resilience and mitigation: VOADS	
StormReady certification	☒Yes ☐No ☐N/A	StormReady communities are better prepared to save lives from the onslaught of severe weather through advanced planning, education and awareness. To be officially StormReady, a community must: ▪ Establish a 24-hour warning point and emergency operations center ▪ Have more than one way to receive severe weather warnings and forecasts and to alert the public ▪ Create a system that monitors weather conditions locally ▪ Promote the importance of public readiness through community seminars Develop a formal hazardous weather plan, which includes training severe weather spotters and holding emergency exercises.	

Program or Organization	Have capability?	If Yes…
Firewise Communities Certification	☒Yes ☐No ☐N/A	National Fire Protection Association's (NFPA's) Firewise USA™ program teaches people how to adapt to living with wildfire and encourages neighbors to work together and take action now to prevent losses. A FireWise community will integrate the following standards into its plan of action: • Form a board/committee that's comprised of residents and other applicable wildfire stakeholders. This group will collaborate on developing the site's risk reduction priorities, develop a multi-year action plan based on the risk assessment and oversee the completion of the annual renewal requirements needed to retain an "in good standing" status. • At a minimum, each site is required to invest the equivalent of $24.14 per dwelling unit in wildfire risk reduction actions annually (the rate is based on the 2017 annual National Hourly Volunteer Rate; which is updated every year in April when the new amount is published • Each participating site is required to have a minimum of one wildfire risk reduction educational outreach event, or related activity annually. Every year participating sites must submit an annual renewal to maintain their "In Good Standing" status.

Financial Assessment

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resources	Have capability?	If Yes…	
Capital Improvements Project funding	☒Yes ☐No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐ No
		Has the funding resource been used in past?	☐ Yes

Funding Resources	Have capability?	If Yes…	
			☒ No
		If yes, for what type of mitigation activities?	
Authority to levy taxes for specific purposes	☒Yes ☐No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	
Fees for water, sewer, gas, and/or electric services	☐Yes ☒No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☐ Yes ☒ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	
Impact fees for new development	☐Yes ☒No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☐ Yes ☒ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	
Stormwater utility fee	☐Yes ☒No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☐ Yes ☒ No

Funding Resources	Have capability?	If Yes…	
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	
Incurrence of debt through general obligation bonds and/or special tax bonds	☒Yes ☐No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☐ Yes ☒ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	
Incur debt through private activities	☐Yes ☒No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☐ Yes ☒ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	
Community Development Block Grant	☒Yes ☐No ☐N/A	**Could the resource be used to fund future mitigation actions?**	☒ Yes ☐ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	
	☒Yes	**Could the resource be used to fund future mitigation actions?**	☒ Yes

Funding Resources	Have capability?	If Yes…	
Other federal funding programs (e.g. FEMA mitigation grants)	☐ No ☐ N/A		☐ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	
State funding programs	☒ Yes ☐ No ☐ N/A	**Could the resource be used to fund future mitigation actions?**	☐ Yes ☒ No
		Has the funding resource been used in past?	☐ Yes ☒ No
		If yes, for what type of mitigation activities?	

How can these capabilities be expanded and improved to reduce risk?
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.

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Appendix C: NCTCOG Programs

The North Central Texas Council of Governments (NCTCOG) is a voluntary association of, by and for local governments, established to assist in regional planning. NCTCOG's purpose is to strengthen both the individual and collective power of local governments and to help them recognize regional opportunities, eliminate unnecessary duplication, and make joint decisions. NCTCOG consists of many departments that implement programs and projects that address the mitigation goals of the participating jurisdictions.

The Environment & Development Department at NCTCOG plays a major role in regional coordination and management of reports and projects that improve regional resilience to natural hazards through the following programs:

