BASTROP COUNTY
HAZARD MITIGATION ACTION PLAN



UPDATE 2022

Maintaining a Safe, Secure, and Sustainable Community

H2O PARTNERS

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SECTION 1: INTRODUCTION

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BACKGROUND

Bastrop County is located in southeast central Texas. Bounded on the north by Williamson County, on the northeast by Lee County, on the southeast by Fayette County, on the southwest by Caldwell County, and on the northwest by Travis County. Its county seat is Bastrop.

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

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

In 2016, the Texas Colorado River Floodplain Coalition (TCRFC) completed the TCRFC Multi-Jurisdictional Hazard Mitigation Plan Update 2011-2016 as a regional partnership of 15 counties (including Bastrop County) and 63 jurisdictions. This plan was to update the previous hazard mitigation action plan that was approved in 2004. Due to guidance from FEMA that requires individual hazard mitigation plans for each county, the Bastrop County Hazard Mitigation Plan Update (October 2016) was developed to be specific to Bastrop County and its participating communities: the Cities of Bastrop, Elgin, and Smithville.

The Disaster Mitigation Act requires that hazard mitigation plans be reviewed and revised every five years to maintain eligibility for Hazard Mitigation Assistance (HMA) grant funding. Since FEMA approved the Bastrop County Hazard Mitigation Plan Update in 2016, the County began the process of developing a Hazard Mitigation Action Plan Update in order to maintain eligibility for grant funding within the five-year window.

This Plan Update, hereinafter titled: “Bastrop County Hazard Mitigation Action Plan Update 2022: Maintaining a Safe, Secure, and Sustainable Community” (Plan or Plan Update) was developed

[1] http://www.floodsafety.com/texas/regional-info/san-antonio-flooding/
[2] http://www.fema.gov/hazard-mitigation-planning-resources

specifically for Bastrop County, and is a multi-jurisdictional Plan. The participating jurisdictions include Bastrop County, the City of Bastrop, the City of Elgin, the City of Smithville, Bastrop ISD, Elgin ISD, McDade ISD, Smithville ISD, MUD #1, WCID #2, and WCID #3.

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

SCOPE

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

PURPOSE

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

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

Participating jurisdictions within Bastrop County, and planning participants identified thirteen natural hazards and four man-made hazards to be addressed by the Plan Update. The specific goals of the Plan Update are to:

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

SECTION 1: INTRODUCTION

AUTHORITY

The Plan is tailored specifically for participating jurisdictions within Bastrop County and plan participants including Planning Team members, stakeholders, and the general public who participated in the Plan Update development process. The Plan complies with all requirements promulgated by the Texas Division of Emergency Management (TDEM) and all applicable provisions of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Section 104 of the Disaster Mitigation Act of 2000 (DMA 2000) (P.L. 106-390), and the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004 (P.L. 108–264), which amended the National Flood Insurance Act (NFIA) of 1968 (42 U.S.C. 4001, et al). Additionally, the Plan complies with the Interim Final Rules for the Hazard Mitigation Planning and Hazard Mitigation Grant Program (44 CFR, Part 201), which specify the criteria for approval of mitigation plans required in Section 322 of the DMA 2000 and standards found in FEMA's "Local Mitigation Plan Review Guide" (October 2011), and the "Local Mitigation Planning Handbook" (March 2013). Additionally, the Plan is developed in accordance with FEMA's Community Rating System (CRS) Floodplain Management Plan standards and policies.

SUMMARY OF SECTIONS

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

Sections 4 through 21 present a hazard overview and information on individual natural hazards in the planning area. The hazards generally appear in order of priority based on potential losses to life and property, and other community concerns. For each hazard, the Plan Update presents a description of the hazard, a list of historical hazard events, and the results of the vulnerability and risk assessment process.

Section 22 presents hazard mitigation goals and objectives. Section 23 gives an analysis for the previous actions and Section 24 presents hazard mitigation actions for Bastrop County and the participating jurisdictions. Section 25 identifies Plan maintenance mechanisms.

The list of planning team members and stakeholders is located in Appendix A. Public survey results are analyzed and presented in Appendix B. Appendix C contains a detailed list of critical facilities for the area, and Appendix D is dam locations. Appendix E contains information regarding workshops and meeting documentation. Capability Assessment results for participating jurisdictions within Bastrop County are in Appendix F.[3]

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

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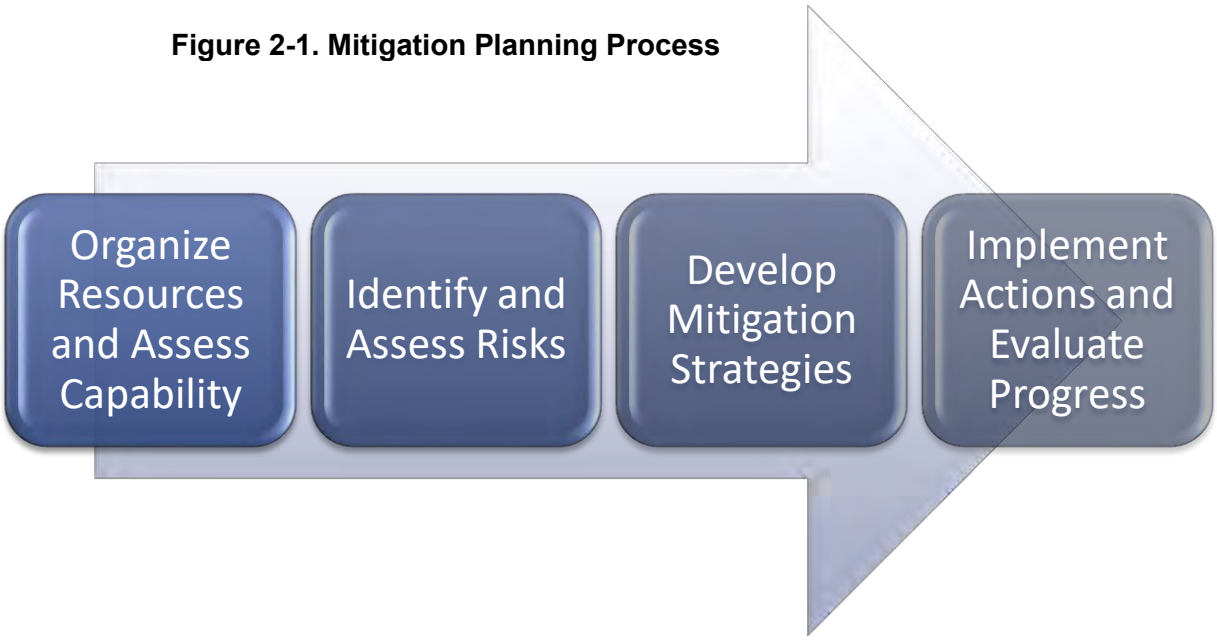
PLAN PREPARATION AND DEVELOPMENT

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

OVERVIEW OF THE PLAN

Bastrop County Office of Emergency Management hired H2O Partners, Inc. (Consultant Team), to provide technical support and oversee the development of the Bastrop County Hazard Mitigation Action Plan Update 2022. The Consultant Team used the FEMA "Local Mitigation Plan Review Guide" (October 1, 2011), and the "Local Mitigation Planning Handbook" (March 2013) to develop the Plan Update. The overall planning process is shown in Figure 2-1 below.

Figure 2-1. Mitigation Planning Process



Bastrop County, participating jurisdictions, and the Consultant Team met in May 2021 to begin organizing resources, identify Planning Team members, and conduct a Capability Assessment.

PLANNING TEAM

Key members of H2O Partners, Inc. developed the Plan Update in conjunction with the Planning Team. The Planning Team was established using a direct representation model. Some of the responsibilities of the Planning Team included: completing Capability Assessment surveys, providing input regarding the identification of hazards, identifying mitigation goals, and developing mitigation strategies. An Executive Planning Team consisting of key personnel from each of the participating jurisdictions within Bastrop County, shown in Table 2-1, was formed to coordinate planning efforts and request input and participation in the planning process. Table 2-2 reflects the Advisory Planning Team, consisting of additional representatives from area organizations and departments from the participating jurisdictions within Bastrop County that participated throughout the planning process.

Table 2-1. Executive Planning Team

ORGANIZATION / DEPARTMENT	TITLE
Bastrop County	Emergency Management Coordinator
Bastrop County	County Engineer
City of Bastrop	Emergency Management Coordinator
City of Elgin	Interim Police Chief
City of Smithville	City Manager
Bastrop ISD	Director of Safety and Security

ORGANIZATION / DEPARTMENT	TITLE
Elgin ISD	Director of Safety and Security
McDade ISD	Interim Superintendent
Smithville ISD	State & Federal Programs Director
Bastrop County MUD #1	President, Board of Directors
Bastrop County WCID #2	General Manager
Bastrop County WCID #3	Public Information Officer

Table 2-2. Advisory Planning Team

ORGANIZATION / DEPARTMENT	TITLE
Bastrop County	Assistant Emergency Management Coordinator
Bastrop County	Floodplain Administrator
Bastrop County	Precinct 2 County Commissioner
Bastrop County	Precinct 3 County Commissioner
City of Bastrop	Director of Planning and Development
City of Bastrop	City Manager
City of Bastrop	Senior Planner and GIS Coordinator
City of Elgin	City Manager
City of Smithville	Emergency Management Coordinator
City of Smithville	Mayor
Bastrop ISD	Superintendent
Elgin ISD	Superintendent
McDade ISD	Administrative Assistant to Superintendent
McDade ISD	Director of Operations
Smithville ISD	Superintendent
Bastrop County MUD #1	Former President, Board of Directors
Bastrop County WCID #2	Board Member / Secretary

Additionally, a Stakeholder Group was invited to participate in the planning process via e-mail. The Consultant Team, Planning Teams, and Stakeholder Group coordinated to identify mitigation goals, and develop mitigation strategies and actions for the Plan. Appendix A provides a complete listing of all participating Planning Team members and stakeholders from participating jurisdictions within Bastrop County by organization and title.

Based on results of completed Capability Assessment, participating jurisdictions within Bastrop County described methods for achieving future hazard mitigation measures by expanding existing capabilities. For example, several of the jurisdictions do not have a community wildfire protection plan in place. Other options for improving capabilities include the following:

- Establishing Planning Team members with the authority to monitor the Plan and identify grant funding opportunities for expanding staff.
- Identifying opportunities for cross-training or increasing the technical expertise of staff by attending free training available through FEMA and the Texas Division of Emergency Management (TDEM) by monitoring classes and availability through preparingtexas.org.
- Reviewing current floodplain ordinances for opportunities to increase resiliency such as modifying permitting or building codes.
- Developing ordinances that will require all new developments to conform to the highest mitigation standards.

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

The Planning Team developed hazard mitigation actions for mitigating risk from all of the hazards including potential flooding, hail, and extreme heat. The actions include but are not limited to drainage improvement projects, installing generators at critical facilities, and educating citizens to practice hazard mitigation techniques.

PLANNING PROCESS

The process used to prepare the Plan Update followed the four major steps included at Figure 2-1. After the Planning Team was organized, a capability assessment was developed and distributed at the Kick-Off Workshop. Hazards were identified and assessed, and results associated with each of the hazards were provided at the Risk Assessment Workshop. Based on Bastrop County's identified vulnerabilities, specific mitigation strategies were discussed and developed at the Mitigation Strategy Workshop. Finally, Plan maintenance and implementation procedures were developed and are included in Section 25. Participation of Planning Team members, stakeholders, and the public at each of the workshops is documented in Appendix E.

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

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

- How participating jurisdictions within Bastrop County, agencies, and partners will participate in implementing the Plan Update.

KICKOFF WORKSHOP

The Kickoff Workshop was held on June 3, 2021 via webinar. The initial workshop informed participating officials and key department personnel about how the planning process pertained to their distinct roles and responsibilities and engaged stakeholder groups including, but not limited to Bluebonnet Electric, Aqua Water Corporation, Ascension Seton Bastrop Hospital, Capital Area Council of Governments, and neighboring counties. In addition to the kickoff presentation, participants received the following information:

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

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

HAZARD IDENTIFICATION

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

RISK ASSESSMENT

An initial risk assessment for participating jurisdictions within Bastrop County was completed in September 2021 and results were presented to Planning Team members at the Risk Assessment Workshop held on September 23, 2021 via webinar. At the workshop, the characteristics and consequences of each hazard were evaluated to determine the extent to which the planning area would be affected in terms of potential danger to property and citizens.

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

The assessments were also used to set priorities for hazard mitigation actions based on potential loss of lives and dollar losses. A hazard profile and vulnerability analysis for each of the hazards can be found in Sections 4 through 21.

MITIGATION REVIEW AND DEVELOPMENT

Developing the Mitigation Strategy for the Plan involved identifying mitigation goals and new mitigation actions. A Mitigation Workshop was held on November 17, 2021 via webinar. In addition to the Planning Team, stakeholder groups were invited to attend the workshop. Regarding hazard mitigation actions, workshop participants emphasized the desire for flood and wildfire projects. Additionally, the participating jurisdictions were proactive in identifying mitigation actions to lessen the risk of all the identified hazards included in the Plan Update.

An inclusive and structured process was used to develop and prioritize new hazard mitigation actions for the Plan Update. The prioritization method was based on FEMA's STAPLE+E criteria and included social, technical, administrative, political, legal, economic, and environmental considerations. As a result, each Planning Team Member assigned an overall priority to each hazard mitigation action. The overall priority of each action is reflected in the hazard mitigation actions found in Section 24.

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

Specifically, the process involved:

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

Hazard mitigation actions identified in the process were made available to the Planning Team for review. The draft Plan Update was made available to the general public for review on the County's website, along with the participating jurisdictions' websites, with the chance to comment via sending an email.

REVIEW AND INCORPORATION OF EXISTING PLANS

REVIEW

Background information utilized during the planning process included various studies, plans, reports, and technical information from sources such as FEMA, the United States Army Corps of Engineers (USACE), the U.S. Fire Administration, National Oceanic and Atmospheric Administration (NOAA), the Texas Water Development Board (TWDB), the Texas Commission on Environmental Quality (TCEQ), the Texas State Data Center, Texas Forest Service, the Texas Division of Emergency Management (TDEM), and local hazard assessments and plans. Section 4 and the hazard-specific sections of the Plan (Sections 5-21) summarize the relevant background information.

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

INCORPORATION OF EXISTING PLANS INTO THE HMAP PROCESS

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

Existing projects and studies were utilized as a starting point for discussing hazard mitigation actions among Planning and Consultant Team members. For example, through the CRS Program, Bastrop County has identified potential projects regarding flood protection planning. Additionally, policies and ordinances were reviewed by several of the participating jurisdictions. These jurisdictions have included actions to develop and adopt higher building code standards. Other plans were reviewed, such as Emergency Operations Plan, to identify any additional mitigation actions. Finally, the 2018 State of Texas Hazard Mitigation Plan, developed by TDEM, was discussed in the initial planning meeting in order to develop a specific group of hazards to address in the planning effort. The 2018 State Plan was also used as a guidance document, along with FEMA materials, in the development of the Bastrop County Hazard Mitigation Action Plan Update 2022.

INCORPORATION OF THE HMAP INTO OTHER PLANNING MECHANISMS

Planning Team members will integrate implementation of the Plan Update with other planning mechanisms for Bastrop County, such as the Emergency Operations Plan. Existing plans for participating jurisdictions will be reviewed and incorporated into the Plan Update, as appropriate. This section discusses how the Plan will be implemented by the participating jurisdictions within

Bastrop County. It also addresses how the Plan will be evaluated and improved over time, and how the public will continue to be involved in the hazard mitigation planning process.

Participating jurisdictions within Bastrop County will be responsible for implementing hazard mitigation actions contained in Section 24. Each hazard mitigation action has been assigned to a specific County, City, ISD or Special District department that is responsible for tracking and implementing the action.

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

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

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

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

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

Table 2-3 identifies types of planning mechanisms and examples of methods for incorporating the Plan into other planning efforts.

Table 2-3. Examples of Methods of Incorporation

Planning Mechanism	Incorporation of Plan
Annual Budget Review	Various departments and key personnel that participated in the planning process for participating jurisdictions within Bastrop County will review the Plan and mitigation actions therein when conducting their annual budget review. Allowances will be made in accordance with grant applications sought, and

Planning Mechanism	Incorporation of Plan
	mitigation actions that will be undertaken, according to the implementation schedule of the specific action.
Capital Improvement Plans	Participating jurisdictions within Bastrop County have a Capital Improvement Plan (CIP) in place. Prior to any revisions to the CIP, County, City, ISD and Special District departments will review the risk assessment and mitigation strategy sections of the HMAP, as limiting public spending in hazardous zones is one of the most effective long-term mitigation actions available to local governments.
Comprehensive Plans	Several participating jurisdictions within Bastrop County have Long-term Comprehensive Development Plans in place. Since comprehensive plans involve developing a unified vision for a community, the mitigation vision and goals of the Plan will be reviewed in the development or revision of a Comprehensive Plan.
Floodplain Management Plans	Floodplain management plans include preventative and corrective actions to address the flood hazard. Therefore, the actions for flooding and information found in Section 5 of this Plan Update discussing the people and property at risk to flood will be reviewed and revised when participating jurisdictions within Bastrop County update their management plans or develops new plans.
Grant Applications	The Plan will be evaluated by participating jurisdictions within Bastrop County when grant funding is sought for mitigation projects. If a project is not in the Plan Update, a Plan Revision may be necessary to include the action in the Plan.
Regulatory Plans	Currently, participating jurisdictions within Bastrop County have regulatory plans in place, such as Emergency Management Plans, Continuity of Operations Plans, Land Use Plans, and Evacuation Plans. The Plan Update will be consulted when County, City, ISD and Special District departments review or revise their current regulatory planning mechanisms, or in the development of regulatory plans that are not currently in place.

Appendix F provides an overview of Planning Team members' existing planning and regulatory capabilities to support implementation of mitigation strategy objectives. Appendix F also provides further analysis of how each intends to incorporate hazard mitigation actions into existing plans,

policies, and the annual budget review as it pertains to prioritizing grant applications for funding and implementation of identified hazard mitigation projects.

It should be noted for the purposes of the Plan Update that the HMAP has been used as a reference when reviewing and updating all plans and ordinances for the entire planning area, including all participating jurisdictions. The Emergency Management Plans developed for Bastrop County, City of Bastrop, City of Elgin, City of Smithville, Bastrop ISD, Elgin ISD, McDade ISD, Smithville ISD, MUD#1, and WCID#2 are updated every 5 years and incorporates goals, objectives and actions identified in the mitigation plan.

PLAN REVIEW AND PLAN UPDATE

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

TIMELINE FOR IMPLEMENTING MITIGATION ACTIONS

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

Both the Executive and Advisory Planning Team will evaluate and prioritize the most suitable hazard mitigation actions for the community to implement. The timeline for implementation of actions will partially be directed by participating jurisdictions' comprehensive planning process, budgetary constraints, and community needs. Participating jurisdictions within Bastrop County are committed to addressing and implementing hazard mitigation actions that may be aligned with and integrated into the Plan Update.

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

PUBLIC AND STAKEHOLDER INVOLVEMENT

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

The public was involved in the development of the Bastrop County Hazard Mitigation Action Plan Update 2022 at different stages prior to official Plan approval and adoption. Public input was sought using three methods: (1) open public meetings; (2) survey instruments; and (3) making the draft Plan Update available for public review on participating jurisdictions' websites.

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

The Plan Update will be advertised and posted on Bastrop County and participating jurisdictions' websites upon approval from FEMA, and a copy will be kept at the Bastrop County courthouse.

STAKEHOLDER INVOLVEMENT

Stakeholder involvement is essential to hazard mitigation planning since a wide range of stakeholders can provide input on specific topics and from various points of view. Throughout the planning process, members of community groups, local businesses, neighboring jurisdictions, schools, and hospitals were invited to participate in development of the Plan Update. The Stakeholder Group (Table A-3 in Appendix A, and Table 2-4, below), included a broad range of representatives from both the public and private sector and served as a key component in Bastrop County's outreach efforts for development of the Plan Update. Documentation of stakeholder meetings is found in Appendix E. A list of organizations invited to attend via e-mail is found in Table 2-4.

Table 2-4. Stakeholder Working Group

AGENCY	TITLE	PARTICIPATED
Acadian Ambulance	Emergency Management Coordinator	
Ascension Seton Bastrop / Smithville Hospital	Emergency Management Coordinator	
Ascension Seton Bastrop / Smithville Hospital	Safety Officer II	X
Aqua Water Corporation	General Manager	
Austin American-Statesman	Reporter	X
Bastrop County ESD #1	Fire Chief	
Bastrop County ESD #2	Fire Chief	X
Bastrop County Long Term Recovery Team	Executive Director	X
Bluebonnet Electric	Emergency Management Coordinator	
Caldwell County	County Judge	
Caldwell County	Emergency Management Coordinator	

AGENCY	TITLE	PARTICIPATED
Capital Area Council of Governments	Regional Representative	
CCS Global Tech	SVP	X
Environmental Protection Agency, Region 6	Regional Administrator	
Fayette County	Emergency Management Coordinator	
Fayette County	Floodplain Manager	
Langford Community Management Services	HMAP Grant Administrator	
Lee County	Code Enforcement Officer	
Lee County	Emergency Management Coordinator	
Lower Colorado River Authority (LCRA)	Emergency Management Coordinator	
Railroad Commission of Texas, District #1 Field Office	Safety Coordinator	
St. David's Bastrop Emergency Center	FSED Manager	
Texas Commission on Environmental Quality (TCEQ), Region 11	Regional Director	
Texas Commission on Environmental Quality (TCEQ), Region 11	ERC	X
Texas Department of Transportation	Area Engineer	
Texas Department of Transportation	Area Engineer Assistant	
Texas Division of Emergency Management (TDEM)	District 12 Regional Coordinator	
Texas Forest Service	Regional Fire Coordinator	
Texas House District 14	Senator	
Texas House District 17	Legislative Representative	
Texas Parks and Wildlife	Park Superintendent	
Texas Water Board	Outreach Specialist	X
Travis County	Director of Emergency Management	
Williamson County	Emergency Management Coordinator	X
Williamson County	GIS Manager	

Stakeholders and participants from neighboring communities that attended the Planning Team and public meetings played a key role in the planning process. For example, wildfire was one of the concerns to stakeholders, so participating jurisdictions included actions to update the Community Wildfire Protection Plan, develop an Urban Wildland Interface Plan, and to install a network of dry hydrants in stock ponds, creeks, and small lakes to increase the supply of water for fire protection.

PUBLIC MEETINGS

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

Public meetings were held on the following dates and locations:

- June 3, 2021, Adobe Connect Webinar
- September 23, 2021, Adobe Connect Webinar
- November 17, 2021, Adobe Connect Webinar

PUBLIC PARTICIPATION SURVEY

In addition to public meetings, the Planning and Consultant Teams developed a public survey designed to solicit public input during the planning process from citizens and stakeholders and to obtain data regarding the identification of any potential hazard mitigation actions or problem areas. The survey was promoted by local officials and a link to the survey was posted on participating jurisdictions' websites. A total of 354 surveys were completed online. The survey results are analyzed in Appendix B. Participating jurisdictions within Bastrop County reviewed the input from the surveys and decided which information to incorporate into the Plan as hazard mitigation actions. For example, many citizens mentioned concerns about wildfire, and suggested wildfire mitigation along with additional communication and public awareness. In response, several actions were added to the Plan to implement a wildfire public awareness campaign with emphasis on emergency preparedness and prevention, along with communicating issuances of County-wide burn bans via social media outlets.

SECTION 3: COUNTY PROFILE

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Population and Demographics 4
ISD Population 5
Special District Population 5
Population Growth 6
Future Development 7
Economic Impact 7
Existing and Future Land Use and Development Trends 8

OVERVIEW

Bastrop County is located on State highways 71, 95, 21 and 304, on the upper Gulf coastal plains just below the Balcones Escarpment. The County comprises 895 square miles of southeast central Texas, of which 888 square miles are land and 7 square miles are covered by water. The seat of government, Bastrop, is situated in the center of the county, a location about 30 miles southeast of downtown Austin. The Colorado River bisects the county from northwest to southeast; along this waterway and its tributaries can be found rich alluvial silts and clays. Near the river, the Lost Pine Forest extends through an east central section of the county.

With an early road between Nacogdoches and San Antonio running through the region, in 1804 Spanish governor Manuel Antonio Cordero y Bustamante established a fort at the Colorado River crossing where the city of Bastrop now stands. The Baron de Bastrop planned a German community at the site, but it was not until after Stephen F. Austin obtained a grant for a “Little Colony” from the Mexican government in 1827 that settlement began. Pioneers met with intense Indian resistance, but by 1830 the city of Bastrop, named for the baron, had been founded and settlers from Austin’s lower colonies were clearing farms over the southern portion of the county.

In 1831 Austin received a second land grant; the two grants, Mina Municipality, took in almost all of what is now Bastrop County. The district was presumably named in honor of Spanish general Francisco Xavier Mina. In 1834 the vast municipality, comprising all or part of 16 present-day counties, was established by the government of Coahuila and Texas, and the city of Bastrop also took the name Mina. When Texas became a republic, Mina Municipality assumed its place as one of 23 original counties. In 1837 the Congress of the Republic of Texas changed the county name to Bastrop in honor of the baron and allowed the city to revert to the name as well. Congress also began whittling away at the boundaries of the huge county; in 1840, when Travis County was formed, Bastrop County shrank almost to its present dimensions.

In 1853 a county courthouse was constructed in Bastrop to replace the rented building that had been serving the purpose. The next year, 23 common-school districts were reported in the county. Settlement was spreading through the southern two-thirds of the county, with many immigrants

arriving from the southern United States. In addition, hundreds of German emigrants were joining the Americans or establishing their own communities.[1]

Figure 3-1 shows the general location of Bastrop County along with the cities within the County.

Figure 3-1. Location of Bastrop County

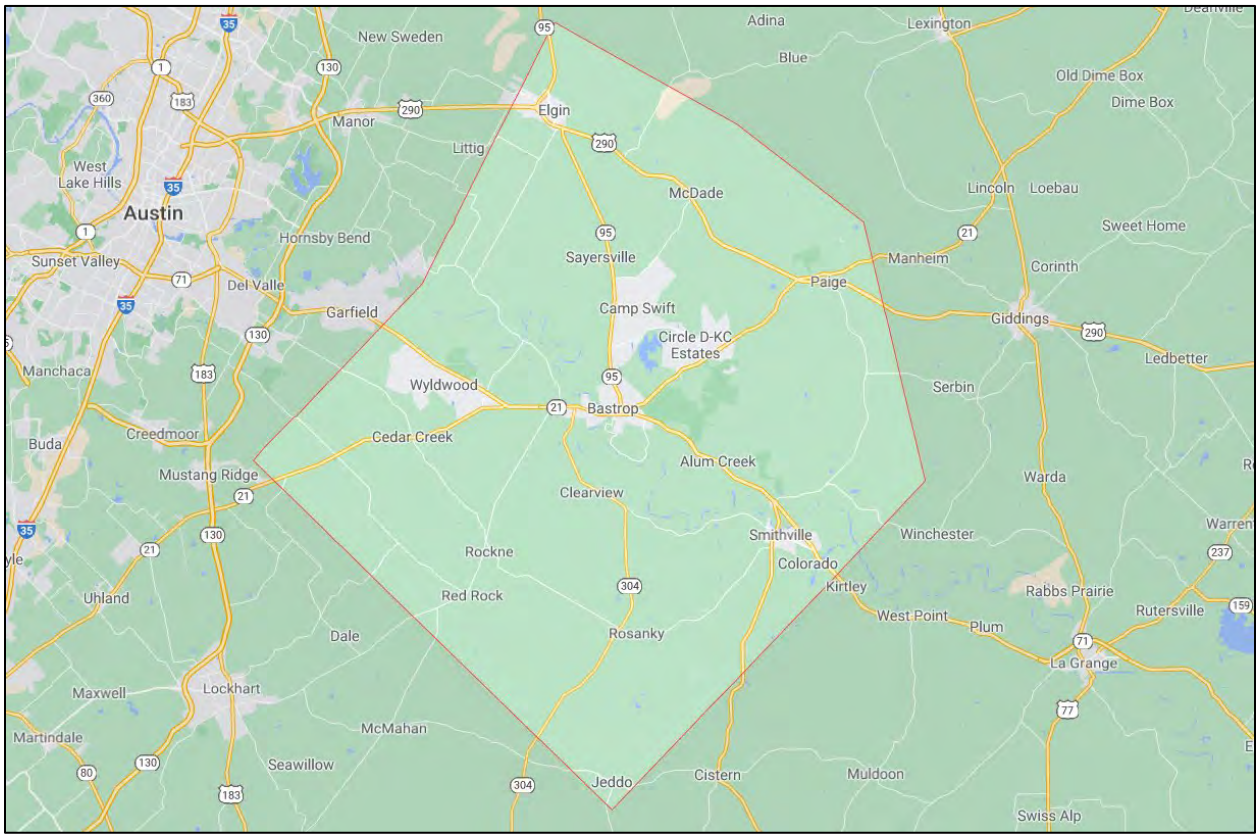
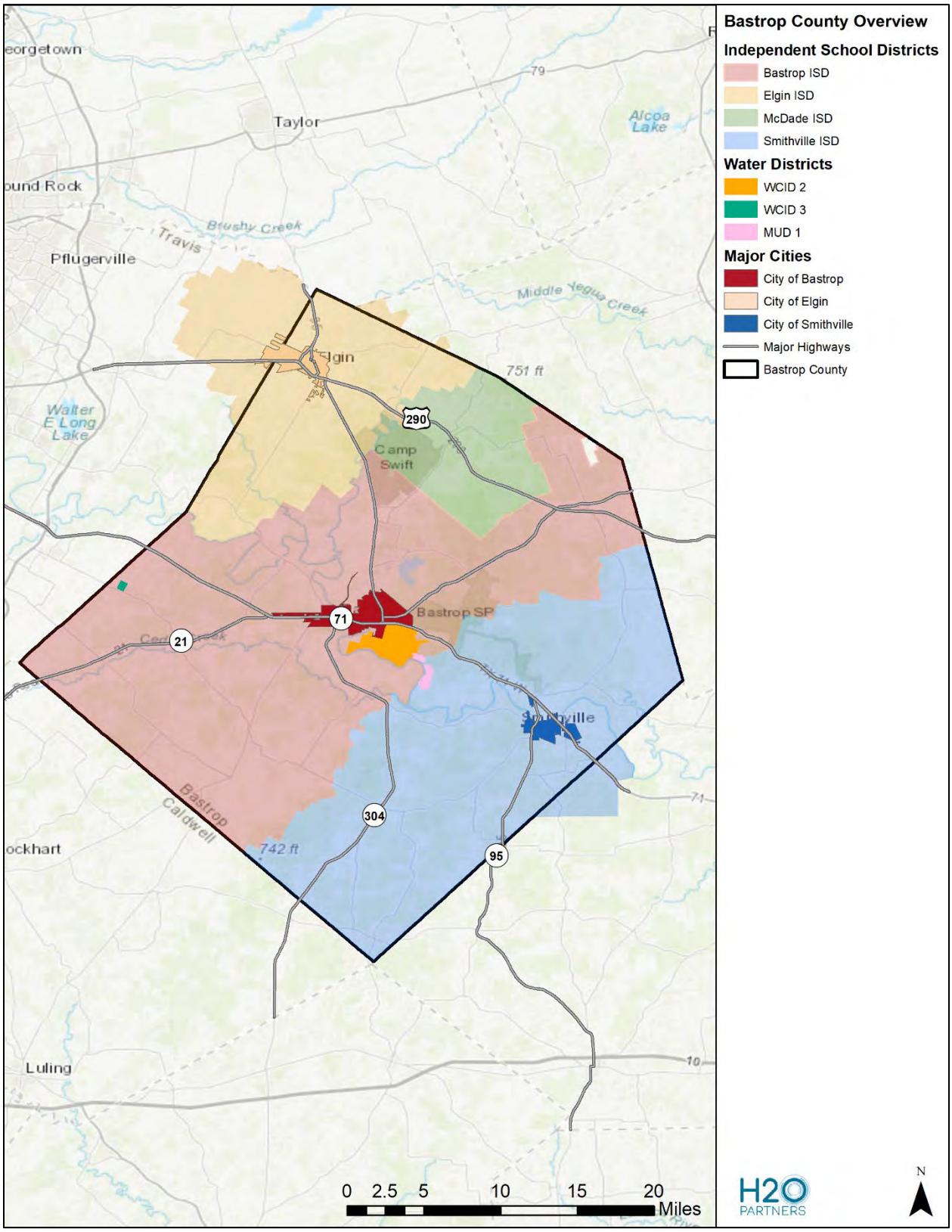


Figure 3-2 shows the participating jurisdictions within Bastrop County that are covered in the risk assessment analysis of the Plan Update.