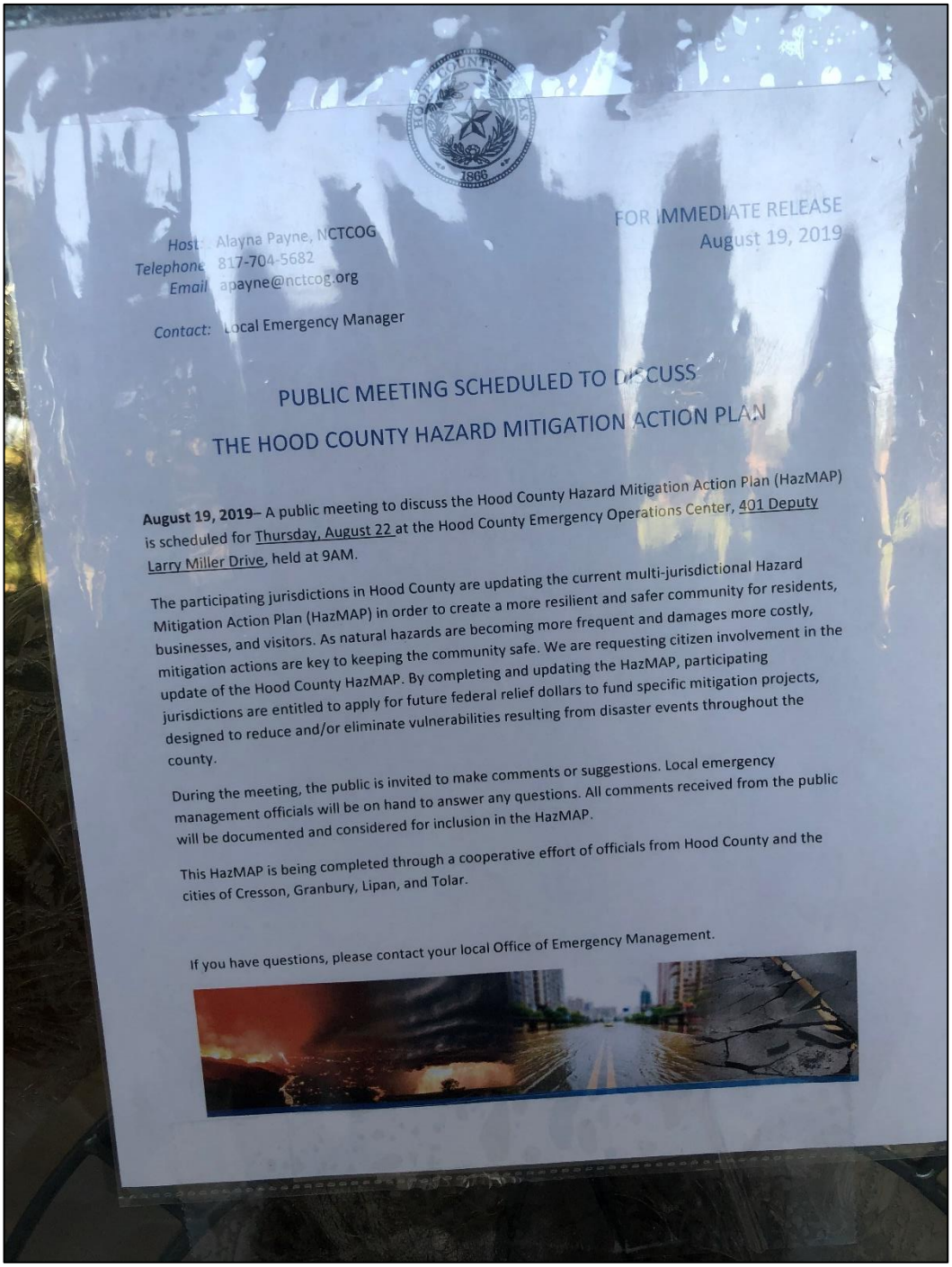
- **The Corridor Development Certificate (CDC)** – The CDC process aims to stabilize flood risk along the Trinity River. The CDC process does not prohibit floodplain development but ensures that any development that does occur in the floodplain will not raise flood water levels or reduce flood storage capacity. A CDC permit is required to develop land within a specific area of the Trinity floodplain called the Regulatory Zone, which is similar to the 100-year floodplain.
    - Under the CDC process, local governments retain ultimate control over floodplain permitting decisions, but other communities along the Trinity River Corridor are given the opportunity to review and comment on projects in their neighbor's jurisdiction. As the Metroplex economy continues to grow and develop, the CDC process will prevent increased flood risks
- **NCTCOG-OneRain Contrail Flood Warning Software**- Contrail software that delivers automated real-time data collection, processing, validation, analysis, archiving and visualization of hydrometeorological and environmental sensor data.
- **The *integrated* Stormwater Management (iSWM) Program**- The iSWM™ Program for Construction and Development is a cooperative initiative that assists cities and counties to achieve their goals of water quality protection, streambank protection, and flood mitigation, while also helping communities meet their construction and post-construction obligations under state stormwater permits.
    - Development and redevelopment by their nature increase the amount of imperviousness in our surrounding environment. This increased imperviousness translates into loss of natural areas, more sources for pollution in runoff, and heightened flooding risks. To help mitigate these impacts, more than 60 local governments are cooperating to proactively create sound stormwater management guidance for the region through the *integrated* Stormwater Management (iSWM) Program.
- **16-County Watershed Management Initiative**- Communities from across the region come together to collaborate on how to reduce the risks of flooding in their communities.
- **Texas Smartscape**- Texas SmartScape™ is a landscape program crafted to be "smart" for North Central Texas. Based on water-efficient landscape principles, it promotes the use of plants suited to our region's soil, climate, and precipitation that don't require much—if any—additional irrigation, pesticides, fertilizer, or herbicides to thrive.