[1] Source: https://www.tshaonline.org/handbook/entries/bastrop-county

Figure 3-2. Bastrop County Planning Area



SECTION 3: COUNTY PROFILE

Provided in Table 3-1 below is a listing of the jurisdictions in Bastrop County that participated in the Bastrop County Hazard Mitigation Action Plan Update 2022.

Table 3-1. Participating Jurisdictions

PARTICIPATING JURISDICTIONS	
Bastrop County	McDade ISD
City of Bastrop	Smithville ISD
City of Elgin	MUD #1
City of Smithville	WCID #2
Bastrop ISD	WCID #3
Elgin ISD	

POPULATION AND DEMOGRAPHICS

In the official Census population count, as of April 1, 2010, Bastrop County has a population of 74,171 residents. By 2019, the number was estimated at 84,522. Table 3-2 provides the population distribution by jurisdiction within Bastrop County based on the 2010 Census information.[2]

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

Table 3-2. Population Distribution by Jurisdiction

JURISDICTION	TOTAL 2010 POPULATION	PERCENTAGE (based on 2010 Population)	2019 POPULATION ESTIMATE	ESTIMATED VULNERABLE OR SENSITIVE POPULATIONS[3]		
				Youth (Under 5)	Elderly (Over 65)	Below Poverty Level
City of Bastrop	7,218	9.7%	8,776	812	1,555	1,158
City of Elgin	8,135	11.0%	10,064	727	1,161	1,339
City of Smithville	3,817	5.1%	4,363	246	1,060	393
Unincorporated Bastrop County	55,001	74.2%	61,319	3,734	8,527	6,576
Bastrop County	**74,171**	**100%**	**84,522**	**5,519**	**12,303**	**9,466**

[2] Source: https://www.census.gov/quickfacts/fact/table/bastropcountytexas,bastropcitytexas,elgincitytexas/PST045219

[3] The Estimated Vulnerable or Sensitive Populations are based off the 2019 American Community Survey.

ISD POPULATION

Bastrop ISD is a Pre-K to Grade 12 public school that serves students from the communities of Bastrop, Cedar Creek, Paige, Red Rock, Rockne, and vast rural areas of Bastrop County. As a leader in innovative, student-centered education, the mission of Bastrop ISD is to ignite passion for life-long learning and to successfully motivate and prepare all students to compete globally by ensuring they are engaged in diverse, rigorous, and relevant learning experiences that incorporate 21st Century skills. Bastrop ISD provides services for children under the age of 5.

The Elgin Independent School District is located approximately 22 miles east of Austin and in the Region 13 Education Service Center area. Elgin ISD comprises for than 168 square miles in portions of Bastrop, Lee, and Travis counties and provides educational facilities and resources to meet the needs of students in seven campuses. The mission of Elgin ISD is to ensure a high-quality education that guarantees a life-changing experience for all. Elgin ISD provides services for children under the age of 5.

The mission of McDade ISD is preparing and guiding our students to achieve success on their path to the future. McDade ISD provides services for children under the age of 5.

The Smithville ISD is a PreK to Grade 12 public school situated 45 miles southeast of Austin, 85 miles northeast of San Antonio, and 115 miles west of Houston. Smithville ISD serves students from within a 281-mile radius of Smithville, TX. The mission of Smithville ISD is to improve the academic performance of students. To achieve this goal the school district will provide effective instructional leadership, responsible fiscal management, and an atmosphere in which all students can develop and mature academically, physically, emotionally, and socially. Smithville ISD provides services for children under the age of 5.

Table 3-3 provides the number of people employed by each ISD.

Table 3-3. ISD Population

INDEPENDENT SCHOOL DISTRICT	EMPLOYEES	STUDENTS	ESTIMATED VULNERABLE OR SENSITIVE POPULATIONS	
			Children (Under 5)	Staff Works Outdoors
Bastrop ISD	1,399	11,147	389	70
Elgin ISD	820	4,600	214	45
McDade ISD	72	319	14	9
Smithville ISD	275	1,725	60	100

SPECIAL DISTRICT POPULATION

The Bastrop County Municipal Utility District No. 1 (MUD #1) was created by order of the Texas Natural Resource Conservation Commission, now the Texas Commission on Environmental Quality, dated July 25, 1999, and by a confirmation election held within the District on August 14, 1999. MUD #1 is located entirely within Bastrop County and outside the extra-territorial jurisdiction of any city, including the City of Bastrop. It contains approximately 702 acres of land adjacent to the Colorado River and is located approximately 5 miles southeast of the business district of the City of Bastrop. MUD #1 is empowered, among other things, to purchase, construct, operate and maintain all works, improvements, facilities and plants necessary for the supply and distribution of water and the collection, transportation and treatment of wastewater. The source

of water is groundwater from Aqua Water Supply Corporation pursuant to a Large Volume Service Agreement. Wastewater treatment for MUD #1 is provided by the district's wastewater treatment plant.

The Bastrop County Water Control and Improvement District (WCID) #2 was formed in 1985 to operate the water system which served the 7,000-lot subdivision known as Tahitian Village. Later the Texas Legislature gave the WCID #2 powers over the roads within the district's boundaries. The WCID #2 also operates the wastewater system. The WCID #2 is governed by a five-member board. Each board member is elected by Village residents and serves a four-year term.

The Bastrop County Water Control and Improvement District No. 3 (WCID #3) is a political subdivision of the State of Texas and serves the residents of the Elm Ridge Subdivision. It was created by an order of the commissioner's Court of Bastrop County, Texas on August 25, 1985, and confirmed by the electorate of the district at a confirmation election on July 25, 1986. The powers of WCID #3 are limited to those expressly provided for in the Texas Water Code and the Texas Constitution, and there is significant oversight provided by the Texas Commission on Environmental Quality (TCEQ). WCID #3 seeks to be responsive to resident questions and requests; require excellent performance and responsiveness from the consultants and contractors it engages; and display transparency and community outreach by making WCID #3 documents/meeting information available through their website and encouraging attendance at the district's board meetings.

Table 3-4 provides the number of people employed by each special district.

Table 3-4. Special District Population

SPECIAL DISTRICT	STAFF / EMPLOYEES	RESIDENTS THE DISTRICT SERVES	ESTIMATED VULNERABLE OR SENSITIVE POPULATIONS
			Staff Works Outdoors
MUD #1	5	500	5
WCID #2	16-20	5,500	10-12
WCID #3	0	213	0

POPULATION GROWTH

The official 2010 Bastrop County population is 74,171. Overall, Bastrop County experienced an increase in population between 1980 and 2019 by 241.8%, or an increase by 59,796. All of the participating jurisdictions experienced an increase in population between 1980 and 2019. Between 2010 and 2019, all the participating jurisdictions, including Bastrop County, as a whole, experienced a population growth. Table 3-5 provides historic growth rates in Bastrop County.

Table 3-5. Population for Bastrop County, 1980-2019

JURISDICTIONS	1980	1990	2000	2010	2019[4]	POP CHANGE 1980-2019	PERCENT OF CHANGE	POP CHANGE 2010-2019	PERCENT OF CHANGE
City of Bastrop	3,789	4,044	5,340	7,218	8,776	4,987	131.6%	1,558	21.6%
City of Elgin	4,535	4,846	5,700	8,135	10,064	5,529	121.9%	1,929	23.7%
City of Smithville	3,470	3,196	3,901	3,817	4,363	893	25.7%	546	14.3%
Unincorporated Bastrop County	12,932	26,177	42,792	55,001	61,319	48,387	374.2%	6,318	11.5%
Bastrop County	**24,726**	**38,263**	**57,733**	**74,171**	**84,522**	**59,796**	**241.8%**	**10,381**	**14.0%**

FUTURE DEVELOPMENT

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

Population projections from 2010 to 2050 are listed in Table 3-6, as provided by the Office of the State Demographer, Texas State Data Center, and the Institute for Demographic and Socioeconomic Research. Population projections are based on a 0.5 scenario growth rate, which is 50 percent of the population growth rate that occurred during 2000-2010. This information is only available at the County level; however, the population projection shows an increase in population density for the County, which would mean overall growth for the County.

Table 3-6. Bastrop County Population Projections

LAND AREA (SQ MI)	2010		2020		2030		2040		2050	
	Population									
	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)
888	74,171	83.53	86,105	96.97	99,211	111.72	112,145	126.29	125,002	140.77

ECONOMIC IMPACT

Building and maintaining infrastructure depends on the economy, and therefore, protecting infrastructure from risk due to natural hazards in the planning area is important to the participating jurisdictions within Bastrop County. Whether it's expanding culverts under a road that washes out during flash flooding, shuttering a fire station, or flood-proofing a wastewater facility,

[4] The 2019 Population is an Estimated Population County based off the 2019 American Community Survey.

infrastructure must be mitigated from natural hazards in order to continue providing essential utility and emergency response services in a fast-growing planning area.

Major employers in the area are critical to the health of the economy, as well as effective transportation connectivity. Bastrop County offers a business-friendly culture, great infrastructure, a community college, a talented workforce and dedicated partners, all in a beautiful setting. Their Texas Film Friendly hospitality, three historic downtowns, diverse landscapes and waterways, and proximity to major metropolitan areas and the Austin Bergstrom International Airport, also make this a great place for film productions. The county offers a wide variety of lodging facilities, hometown hospitality, beautiful recreation areas including Bastrop and Buescher State Parks, McKinney Roughs Nature Park, the Colorado River, and Lake Bastrop, and incredible entertainment venues.

The Art Institute, Ascension Seton Medical and JAMCo Construction are just a few of the companies that have moved to the City of Bastrop. These companies and others are taking advantage of the abundance of commercial land and affordable shovel-ready sites. Bastrop's tax, land and financial incentives make it an attractive prospect to all businesses seeking to relocate in an area with rural charm and urban growth. Families enjoy living in Bastrop because of its vibrant historic downtown that features live music, shops, pubs, and access to the Colorado River. Families are moving to Bastrop because it costs less to live here than in the surrounding metropolitan areas.

The City of Elgin is the right place to create jobs and communities in Central Texas. Elgin is a small town that is growing, in touch with its past and an eye on the future. Economic Development in the context of historic preservation makes this growing, dynamic downtown district flexible and a variety of resources and programs are available to support future investment. The City of Elgin is in the fastest growing region of the metro area. 20 miles from downtown Austin, 10 miles from SH 130 corridor, and both new roads and future rail links to get from here to there. The Elgin EDC, the City of Elgin, and the Greater Elgin Chamber of Commerce work together to ensure successful business expansion or relocation with cash incentives, discounted property, property tax assistance, small business assistance, and access to state assistance programs.

The City of Smithville is a small, rural Texas town, and a great place to do business. It has been a Gigabit City since 2013; its people are friendly, creative, and inventive; and its history, charm, amenities and terrific school district provide everything needed for a high quality of life. Located in Central Texas on Highway 71, Smithville is 45 minutes for AUS/Austin, one hour from San Marcos, 90 minutes from San Antonio, two hours from Houston, and four hours from Dallas/Fort Worth, by highway. The Smithville Crawford Municipal Airport, the only airport in the County, is located at the intersection of HWY 71 and SH 95. An Industrial Park is currently under development directly across from the Airport, adjacent to these two major highways.

EXISTING AND FUTURE LAND USE AND DEVELOPMENT TRENDS

The following jurisdictions have a Master or Comprehensive Plan in place: City of Bastrop, City of Elgin, City of Smithville, Bastrop ISD, and McDade ISD. These plans are part of a continuous process to provide an environment for the citizens and to consider the general desire of the community to conserve, preserve, and protect the natural environment of their jurisdiction. These

plans are used to guide individuals in making decisions which affect the community with the understanding of the long-term effects.

In 2017, the Bastrop County Commissioners adopted Opportunity Bastrop County – a Strategic Planning document carried out in partnership with the LCRA in consultation with the local community. The document sets priorities in the areas of: Environmental Growth and Management; Transportation Enhancement; Economic Development and Education Opportunities; Public Safety and Emergency Services; and Health care Services. The document gives a brief overview of the nature of growth within the County since the plan was adopted, and subsequently goes on to review the extent to which each of the objectives of the plan have been obtained ten years on.

The Bastrop Comprehensive Plan (2016-2036) is an update to the City's previous comprehensive Plan – originally adopted in 2001. This plan is a visionary policy document that guides long-term decision-making by City staff and officials on topics such as capital expenditures, staffing, and operations. By guiding these decisions, this document will: facilitate orderly growth and development; identify what is shaping the community; build consensus and commitment between elected/appointed officials, City staff, and citizens; and provide the City with a list of implementation actions. Having surpassed a population of 7,000, there is an evident need for the provision of additional housing, infrastructure, traffic control, and other facilities and amenities. The plan complements a master transportation plan that was developed concurrently by the City.

The City of Elgin's elected officials and government, business, and community have come together to express a collective vision for how they want their community to grow in the future. The Elgin Comprehensive Plan, a 20-year plan (through 2028) for physical development and growth, articulates that vision and provides guidance for how to achieve these goals. Through an extensive public outreach effort, the Plan outlines seven community-driven principles to guide the future of Elgin and articulate the community's philosophy of how growth and development should occur. The Plan provides a framework for focused urban growth that will integrate Elgin's rural character with sound community development, burgeoning local economy, and effective management of the City's public and private resources to sustain and enhance quality of life for residents. The Plan also provides an opportunity for coordination among the many different elements that are associated with growth and development in a proactive, coordinated effort to help the City achieve its ultimate objective of promoting the health, safety, and general welfare of residents.

The City of Smithville's Comprehensive Plan is a "living document". The 2007 Plan that LCRA facilitated is still in effect today, having more than 80% of the projects and priorities identified within it implemented or in progress. The Comprehensive Plan is designed to enable a community to enhance the quality of life for all present and future members by describing near-term improvements as well as long-term development; it is a blueprint for growth, designed by community members for community members, to help the city reach its fullest potential for all. The Vision of the plan is to maintain a small-town sense of community while encouraging positive growth and continually improved standards of living for the citizens of Smithville, Texas.

SECTION 4: RISK OVERVIEW

Hazard Description 1
Natural Hazards and Climate Change 4
Overview of Hazard Analysis 5

HAZARD DESCRIPTION

Section 4 is the first phase of the Risk Assessment, providing background information for the hazard identification process and descriptions for the hazards identified. The Risk Assessment continues with Sections 5 through 21, which include hazard descriptions and vulnerability assessments.

Upon a review of the full range of natural hazards suggested under FEMA planning guidance, participating jurisdictions within Bastrop County identified thirteen natural hazards and four man-made hazards that are addressed in the Hazard Mitigation Plan Update. Of the natural hazards identified, twelve natural hazards and one quasi-technological[1] hazard (dam/levee failure) were identified as significant, as shown in Table 4-1. The hazards were identified through input from Planning Team members and a review of the current 2018 State of Texas Hazard Mitigation Plan (State Plan). Readily available online information from reputable sources such as federal and state agencies were also evaluated and utilized to supplement information as needed.

In general, there are three main categories of natural hazards: atmospheric, hydrologic, and technological. Atmospheric hazards are events or incidents associated with weather generated phenomenon. Atmospheric hazards that have been identified as significant for the Planning Area include extreme heat, hail, hurricane / tropical storms, lightning, thunderstorm wind, tornado, and winter storm (Table 4-1).

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

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

For the Risk Assessment, the earthquake, expansive soils, and wildfire hazards are considered "other," since this hazard is not considered atmospheric, hydrologic, nor technological. The man-made hazards include: cyber-attack, hazardous materials, infectious disease, and pipeline failure.

[1] While dam failure is generally considered a quasi-technological hazard, it is profiled in the Plan Update as a natural hazard, i.e. a breach caused by extensive rainfall or flooding or from an earthquake.

Table 4-1. Hazard Descriptions

HAZARD	DESCRIPTION
ATMOSPHERIC	
Extreme Heat	Extreme heat is the condition whereby temperatures hover ten degrees or more above the average high temperature in a region for an extended period of time.
Hail	Hailstorms are a potentially damaging outgrowth of severe thunderstorms. Early in the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to the rapid rising of warm air into the upper atmosphere and subsequent cooling of the air mass.
Hurricane / Tropical Storm	A hurricane is an intense tropical weather system of strong thunderstorms with a well-defined surface circulation and maximum sustained winds of 74 mph or higher.
Lightning	Lightning is a sudden electrostatic discharge that occurs during an electrical storm. This discharge occurs between electrically charged regions of a cloud, between two clouds, or between a cloud and the ground.
Thunderstorm Wind	A thunderstorm occurs when an observer hears thunder. Radar observers use the intensity of the radar echo to distinguish between rain showers and thunderstorms. Lightning detection networks routinely track cloud-to-ground flashes, and therefore thunderstorms.
Tornado	A tornado is a violently rotating column of air that has contact with the ground and is often visible as a funnel cloud. Its vortex rotates cyclonically with wind speeds ranging from as low as 40 mph to as high as 300 mph. The destruction caused by tornadoes ranges from light to catastrophic, depending on the location, intensity, size, and duration of the storm.
Winter Storm	Severe winter storms may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Blizzards, the most dangerous of all winter storms, combine low temperatures, heavy snowfall, and winds of at least 35 miles per hour, reducing visibility to only a few yards. Ice storms occur when moisture falls and freezes immediately upon impact on trees, power lines, communication towers, structures, roads, and other hard surfaces. Winter storms and ice storms can down trees, cause widespread power outages, damage property, and cause fatalities and injuries to human life.
HYDROLOGIC	
Drought	A prolonged period of less than normal precipitation such that the lack of water causes a serious hydrologic imbalance. Common effects of drought include crop failure, water supply shortages, and fish and wildlife mortality.

HAZARD	DESCRIPTION
Flood	The accumulation of water within a body of water, which results in the overflow of excess water onto adjacent lands, usually floodplains. The floodplain is the land adjoining the channel of a river, stream, ocean, lake, or other watercourse or water body that is susceptible to flooding. Most floods fall into the following three categories: riverine flooding, coastal flooding, and shallow flooding.
OTHER	
Earthquake	An earthquake is the sudden, rapid, shaking of the earth, caused by the breaking and shifting of subterranean rock as it releases strain that has accumulated over a long time. Initial mild shaking may strengthen and become extremely violent within seconds.
Expansive Soils	Expansive soils are soils and soft rock that tend to swell or shrink due to changes in moisture content. Changes in soils volume present a hazard primarily to structures built on top of expansive soils.
Wildfire	A wildfire is an uncontrolled fire burning in an area of vegetative fuels such as grasslands, brush, or woodlands. Heavier fuels with high continuity, steep slopes, high temperatures, low humidity, low rainfall, and high winds all work to increase the risk for people and property located within wildfire hazard areas or along the urban/wildland interface. Wildfires are part of the natural management of forest ecosystems, but most are caused by human factors.
TECHNOLOGICAL	
Dam Failure	Dam failure is the collapse, breach, or other failure of a dam structure resulting in downstream flooding. In the event of a dam failure, the energy of the water stored behind even a small dam is capable of causing loss of life and severe property damage if development exists downstream of the dam.
MAN-MADE	
Cyber Attack	A cyber-attack is any type of offensive maneuver employed by individuals or whole organizations that targets computer information systems, infrastructures, computer networks, and/or personal computer devices by various means of malicious acts usually originating from an anonymous source that either steals, alters, or destroys a specified target by hacking into a susceptible system.
Hazardous Materials	A hazardous material (solid, liquid, or gaseous contaminants) of flammable or poisonous material that would be a danger to life or to the environment if released without precaution.

HAZARD	DESCRIPTION
Infectious Disease	A clinically evident disease resulting from the presence of pathogenic microbial agents. These infecting agents may be transmitted through liquids, food, bodily fluids, contaminated objects, airborne inhalation, or through vector-borne dissemination.
Pipeline Failure	Fuel pipeline breach or pipeline failure addresses the rare, but serious hazard of an oil or natural gas pipeline that, when breached, has the potential to cause extensive property damage and loss of life.

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

Table 4-2. Other Hazards Deferred

HAZARD CONSIDERED	REASON FOR DETERMINATION
Coastal Erosion	The planning area is not located on the coast, therefore coastal erosion does not pose a risk.
Land Subsidence	There are no historical occurrences of land subsidence for the planning area and it is located in an area where occurrences are considered rare. There is no history of impact to critical structures, systems, populations or other community assets or vital services as a result of land subsidence and none is expected in the future.

NATURAL HAZARDS AND CLIMATE CHANGE

Climate change is defined as a long-term hazard which can increase or decrease the risk of other weather hazards. It directly endangers property due to sea level rise and biological organisms due to habitat destruction.

Global climate change is expected to exacerbate the risks of certain types of natural hazards impacted through rising sea levels, warmer ocean temperatures, higher humidity, the possibility of stronger storms, and an increase in wind and flood damages due to storm surges. While sea level rise is a natural phenomenon and has been occurring for several thousand years, the general scientific consensus is that the rate has increased in the past 200 years, from 0.5 millimeters per year to 2 millimeters per year.

Texas is considered one of the more vulnerable states in the U.S. to both abrupt climate changes and to the impact of gradual climate changes to the natural and built environments. Mega-droughts can trigger abrupt changes to regional ecosystems and the water cycle, drastically increase extreme summer temperature and fire risk, and reduce availability of water resources, as Texas experienced during 2011-2012.

Paleoclimate records also show that the climate over Texas had large changes between periods of frequent mega-droughts and the periods of mild droughts that Texas is currently experiencing. While the cause of these fluctuations is unclear, it would be wise to anticipate that such changes could occur again and may even be occurring now.

OVERVIEW OF HAZARD ANALYSIS

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

Records retrieved from National Centers for Environmental Information (NCEI) and National Oceanic and Atmospheric Administration (NOAA) were reported for participating jurisdictions within Bastrop County. Remaining records identifying the occurrence of hazard events in the planning area and the maximum recorded magnitude of each event were also evaluated.

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

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

Frequency of return was calculated by dividing the number of events in the recorded time period for each hazard by the overall time period that the resource database was recording events. Frequency of return statements are defined in Table 4-3, and impact statements are defined in Table 4-4 below.

Table 4-3. Frequency of Return Statements

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

Table 4-4. Impact Statements

POTENTIAL SEVERITY	DESCRIPTION
Substantial	Multiple deaths. Complete shutdown of facilities for 30 days or more. More than 50 percent of property destroyed or with major damage.
Major	Injuries and illnesses resulting in permanent disability. Complete shutdown of critical facilities for at least two weeks. More than 25 percent of property destroyed or with major damage.

POTENTIAL SEVERITY	DESCRIPTION
Minor	Injuries and illnesses do not result in permanent disability. Complete shutdown of critical facilities for more than one week. More than 10 percent of property destroyed or with major damage.
Limited	Injuries and illnesses are treatable with first aid. Shutdown of critical facilities and services for 24 hours or less. Less than 10 percent of property destroyed or with major damage.

Each of the hazard profiles includes a description of a general Vulnerability Assessment. Vulnerability is the total of assets that are subject to damages from a hazard, based on historic recorded damages. Assets in the region were inventoried and defined in hazard zones where appropriate. The total amount of damages, including property and crop damages, for each hazard is divided by the total number of assets (building value totals) in that community to determine the percentage of damage that each hazard can cause to the community. Risk and consequences will be addressed and covered within each hazard profile under the Vulnerability and Impact section as well as under the Assessment of Impact sections, where applicable.

To better understand how future growth and development in the Bastrop County region might affect hazard vulnerability, it is useful to consider population growth, occupied and vacant land, the potential for future development in hazard areas, and current planning and growth management efforts. Hazard vulnerability for all participating jurisdictions within Bastrop County was reviewed based on recent development changes that occurred throughout the planning area. Bastrop County has increased slightly between 2010 and 2018 according to the U.S. Census Bureau, therefore there has been no significant factors or development trends with a consequential effect or increase in vulnerability to the population, infrastructure and buildings for hazards.

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

Table 4-5. Hazard Risk Ranking

HAZARD	FREQUENCY OF OCCURENCE	POTENTIAL SEVERITY
Flood	Highly Likely	Substantial
Wildfire	Highly Likely	Minor
Extreme Heat	Highly Likely	Limited
Tornado	Likely	Limited
Drought	Likely	Limited
Hurricane Wind	Unlikely	Limited

HAZARD	FREQUENCY OF OCCURENCE	POTENTIAL SEVERITY
Lightning	Highly Likely	Limited
Hail	Highly Likely	Limited
Thunderstorm Wind	Highly Likely	Limited
Winter Storm	Highly Likely	Limited
Dam/Levee Failure	Unlikely	Limited
Earthquake	Unlikely	Limited
Expansive Soils	Highly Likely	Limited
Infectious Disease	Unlikely	Substantial
Cyber Attack	Highly Likely	Major
Hazardous Material Release	Likely	Limited
Pipeline Failure	Unlikely	Minor

SECTION 5: FLOOD

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Probability of Future Events 18
Vulnerability and Impact 19
Assessment of Impacts 21
National Flood Insurance Program (NFIP) Participation 23
NFIP Compliance and Maintenance 24
Repetitive Loss 25

HAZARD DESCRIPTION

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

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

LOCATION

The Digital Flood Insurance Rate Map (DFIRM) data provided by FEMA for Bastrop County shows the following flood hazard areas:

- Zone A: Areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance requirements and floodplain management standards apply.
- Zone AE: Areas subject to inundation by 1-percent-annual-chance shallow flooding. It is the base floodplain where base flood elevations are provided. AE zones are now used on new format FIRMs instead of A1-30 zones.

- Zone X: Moderate risk areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent-annual-chance flood by a levee. No BFEs or base flood depths are shown within these zones.

Locations of flood zones in the Bastrop County planning area, including all participating jurisdictions, ISDs, and special districts, are based on the Digital Flood Insurance Rate Maps (DFIRM) from FEMA are illustrated in Figures 5-1 to 5-11.