    - The two main goals of the program are to:
        - Improve stormwater runoff quality
        - Conserve local water supplies
- The Transportation Department promotes the following programs:
- **Bicycle-Pedestrian-** The passage of the 1991 Intermodal Surface Transportation Efficiency Act prompted NCTCOG to include non-motorized transportation network improvements in regional planning efforts. NCTCOG established the Bicycle and Pedestrian program in 1992 to address the various activities related to implementing bicycle and pedestrian facilities as an alternative mode of regional transportation.
- **Sustainable Development**- As land uses influence regional travel patterns and demand on the transportation system, and transportation connects land uses and provides access to developments, both need to be planned in conjunction with one another. NCTCOG supports Sustainable Development: mixed-use, infill, and transit-oriented developments that reduce vehicle miles traveled, enable the use of alternative modes of transportation, promote economic development, and improve air quality.

Appendix D: Public Meeting Documents

The participants advertised public meetings to discuss the development of this Hazard Mitigation Action Plan, including the co-hosted meeting on August 22, 2019 at the Local Emergency Planning Committee (LEPC) Meeting in the Hood County Courthouse. The announcements of the public meetings are below.

City of Cresson



Host: Alayna Payne, NCTCOG
Telephone: 817-704-5682
Email: apayne@nctcog.org

Contact: Local Emergency Manager

FOR IMMEDIATE RELEASE
August 19, 2019

PUBLIC MEETING SCHEDULED TO DISCUSS
THE HOOD COUNTY HAZARD MITIGATION ACTION PLAN

August 19, 2019– A public meeting to discuss the Hood County Hazard Mitigation Action Plan (HazMAP) is scheduled for Thursday, August 22 at the Hood County Emergency Operations Center, 401 Deputy Larry Miller Drive, held at 9AM.