Figure 5-1. Estimated Flood Zones in Bastrop County

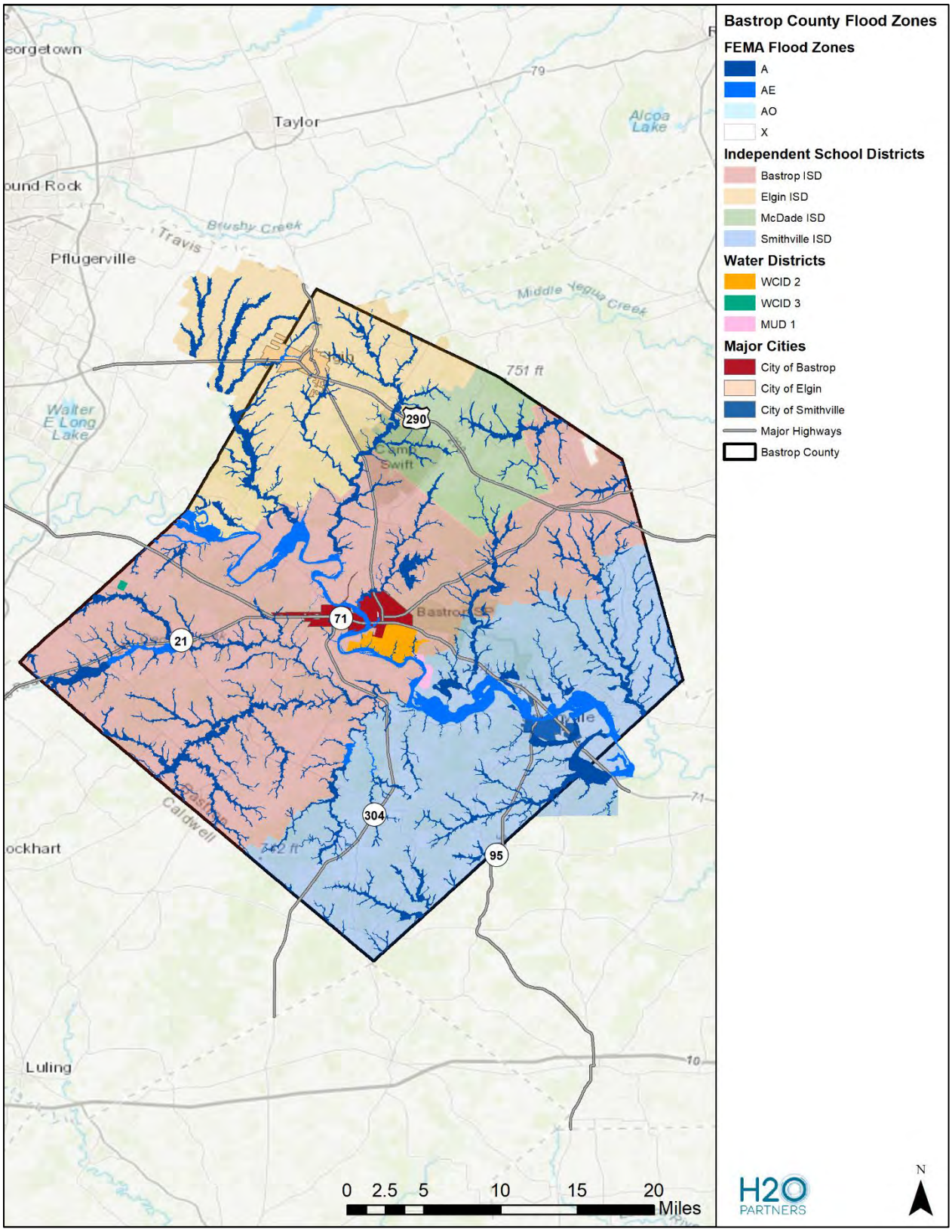


Figure 5-2. Estimated Flood Zones in the City of Bastrop

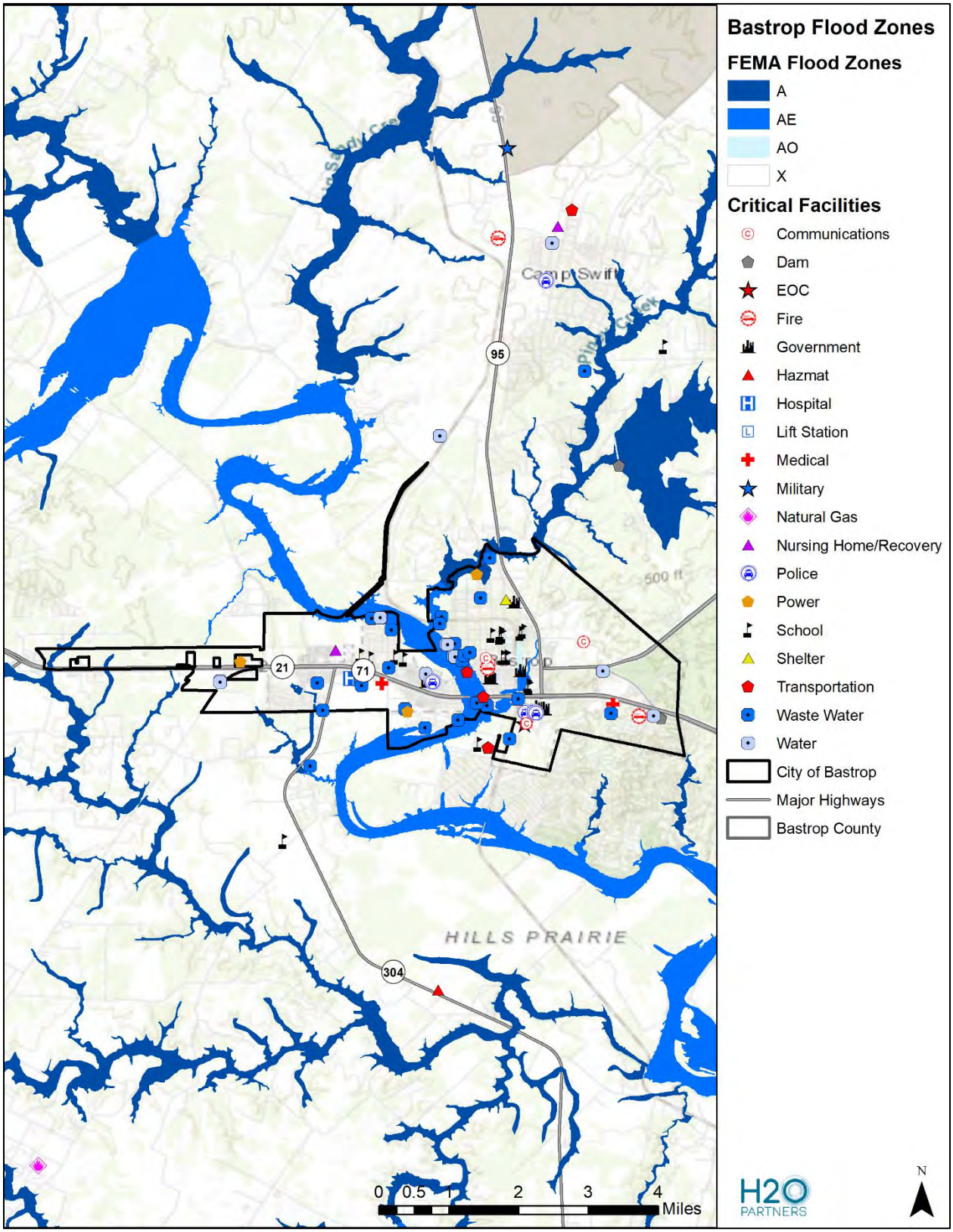


Figure 5-3. Estimated Flood Zones in the City of Elgin

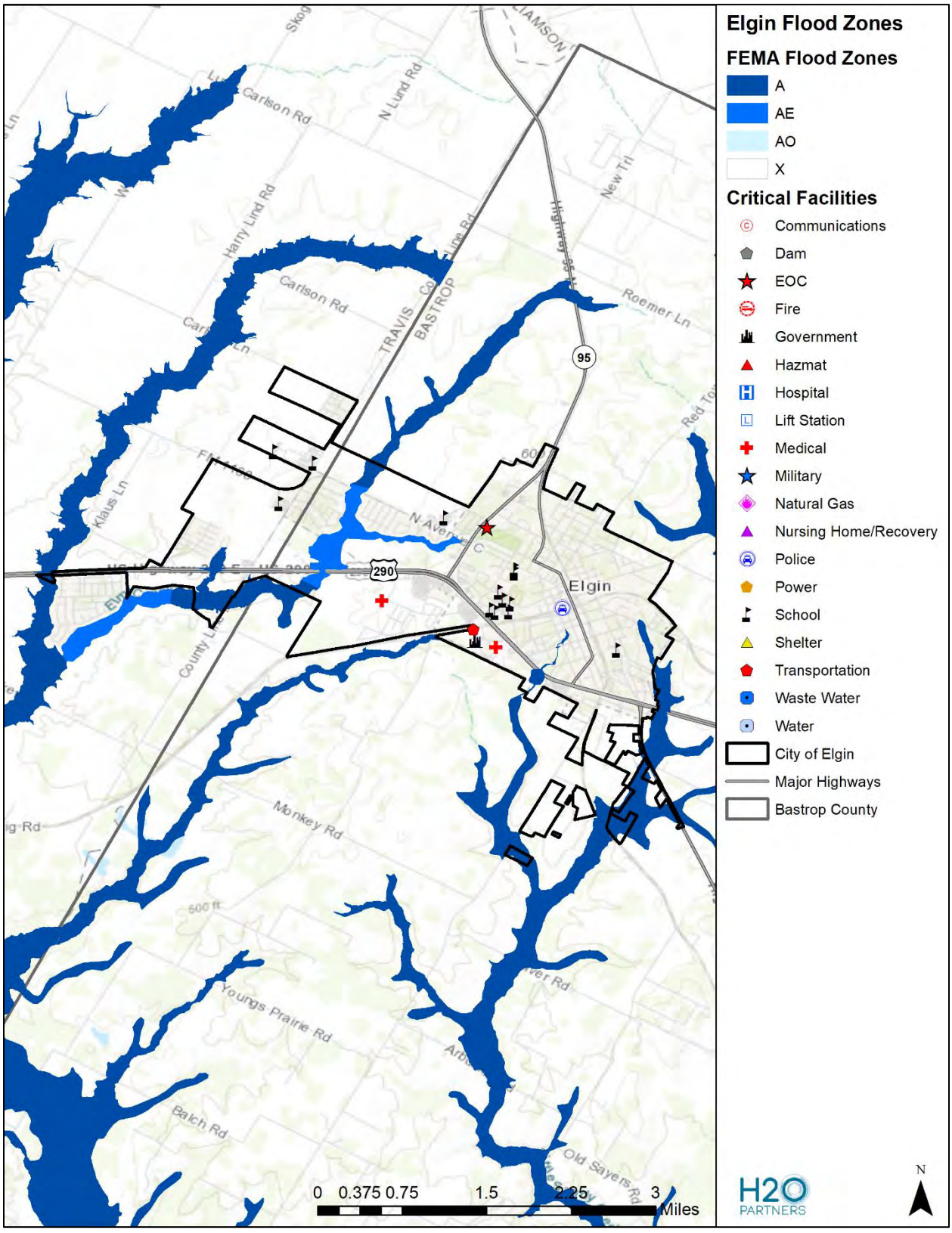


Figure 5-4. Estimated Flood Zones in the City of Smithville

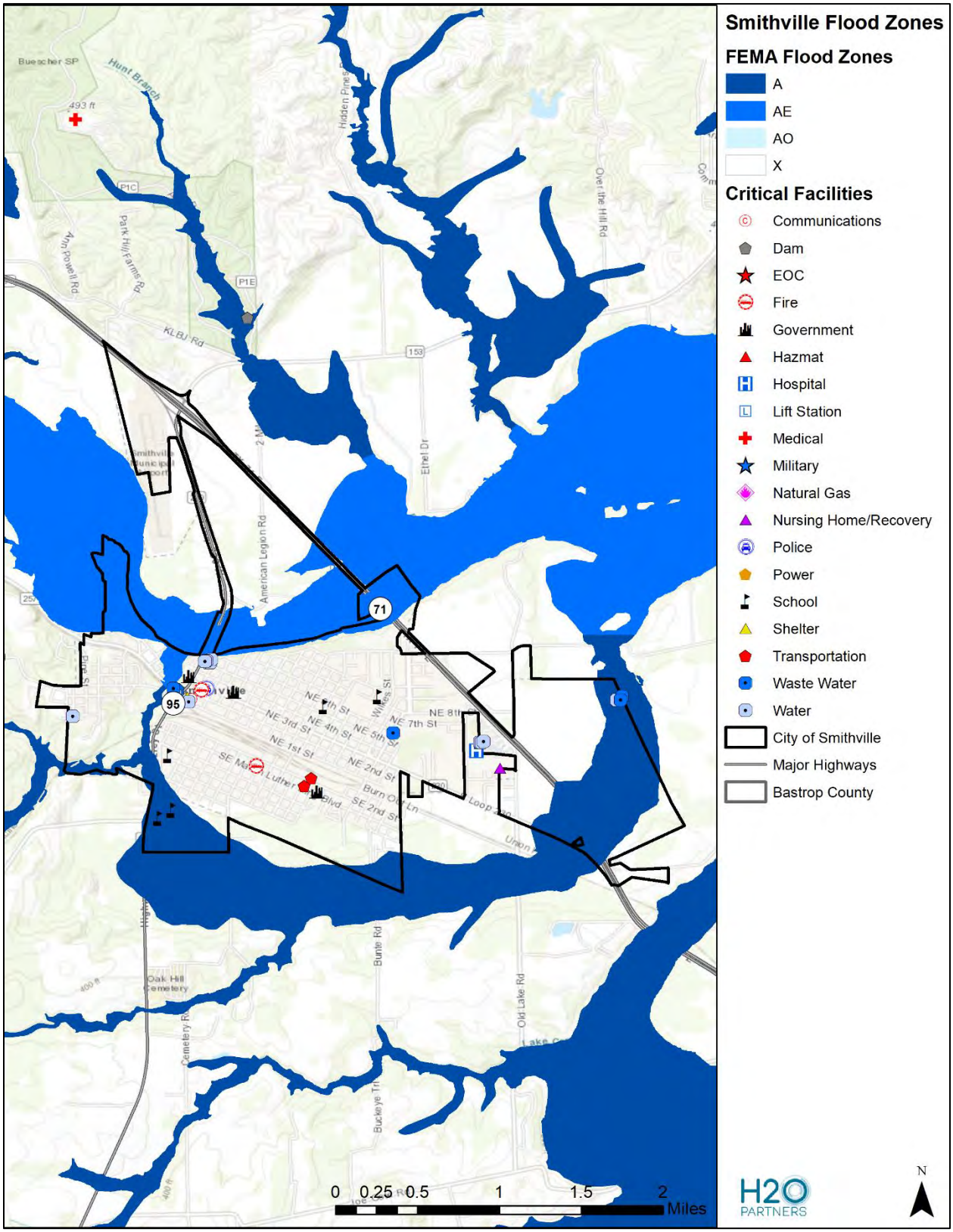


Figure 5-5. Estimated Flood Zones in the Bastrop ISD

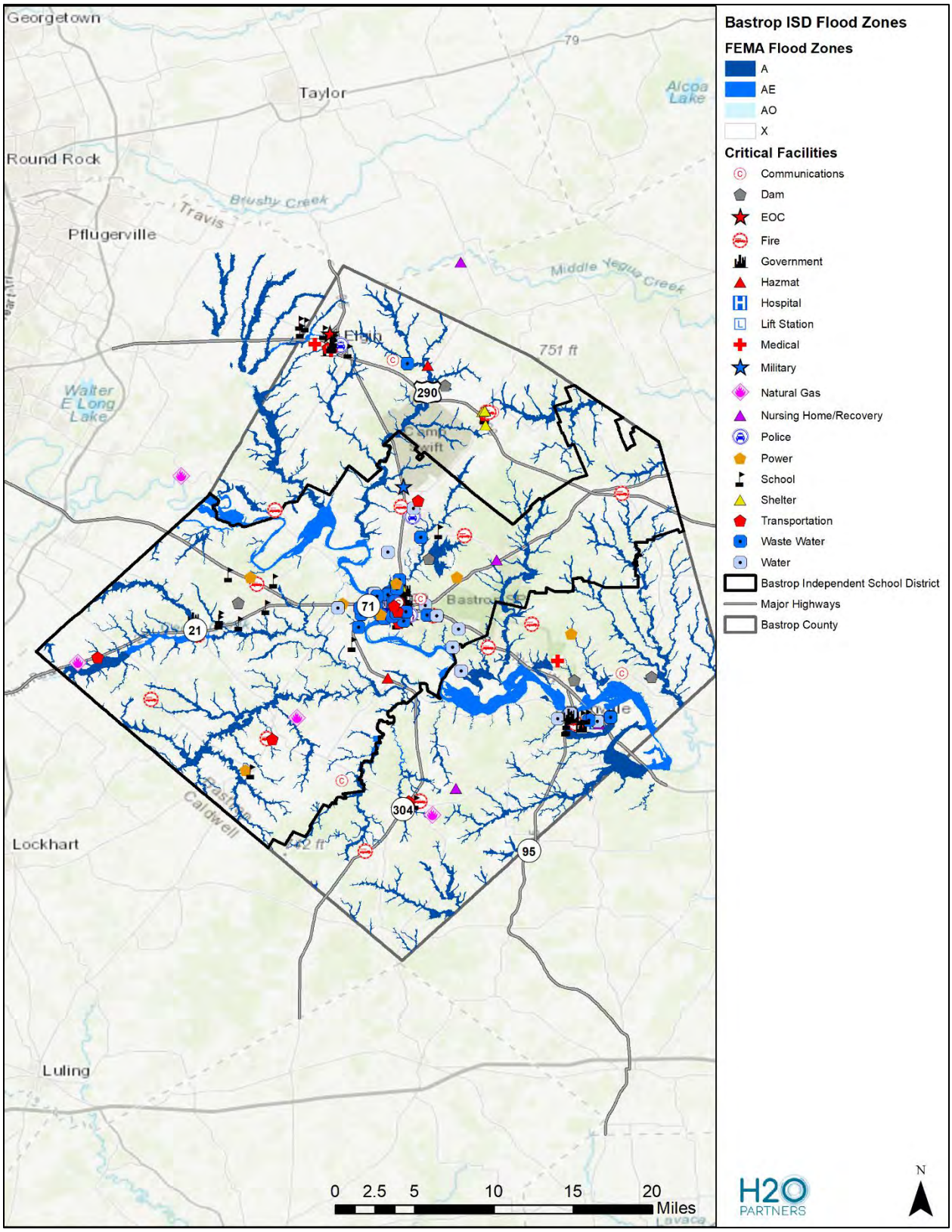