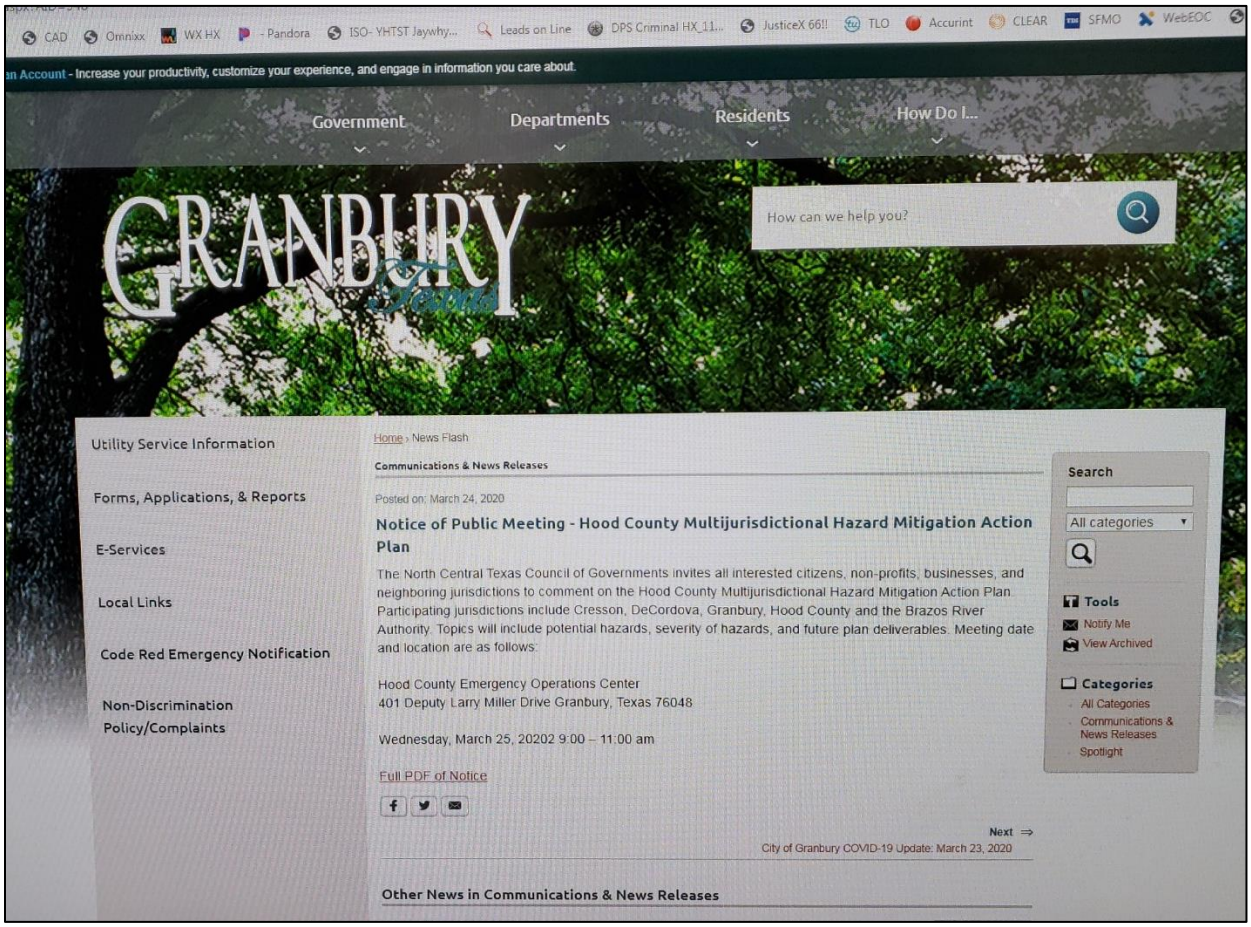
The participating jurisdictions in Hood County are updating the current multi-jurisdictional Hazard Mitigation Action Plan (HazMAP) in order to create a more resilient and safer community for residents, businesses, and visitors. As natural hazards are becoming more frequent and damages more costly, mitigation actions are key to keeping the community safe. We are requesting citizen involvement in the update of the Hood County HazMAP. By completing and updating the HazMAP, participating jurisdictions are entitled to apply for future federal relief dollars to fund specific mitigation projects, designed to reduce and/or eliminate vulnerabilities resulting from disaster events throughout the county.

During the meeting, the public is invited to make comments or suggestions. Local emergency management officials will be on hand to answer any questions. All comments received from the public will be documented and considered for inclusion in the HazMAP.

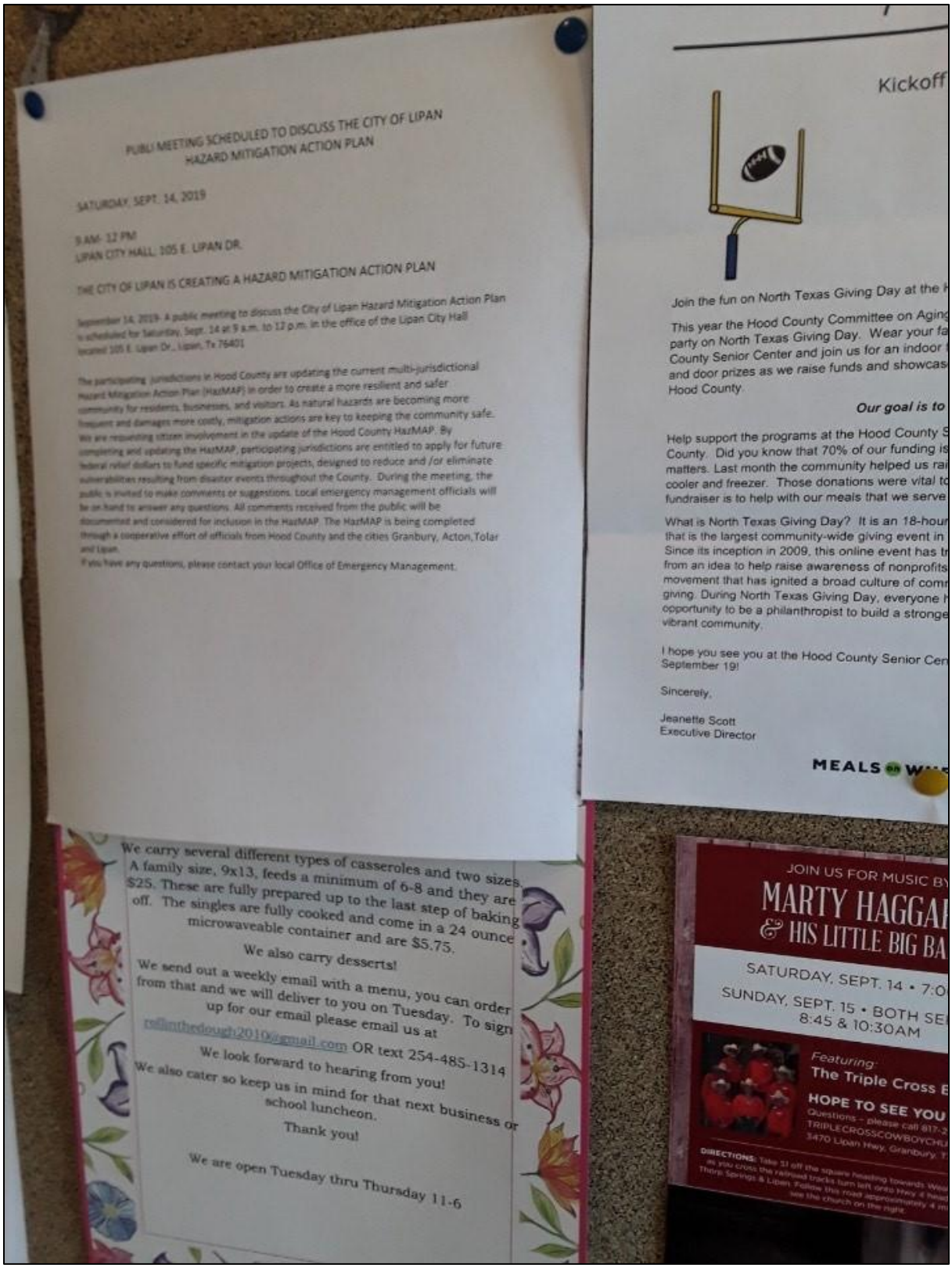
This HazMAP is being completed through a cooperative effort of officials from Hood County and the cities of Cresson, Granbury, Lipan, and Tolar.

If you have questions, please contact your local Office of Emergency Management.