Figure 5-6. Estimated Flood Zones in the Elgin ISD

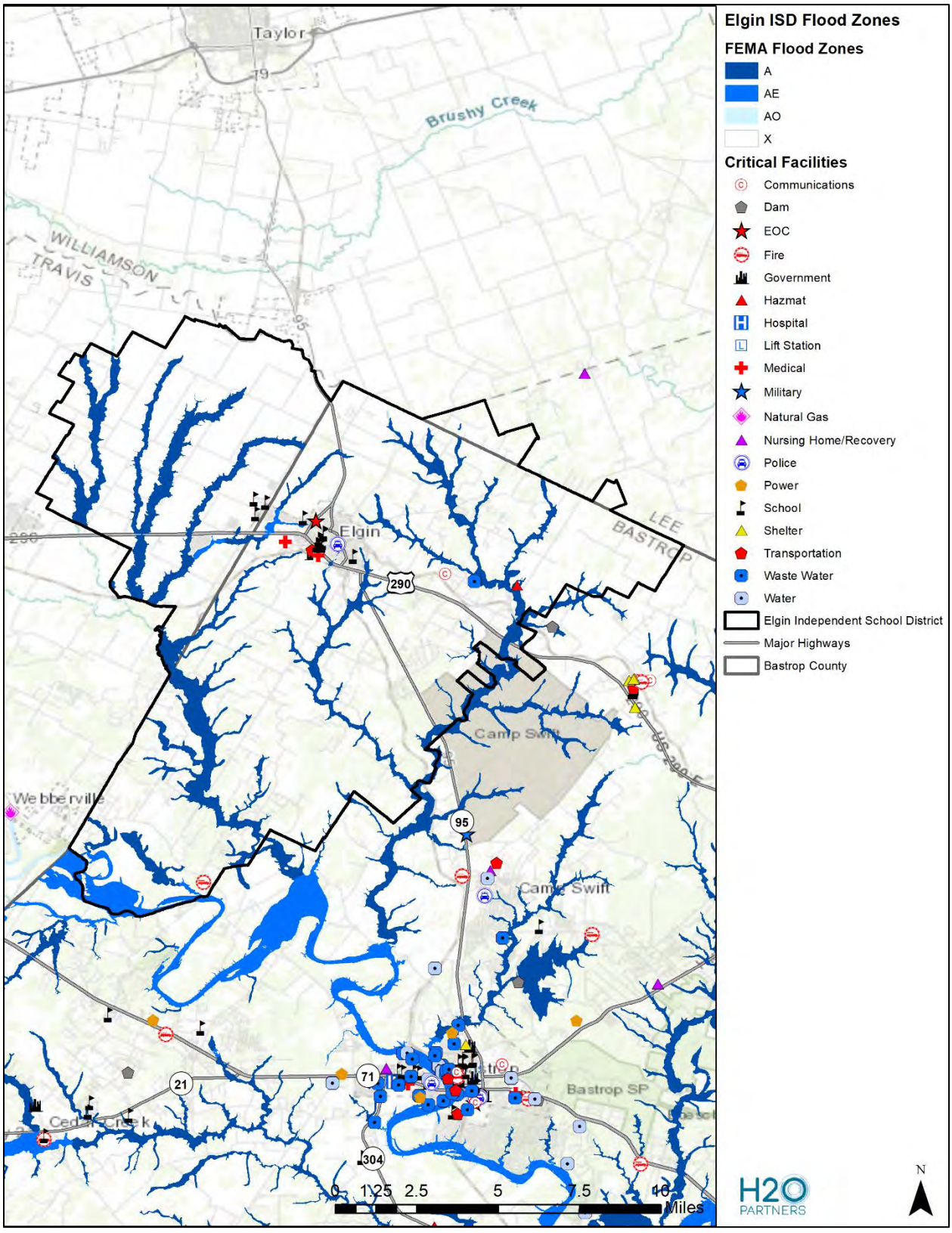


Figure 5-7. Estimated Flood Zones in the McDade ISD

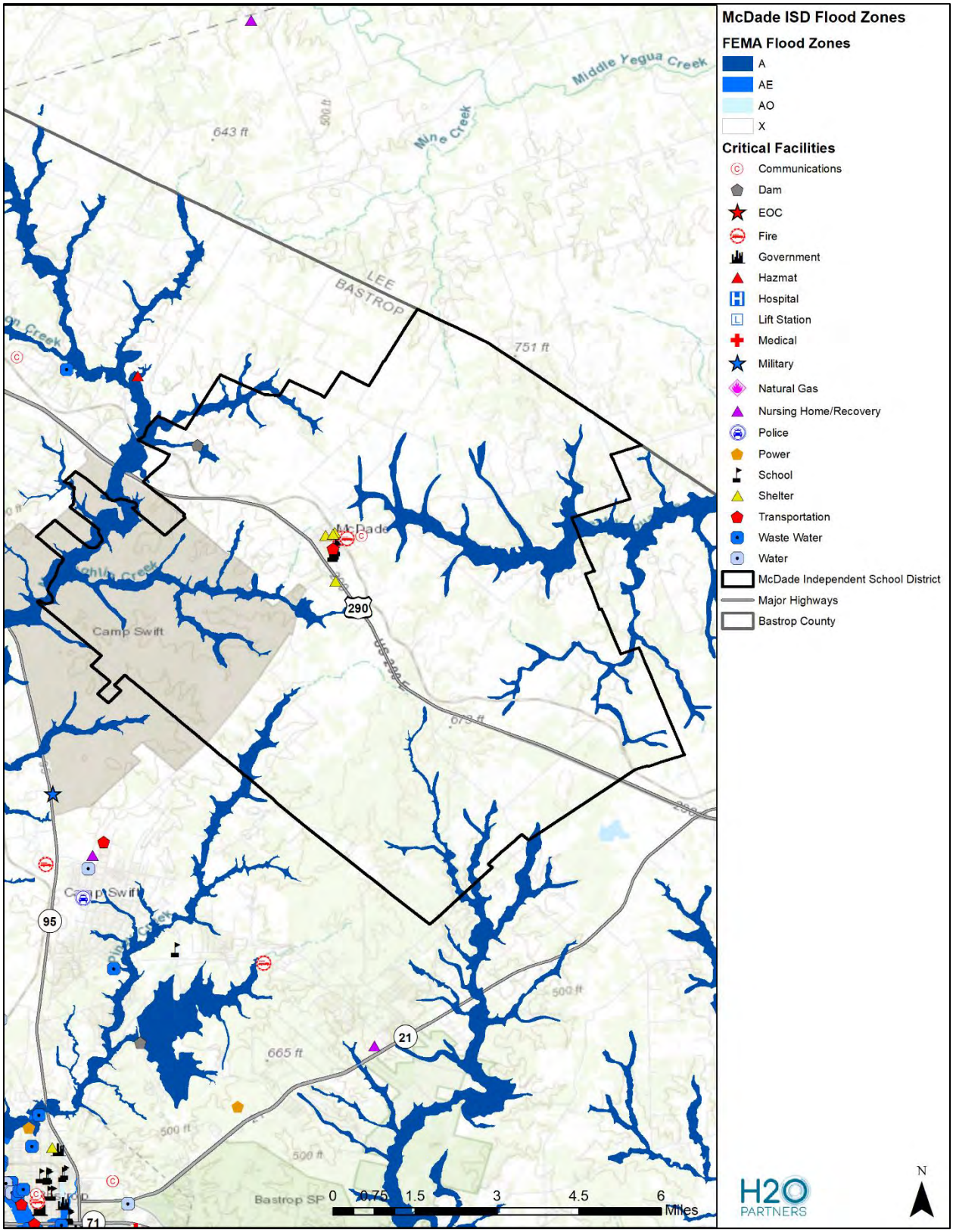


Figure 5-8. Estimated Flood Zones in the Smithville ISD

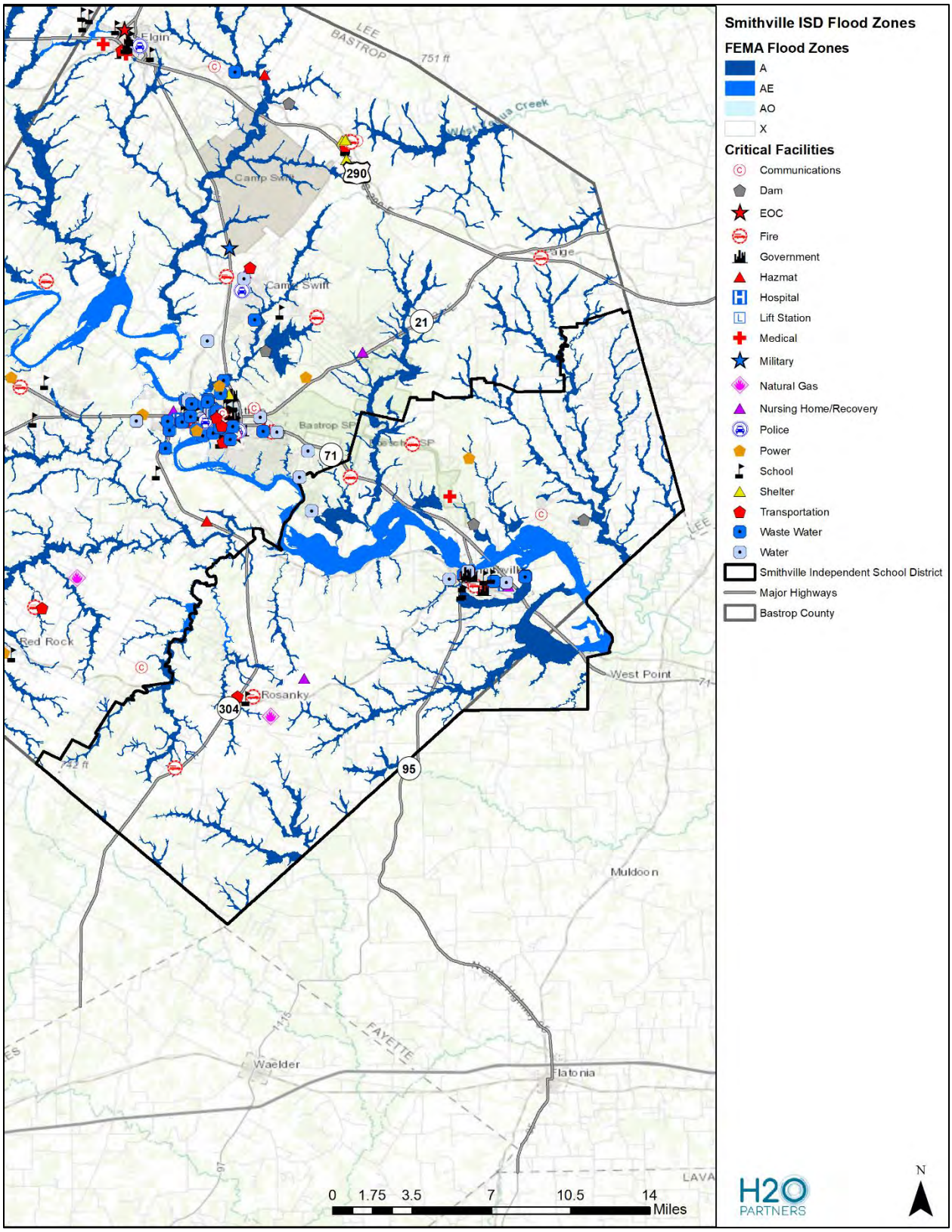


Figure 5-9. Estimated Flood Zones in the Bastrop County MUD #1

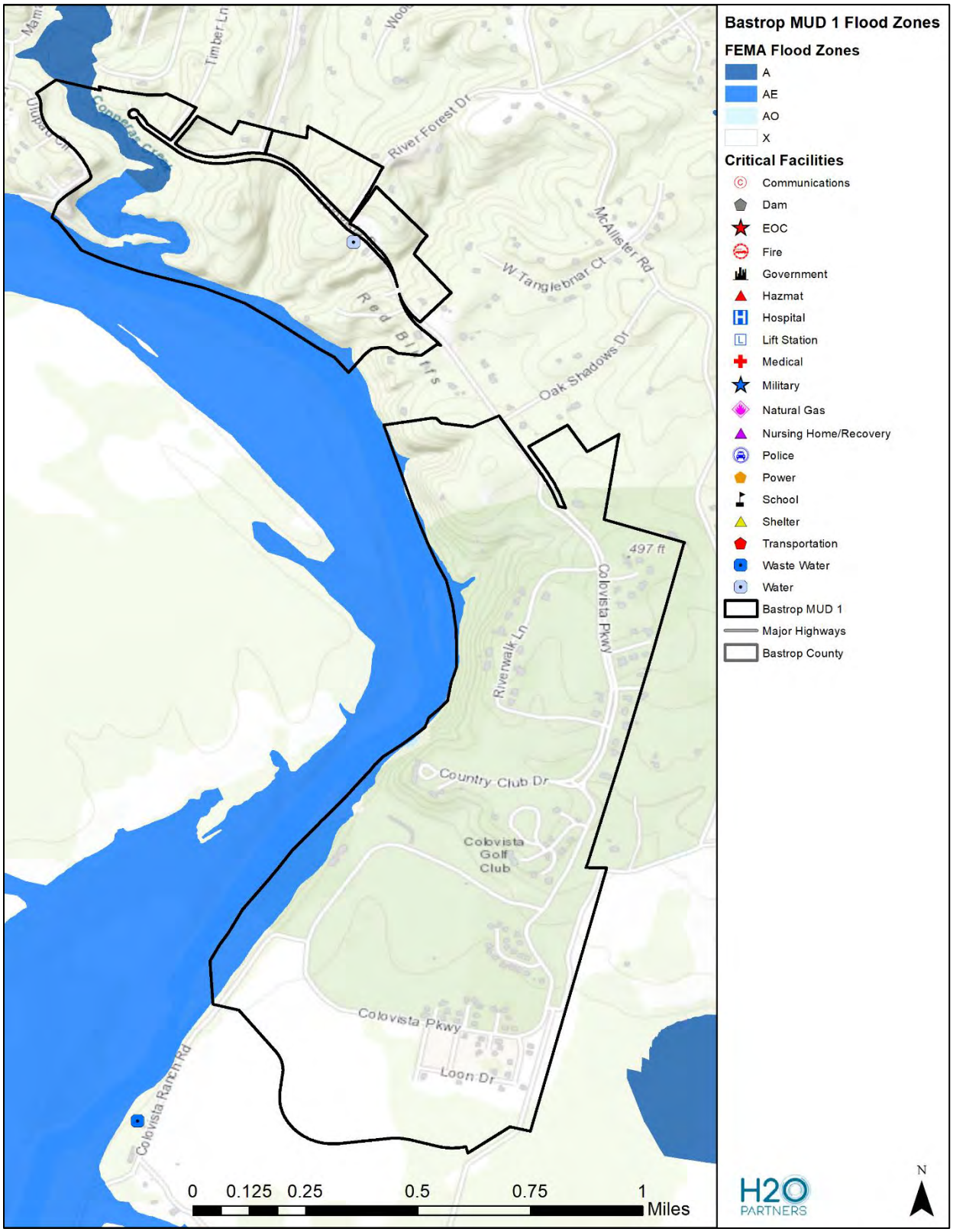


Figure 5-10. Estimated Flood Zones in the Bastrop County WCID #2

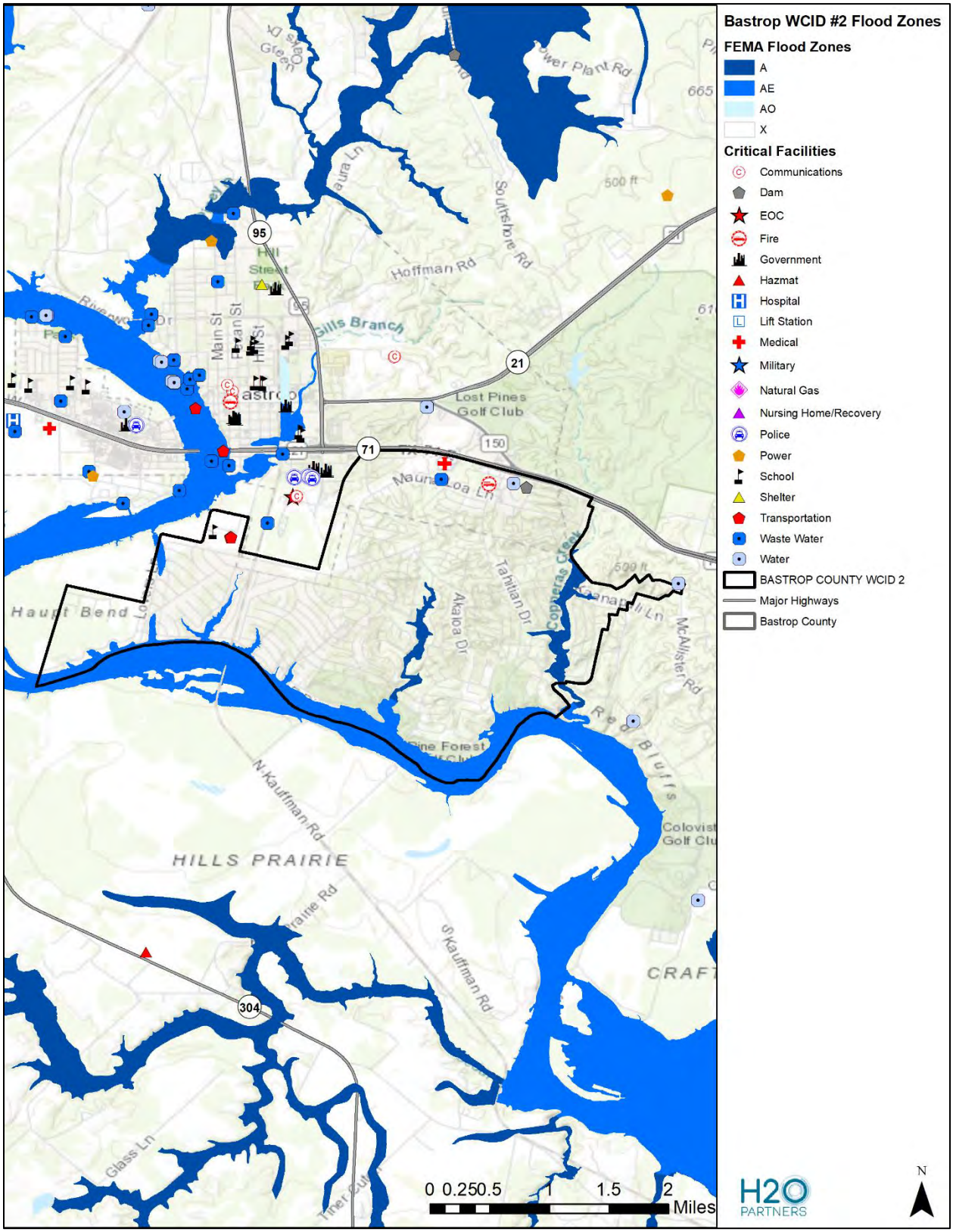
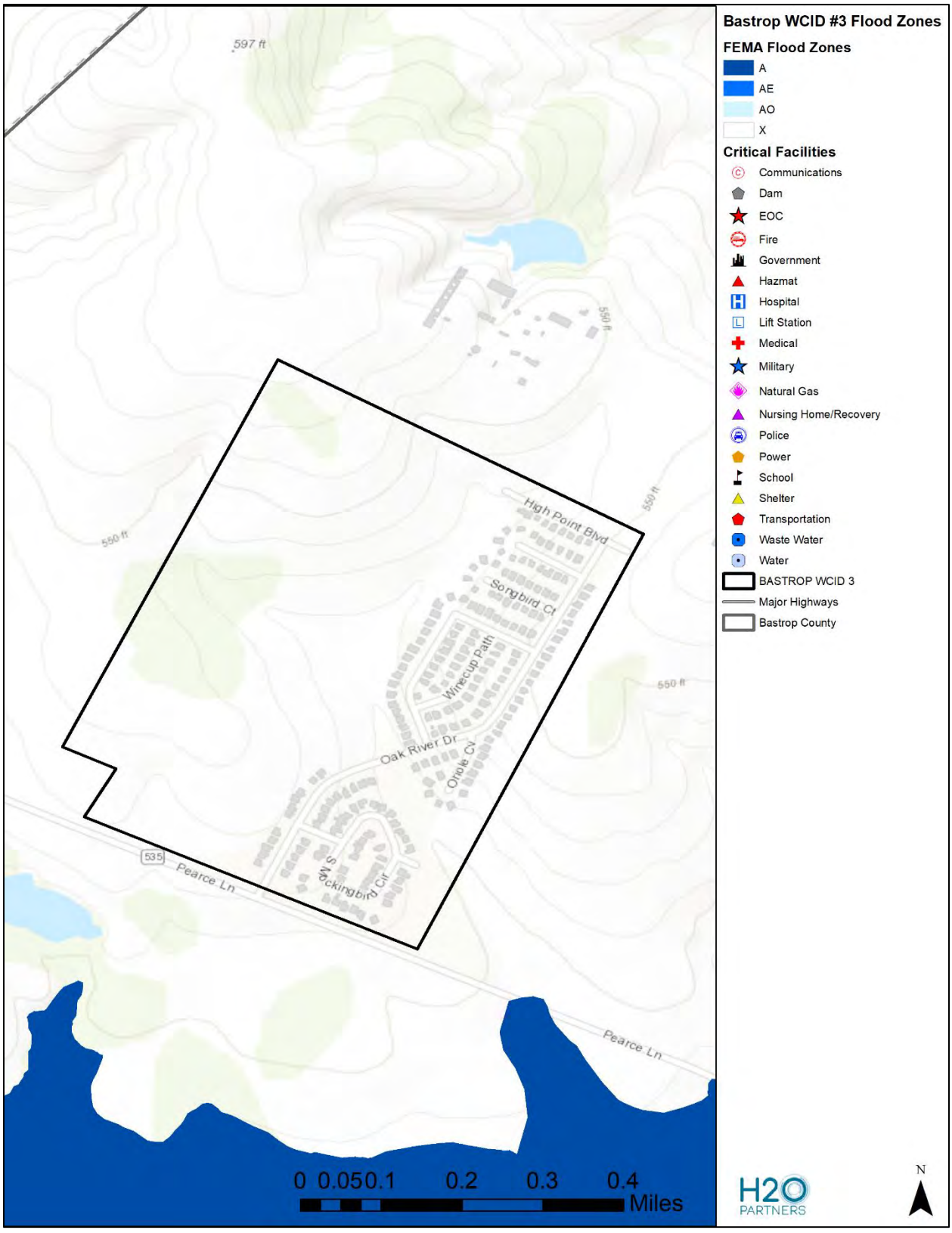


Figure 5-11. Estimated Flood Zones in the Bastrop County WCID #3



EXTENT

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

Determining the intensity and magnitude of a flood event is dependent upon the flood zone and location of the flood hazard area in addition to depths of flood waters. Extent of flood damages can be expected to be more damaging in the areas that will convey a base flood. FEMA categorizes areas on the terrain according to how the area will convey flood water. Flood zones are the categories that are mapped on Flood Insurance Rate Maps. Table 5-1 provides a description of FEMA flood zones and the flood impact in terms of severity or potential harm. Flood Zones A, AE and X are the only hazard areas mapped in the region. Figures 5-1 through 5-11 should be read in conjunction with the extent for flooding in Tables 5-1 and 5-2 to determine the intensity of a potential flood event.

Table 5-1. Flood Zones

INTENSITY	ZONE	DESCRIPTION
HIGH	ZONE A	Areas with a one percent annual chance of flooding and a 26 percent chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas, no depths or base flood elevations are shown within these zones.
	ZONE A1-30	These are known as numbered A Zones (e.g., A7 or A14). This is the base floodplain where the FIRM shows a Base Flood Elevation (BFE) (old format).
	ZONE AE	The base floodplain where base flood elevations are provided. AE Zones are now used on the new format FIRMs instead of A1-A30 Zones.
	ZONE AO	River or stream flood hazard areas and areas with a one percent or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from one to three feet. These areas have a 26 percent chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.
	ZONE AH	Areas with a one percent annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from one to three feet. These areas have a 26 percent chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
	ZONE A99	Areas with a one percent annual chance of flooding that will be protected by a federal flood control system where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones.

INTENSITY	ZONE	DESCRIPTION
	ZONE AR	Areas with a temporarily increased flood risk due to the building or restoration of a flood control system (such as a levee or a dam). Mandatory flood insurance purchase requirements will apply, but rates will not exceed the rates for unnumbered A zones if the structure is built or restored in compliance with Zone AR floodplain management regulations.
HIGH COASTAL	ZONE VE, V1-30	Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26 percent chance of flooding over the life of a 30-year mortgage. No base flood elevations are shown within these zones.
MODERATE to LOW	ZONE X 500	An area inundated by 500-year flooding; an area inundated by 100-year flooding with average depths of less than one foot or with drainage areas less than one square mile; or an area protected by levees from 100-year flooding.

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

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

The intensity and magnitude of a flood event is also determined by the depth of flood waters. Table 5-2 describes the stream gauge data provided by the United States Geological Survey (USGS).

Table 5-2. Extent for Bastrop County[1]

JURISDICTION[2]	PEAK FLOOD EVENT
Bastrop County	Big Sandy Creek near McDade, Bastrop County, Texas reached an overflow elevation of 15.7 feet in May of 1982. The average peak flow for Big Sandy Creek is 12.2 feet at this site.
Bastrop County	Big Sandy Creek near Elgin, Bastrop County, Texas reached an overflow elevation of 21.5 feet in June of 1981. The average peak flow for Big Sandy Creek is 15.3 feet at this site.

[1] Severity estimated by averaging floods at certain stage level over the history of flood events. Severity and peak events are based on U.S. Geological Survey data.
[2] Severity is provided for jurisdictions where peak data was provided.

JURISDICTION[2]	PEAK FLOOD EVENT
City of Bastrop	Colorado River near at Bastrop, Bastrop County, Texas reached an overflow elevation of 57.0 feet in June of 1935. The average peak flow for the Colorado River is 19.3 feet at this site.
City of Smithville	Colorado River at Smithville, Bastrop County, Texas reached an overflow elevation of 42.5 feet in June of 1995. The average peak flow for the Colorado River is 17.5 feet at this site.

The range of flood intensity that the planning area can experience is high, or Zone A. Based on historical occurrences, the planning area, including all participating jurisdictions, ISDs, and special districts, could expect to experience up to 5.0 inches of rainfall within a 4.7-hour period, resulting in flash flooding.

The data described in Tables 5-1 and 5-2, together with Figures 5-1 through 5-11, and historical occurrences for the area, provides an estimated potential magnitude and severity for the County. For example, the City of Bastrop, as shown in Figure 5-2, has areas designated as Zone AE. Reading this figure in conjunction with Table 5-1 means the area is an area of high risk for flood.

HISTORICAL OCCURRENCES

Historical evidence indicates that areas within the planning area, including all participating jurisdictions, ISDs, and special districts, are susceptible to flooding, especially in the form of flash flooding. It is important to note that only flood events that have been reported have been factored into this risk assessment, therefore it is likely that additional flood occurrences have gone unreported before and during the recording period. Table 5-3 identifies historical flood events that resulted in damages, injuries, or fatalities within the Bastrop County planning area, including all participating jurisdictions. Table 5-4 provides the historical flood event summary by jurisdiction. Historical data is provided by the Storm Prediction Center (NOAA), NCEI database for Bastrop County.

Historical flood data for all participating ISDs are provided within the city boundaries for each participating district.

Historical flood data for the MUD #1 are provided within the Bastrop County events per the NCEI database as they do not have events reported separate and apart from the reported county events. MUD #1 reported some moderate damages due to flooding from a single event.

Historical flood data for the WCID #2 are provided within the Bastrop County events per the NCEI database as they do not have events reported separate and apart from the reported county events. WCID #2 reported moderate damages due to flood events including road damages that were repaired with assistance from FEMA and a list station that was submerged.

Historical flood data for the WCID #3 are provided within the Bastrop County events per the NCEI database as they do not have events reported separate and apart from the reported county events. There have been no reported losses as a result of flood for the WCID #3.

Table 5-3. Historical Flood Events, 1996-2021[3]

JURISDICTION	DATE	TIME	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Bastrop County	4/25/1997	2:00 PM	0	0	$16,418	$0
Bastrop County	6/6/1997	4:30 PM	0	0	$8,204	$0
Bastrop County	6/21/1997	11:00 AM	0	0	$8,204	$0
Bastrop County	6/22/1997	2:00 AM	0	0	$8,204	$82,038
Bastrop County	10/17/1998	10:00 AM	0	10	$12,829,951	$80,187
Bastrop County	10/17/1998	10:00 AM	0	100	$4,811,232	$160,374
City of Elgin	5/2/2000	12:30 AM	0	0	$15,336	$0
Bastrop County	11/2/2000	8:30 PM	0	0	$22,661	$0
Bastrop County	11/3/2000	12:00 PM	0	0	$15,107	$0
Bastrop County	11/23/2000	10:30 PM	0	0	$7,554	$0
Bastrop County	5/6/2001	10:30 PM	0	0	$14,801	$0
Bastrop County	11/15/2001	6:00 PM	0	5	$118,608	$0
Bastrop County	4/8/2002	3:00 AM	1	0	$29,256	$0
Bastrop County	10/9/2002	12:30 AM	0	0	$43,521	$0
Bastrop County	11/5/2002	5:15 AM	1	0	$0	$0
Bastrop County	12/4/2002	4:30 AM	0	0	$14,539	$0
Bastrop County	2/20/2003	10:00 AM	0	0	$14,365	$0
Bastrop County	6/13/2003	8:00 PM	0	0	$7,159	$0
Bastrop County	1/16/2004	7:00 PM	0	0	$4,260	$0
Bastrop County	6/20/2007	10:00 AM	0	0	$37,871	$0
City of Elgin	5/6/2015	1:06 AM	0	0	$11,060	$0
City of Bastrop	5/25/2015	6:13 PM	0	0	$2,212,014	$0
Bastrop County	10/30/2015	2:00 PM	0	0	$2,322,292	$0
City of Bastrop	8/27/2017	2:00 PM	0	0	$1,606,886	$0
TOTALS			**2**	**115**	**$24,179,502**	**$322,599**

[3] Only recorded events with fatalities, injuries, and/or damages are listed, values are in 2021 dollars. Historical events are reported from January 1996 through September 2021.

Table 5-4. Summary of Historical Flood Events, January 1996-2021

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Bastrop County[4]	62	1	115	$20,334,206	$322,599
City of Bastrop[5]	15	1	0	$3,818,900	$0
City of Elgin[6]	12	0	0	$26,396	$0
City of Smithville[7]	11	0	0	$0	$0
TOTAL LOSSES	**100**	**2**	**115**	**$24,502,101**	

Based on the list of historical flood events for the Bastrop County planning area (listed above) 39 of the events have occurred since the 2016 Plan.

SIGNIFICANT EVENTS

October 17, 1998 – Bastrop County/All Participating Jurisdictions

Downstream in and near Martindale in Caldwell County, the San Marcos River flooded several subdivisions. In Luling, the river gauge appears to have hung at 38.7 feet and rising, where flood stage is 20 feet. This event broke rainfall records across South Central Texas, producing 18 floods of record in South Central Texas streams and is referred to as the Great October Flood. Damage and destruction to livestock and agriculture, roads and bridges and both public and property and buildings significantly exceeded that of previous flooding. Tens of thousands of livestock were killed, as nearly 3,000 homes were destroyed and approximately another 8,000 homes were damaged. Nearly 1,000 mobile homes were destroyed and another 3,000 were damaged. Twenty-five people drowned as a direct result of the flooding in October in South Central Texas. Four of the six Bastrop County deaths were associated with vehicles as well. Two deaths in Bastrop County and one in Guadalupe County occurred as residents were swept by flood waters from their homes.

November 5, 2002 – Bastrop County

A Bastrop woman was swept away in her car as she attempted to drive through the Cedar Creek crossing at Lower Red Rock Road. She called police to say that she had driven into deep water and the car was beginning to flood. She was rescued by emergency personnel but died shortly afterward at the Smithville hospital.

PROBABILITY OF FUTURE EVENTS

Based on recorded historical occurrences and extent within the Bastrop County planning area, including all participating jurisdictions, ISDs, and special districts, flooding is highly likely and an event will likely occur within the next year. The Smithville ISD, McDade ISD, Bastrop ISD, and WCID #3 facilities have no history of flood events and events directly impacting these entities is

[4] Includes McDade ISD, MUD #1, WCID #2, and WCID #3.
[5] Includes the Bastrop ISD.
[6] Includes the Elgin ISD.
[7] Includes the Smithville ISD.

unlikely. Elgin ISD reported some minor flood damage at the high school field house from a single event. MUD #1 reported some moderate damages due to flooding from a single event. WCID #2 also reported moderate damages due to flood events including road damages that were repaired with assistance from FEMA and a list station that was submerged. While the probability for a flood event for all participating entities highly likely, damages to ISD or special district facilities is unlikely.

VULNERABILITY AND IMPACT

A property's vulnerability to a flood depends on its location and proximity to the floodplain. Structures that lie along banks of a waterway are the most vulnerable and are often repetitive loss structures. The County and all participating jurisdictions encourage development outside of the floodplain, and the impact for flood for the entire planning area is limited as facilities and services would be shut down for 24 hours or less, depending on the scale of the storm.

Table 5-5 includes the critical facilities identified in Appendix C that were determined to be located within the SFHA by FIRM mapping and further by each participating jurisdiction.

Table 5-5. Critical Facilities in the Floodplain by Jurisdiction

JURISDICTION	CRITICAL FACILITIES
Bastrop County	3 Fire Station Facilities, 1 Hazardous Material Facility, 1 DOT Program Facility
City of Bastrop	2 Bridges, 1 Government Facility, 1 Electric Substation, 3 Wastewater Lift Stations, 1 Wastewater Treatment Facility, 7 Water Well Facilities
City of Elgin	None
City of Smithville	2 Wastewater Treatment Facilities, 1 Water Storage Facility
Bastrop ISD	None
Elgin ISD	None
McDade ISD	None
Smithville ISD	2 School Campus Locations (All facilities including schools, administration facilities, and maintenance and operations facilities)
Bastrop County MUD #1	Pipeline Infrastructure
Bastrop County WCID#2	Pipeline Infrastructure
Bastrop County WCID#3	None

Historic loss estimates due to flood are presented in Table 5-6 below. Considering 100 flood events over a 26-year period, frequency is approximately three to four events every year.

Annualized losses are not included for the McDade ISD or the Smithville ISD as there have not been events or losses to affect either Independent School District's separate and apart from

historical occurrences within the planning area. Similarly, annualized losses are not provided for MUD #1 as they are not available or have not been reported separate and apart from historical occurrences based on their respective locations.

Table 5-6. Potential Annualized Losses by Jurisdiction

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Bastrop County	$20,334,206	$782,085
City of Bastrop	$3,818,900	$146,881
City of Elgin	$26,396	$1,015
City of Smithville	$0	$0
Bastrop ISD	$0	$0
Elgin ISD[8]	$888	$34
McDade ISD	$0	$0
Smithville ISD	$0	$0
Bastrop County MUD #1	$0	$0
Bastrop County WCID #2[9]	$134,250	$5,370
Bastrop County WCID #3[10]	$345,525	$5,163
Planning Area	**$24,660,165**	**$948,468**

The severity of a flooding event varies depending on the relative risk to citizens and structures located within each city. Table 5-7 depicts the level of impact for Bastrop County including all participating jurisdictions, ISDs, and special districts.

Table 5-7. Impact by Jurisdiction

JURISDICTION	IMPACT	DESCRIPTION
Bastrop County	Substantial	It is anticipated that Bastrop County could anticipate an impact of "Limited" with critical facilities shut down for 24-hours or less and less than 10 percent of property would be destroyed or damaged. However, the historical number of fatalities and injuries indicates a "substantial" impact, with multiple fatalities possible depending on the size of the event.