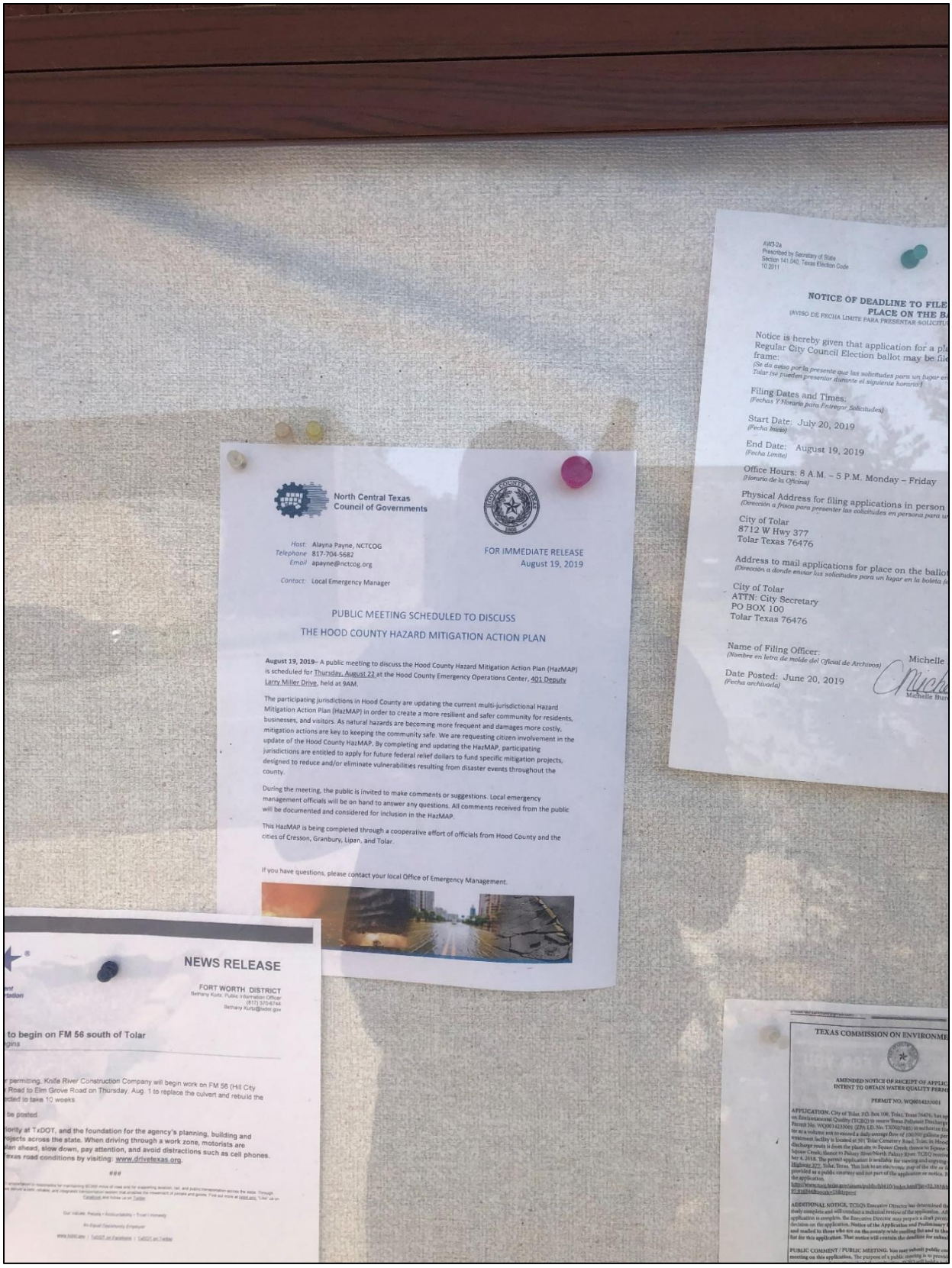
City of Granbury



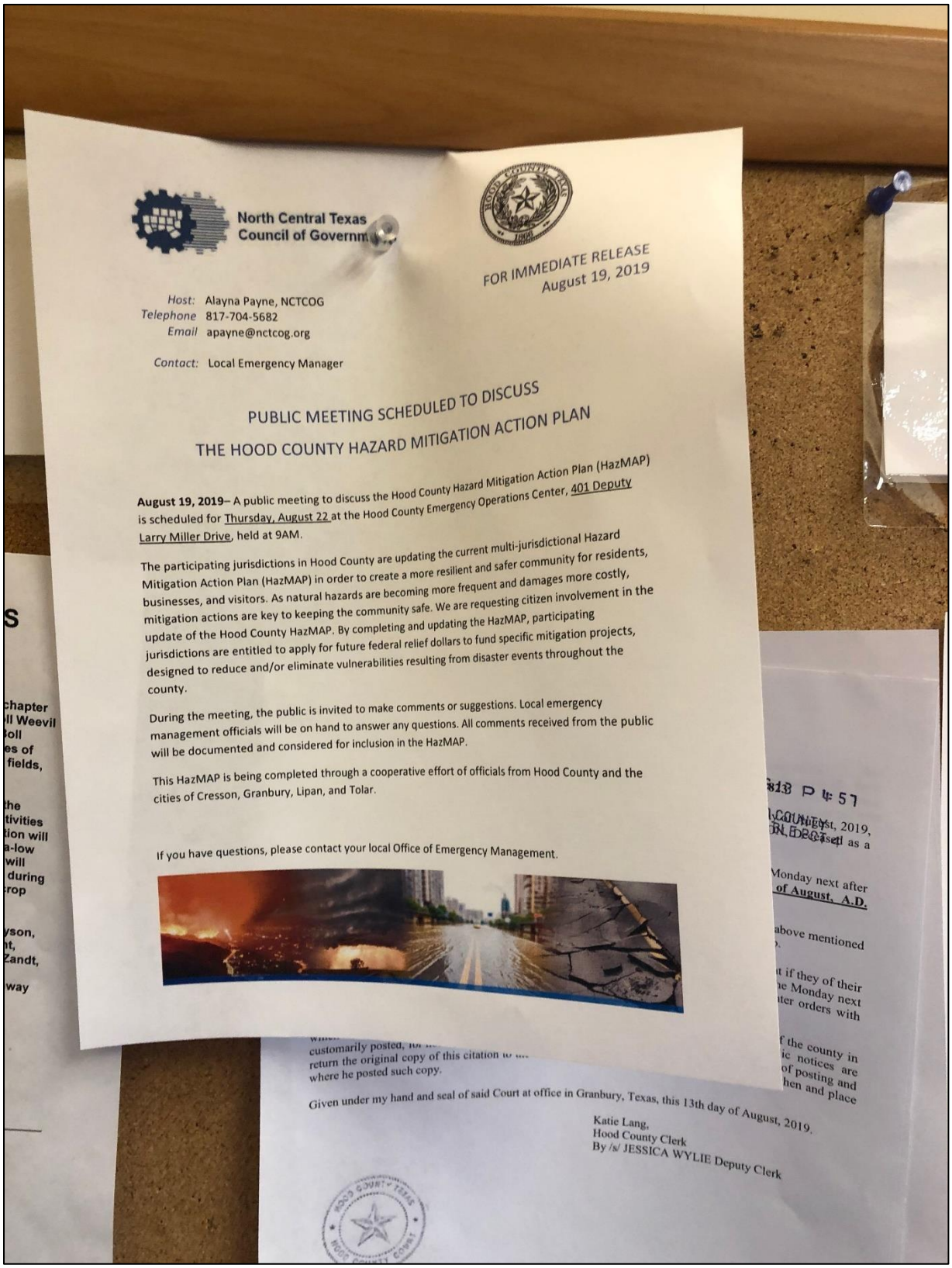
City of Lipan



City of Tolar



Hood County Unincorporated



North Central Texas Council of Governments

FOR IMMEDIATE RELEASE
August 19, 2019

Host: Alayna Payne, NCTCOG
Telephone 817-704-5682
Email apayne@nctcog.org

Contact: Local Emergency Manager

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This HazMAP is being completed through a cooperative effort of officials from Hood County and the cities of Cresson, Granbury, Lipan, and Tolar.

If you have questions, please contact your local Office of Emergency Management.

Given under my hand and seal of said Court at office in Granbury, Texas, this 13th day of August, 2019.

Katie Lang,
Hood County Clerk
By /s/ JESSICA WYLIE Deputy Clerk

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Appendix E: Local Planning Teams

The following tables identify the members of the Local Planning Team (LPT) from each participating jurisdiction.

City of Cresson		
Agency/Organization	**Position**	**Role in LPT**
City Administration	City Administrator	Hazard identification and plan development
City Administration	City Secretary	Hazard identification and plan development
Water Department	Director	Hazard identification and plan development
City of Granbury		
Agency/Organization	**Position**	**Role in LPT**
Granbury Fire Department	Fire Chief	General oversight hazard identification, and plan development
Public Works Department	Director	Hazard identification and plan development
Parks Department	Director	Hazard identification and plan development
City of Lipan		
Agency/Organization	**Position**	**Role in LPT**
City Water Department	Director	General oversight, hazard identification, and plan development
Fire Marshal's Office	Marshal	Hazard identification and plan development
City of Tolar		
Agency/Organization	**Position**	**Role in LPT**
Tolar Fire Department	Fire Chief	General oversight hazard identification, and plan development
Public Works Department	Director	General oversight hazard identification, and plan development
Planning & Zoning Department	Director	Hazard identification and plan development
Hood County Unincorporated		
Agency/Organization	**Position**	**Role in LPT**
Office of Emergency Management	Emergency Management Coordinator	General oversight hazard identification, and plan development
Environmental Department	Director	Hazard identification and plan development
Road Operations Department	Director	Hazard identification and plan development