[8] Reported damages provided by the Elgin ISD
[9] Reported damages provided by the WCID #2
[10] Reported damages provided by the WCID #3

City of Bastrop	Substantial	It is anticipated that the City of Bastrop could anticipate an impact of “Limited” with critical facilities shut down for 24-hours or less and less than 10 percent of property would be destroyed or damaged. However, the historical fatality indicates a “substantial” impact, with multiple fatalities possible depending on the size of the event.
City of Elgin	Limited	It is anticipated that the City of Elgin could anticipate an impact of “limited” with critical facilities would be shut down for 24 hours or less and less than 10 percent of property would be destroyed or damaged.
City of Smithville	Limited	It is anticipated that the City of Smithville could anticipate an impact of “limited” with critical facilities would be shut down for 24 hours or less and less than 10 percent of property would be destroyed or damaged.
Bastrop ISD	Limited	It is anticipated that the Bastrop ISD could anticipate an impact of “limited” with critical facilities would be shut down for 24 hours or less and less than 10 percent of property would be destroyed or damaged.
Elgin ISD	Limited	It is anticipated that the Elgin ISD could anticipate an impact of “limited” with critical facilities would be shut down for 24 hours or less and less than 10 percent of property would be destroyed or damaged.
McDade ISD	Limited	It is anticipated that the McDade ISD could anticipate an impact of “limited” with critical facilities would be shut down for 24 hours or less and less than 10 percent of property would be destroyed or damaged.
Smithville ISD	Limited	It is anticipated that the Smithville ISD could anticipate an impact of “limited” with critical facilities would be shut down for 24 hours or less and less than 10 percent of property would be destroyed or damaged.
Bastrop County MUD #1	Limited	It is anticipated that the Bastrop County MUD #1could anticipate an impact of “limited” with critical facilities would be shut down for 24 hours or less and less than 10 percent of property would be destroyed or damaged.
Bastrop County WCID #2	Limited	It is anticipated that the Bastrop County WCID #2 could anticipate an impact of “limited” with critical facilities would be shut down for 24 hours or less and less than 10 percent of property would be destroyed or damaged.
Bastrop County WCID #3	Limited	It is anticipated that the Bastrop County WCID #3 could anticipate an impact of “limited” with critical facilities would be shut down for 24 hours or less and less than 10 percent of property would be destroyed or damaged.

ASSESSMENT OF IMPACTS

Flooding is the deadliest natural disaster that occurs in the U.S. each year, and it poses a constant and significant threat to the health and safety of the people in the Bastrop County planning area. Impacts to the planning area can include:

- Flood-related rescues may be necessary at swift and low water crossings or in flooded neighborhoods where roads have become impassable, placing first responders in harm's way.
- Evacuations may be required for entire neighborhoods because of rising floodwaters, further taxing limited response capabilities and increasing sheltering needs for displaced residents.
- Health risks and threats to residents are elevated after the flood waters have receded due to contaminated flood waters (untreated sewage and hazardous chemicals) and mold growth typical in flooded buildings and homes.
- Significant flood events often result in widespread power outages increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.
- Extended power outage can result in an increase in structure fires and/or carbon monoxide poisoning as individuals attempt to cook or heat their home with alternate, unsafe cooking or heating devices, such as grills.
- Floods can destroy or make residential structures uninhabitable, requiring shelter or relocation of residents in the aftermath of the event.
- First responders are exposed to downed power lines, contaminated and potentially unstable debris, hazardous materials, and generally unsafe conditions, elevating the risk of injury to first responders and potentially diminishing emergency response capabilities.
- Emergency operations and services may be significantly impacted due to damaged facilities.
- Significant flooding can result in the inability of emergency response vehicles to access areas of the community.
- Critical staff may suffer personal losses or otherwise impacted by a flood event and unable to report for duty, limiting response capabilities.
- City or county departments may be flooded, delaying response and recovery efforts for the entire community.
- Private sector entities that the jurisdiction and its residents rely on, such as utility providers, financial institutions, and medical care providers may not be fully operational and may require assistance from neighboring communities until full services can be restored.
- Damage to infrastructure may slow economic recovery since repairs may be extensive and lengthy.
- Some businesses not directly damaged by the flood may be negatively impacted while utilities are being restored or water recedes, further slowing economic recovery.
- When the community is affected by significant property damage it is anticipated that funding would be required for infrastructure repair and restoration, temporary services and facilities, overtime pay for responders, and normal day-to-day operating expenses.
- Displaced residents may not be able to immediately return to work, further slowing economic recovery.
- Residential structures substantially damaged by a flood may not be rebuilt for years and uninsured or underinsured residential structures may never be rebuilt, reducing the tax base for the community.

- Large floods may result in a dramatic population fluctuation, as people are unable to return to their homes or jobs and must seek shelter and/or work outside of the affected area.
- Businesses that are uninsured or underinsured may have difficulty reopening, which results in a net loss of jobs for the community and a potential increase in the unemployment rate.
- Recreation activities such as fishing, boating, and camping activities at locations such as Lake Bastrop or along the Colorado River may be unavailable and tourism can be unappealing for years following a large flood event, devastating directly related local businesses and negatively impacting economic recovery.
- Flooding may cause significant disruptions of clean water and sewer services, elevating health risks and delaying recovery efforts.
- The psycho-social effects on flood victims and their families can traumatize them for long periods of time, creating long term increases in medical treatment and services.
- Extensive or repetitive flooding can lead to decreases in property value for the affected community.
- Flood poses a potential catastrophic risk to annual and perennial crop production and overall crop quality leading to higher food costs.
- Flood related declines in production may lead to an increase in unemployment.
- Large floods may result in loss of livestock, potential increased livestock mortality due to stress and water borne disease, and increased cost for feed.

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

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) PARTICIPATION

Flood insurance offered through the National Flood Insurance Program (NFIP) is the best way for home and business owners to protect themselves financially against the flood hazard. Bastrop County and the participating cities are currently participating in the NFIP and are in good standing. The participating ISDs and special districts are not eligible entities for participation in the NFIP.

Bastrop County, the City of Bastrop, the City of Elgin and the City of Smithville currently have in place minimum NFIP standards for new construction and substantial improvements of structures. These jurisdictions are considering adopting additional higher regulatory NFIP standards to limit floodplain development. Bastrop County is a Community Rating System (CRS) participant and has incorporated higher standards into their flood damage prevention ordinance. The flood hazard areas throughout the planning area are subject to periodic inundation, which may result in loss of life and property, health and safety hazards, disruption of commerce and governmental services, and extraordinary public expenditures for flood protection and relief, of which adversely affect public safety.

These flood losses are created by the cumulative effect of obstructions in floodplains which cause an increase in flood heights and velocities, and by the occupancy of flood hazard areas by uses vulnerable to floods and hazardous to other lands because they are inadequately elevated, flood-

proofed or otherwise protected from flood damage. Mitigation actions are included to address flood maintenance issues as well, including routinely clearing debris from drainage systems and bridges and expanding drainage culverts and storm water structures to more adequately convey flood waters.

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

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

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

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

NFIP COMPLIANCE AND MAINTENANCE

As mentioned, Bastrop County and all of the participating jurisdictions have developed mitigation actions that relate to either NFIP maintenance or compliance. Compliance and maintenance actions can be found in Section 24.

Flooding was identified by the majority of participating communities as a high-risk hazard during hazard ranking activities at the Risk Assessment Workshop. As such, many of the mitigation actions were developed with flood mitigation in mind. A majority of these flood actions address

compliance with the NFIP and implementing flood awareness programs. Participating jurisdictions recognize the need and are working towards adopting higher NFIP regulatory standards to further minimize flood risk in their community. In addition, each jurisdiction is focusing on NFIP public awareness activities. This includes promoting the availability of flood insurance by placing NFIP brochures and flyers in public libraries or public meeting places.

All participating jurisdictions in the NFIP have a designated floodplain administrator. All floodplain administrators in the planning area will continue to maintain compliance with the NFIP including continued floodplain administration, zoning ordinances, and development regulation. The floodplain ordinance adopted by each participating jurisdiction outlines the minimum requirements for development in special flood hazard areas.

REPETITIVE LOSS

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

Repetitive Loss properties are defined as structures that are:

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

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

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

In either scenario, at least two of the referenced claims must have occurred within any ten-year period and must be greater than 10 days apart.[11] Table 5-8 shows repetitive loss and severe repetitive loss properties for each participating jurisdiction in the planning area. It is noted that unincorporated Bastrop County and the City of Elgin currently have no repetitive loss properties.

[11] Source: Texas Water Development Board

Table 5-8. Repetitive Loss and Severe Repetitive Loss Properties

JURISDICTION	BUILDING TYPE	NUMBER OF STRUCTURES	NUMBER OF LOSSES
City of Bastrop	Single Family	4	12
City of Smithville	Single Family	1	2

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Probability of Future Events 28
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HAZARD DESCRIPTION

A wildfire event can rapidly spread out of control and occurs most often in the summer when the brush is dry and flames can move unchecked through a highly vegetative area. Wildfires can start as a slow burning fire along the forest floor, killing and damaging trees. The fires often spread more rapidly as they reach the tops of trees with wind carrying the flames from tree to tree. Usually, dense smoke is the first indication of a wildfire.

A wildfire event often begins unnoticed and spreads quickly, lighting brush, trees, and homes on fire. For example, a wildfire may be started by a campfire that was not doused properly, a tossed cigarette, burning debris, or arson.

Texas has seen a significant increase in the number of wildfires in the past 30 years, which included wildland, interface, or intermix fires. Wildland fires are fueled almost exclusively by natural vegetation, while interface or intermix fires are urban/wildland fires in which vegetation and the built-environment provide the fuel.

LOCATION

A wildfire event can be a potentially damaging consequence of drought. Wildfires can vary greatly in terms of size, location, intensity, and duration. While wildfires are not confined to any specific geographic location, they are most likely to occur in open grasslands. The threat to people and property from a wildfire event is greater in the fringe areas where developed areas meet open grass lands, such as the WUI. (Figures 6-1 through 6-11). It is estimated that 87.2 percent of the total population in Bastrop County live within the WUI. However, the entire Bastrop County planning area is at risk for wildfires.

Figure 6-1. Wildland Urban Interface Map – Bastrop County

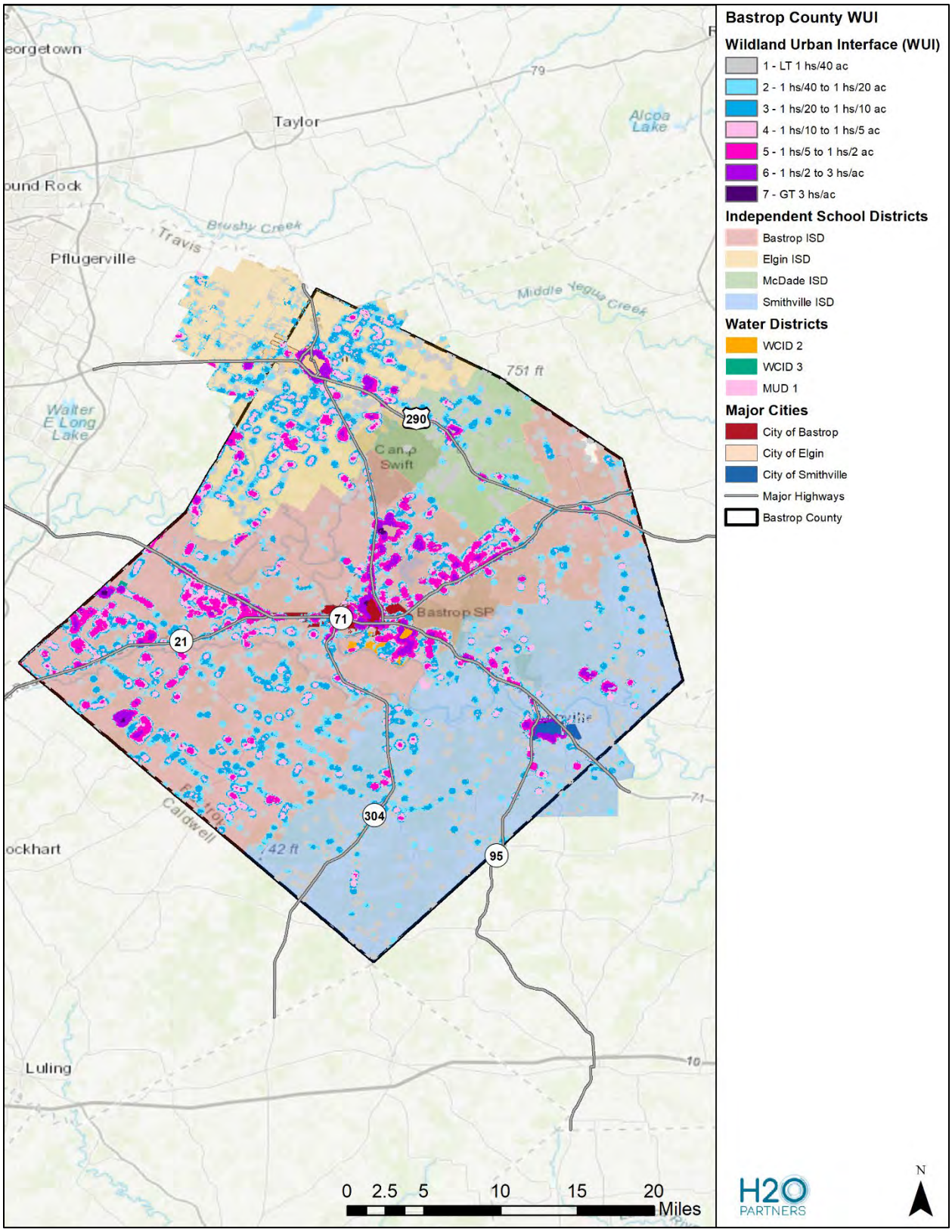
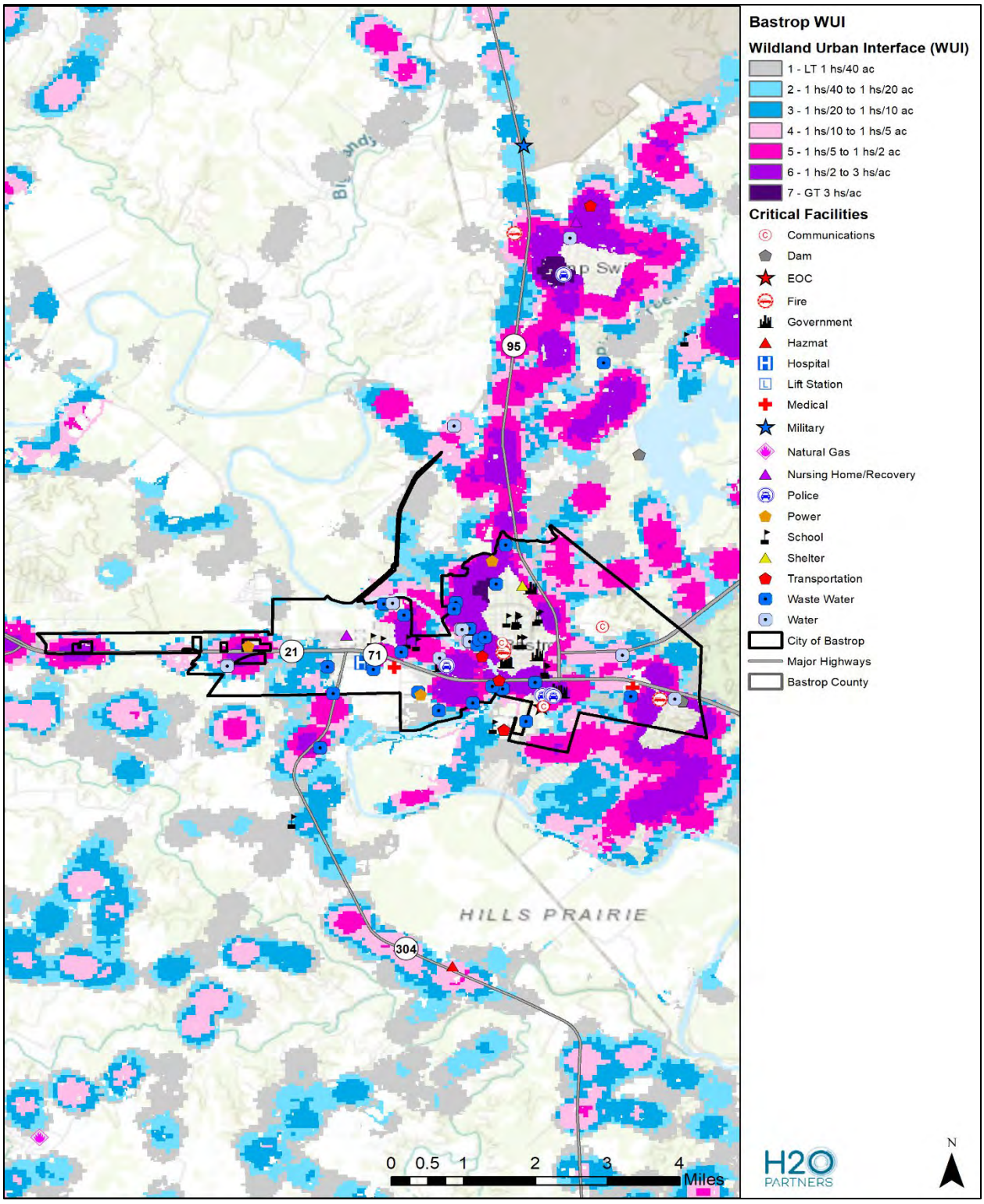
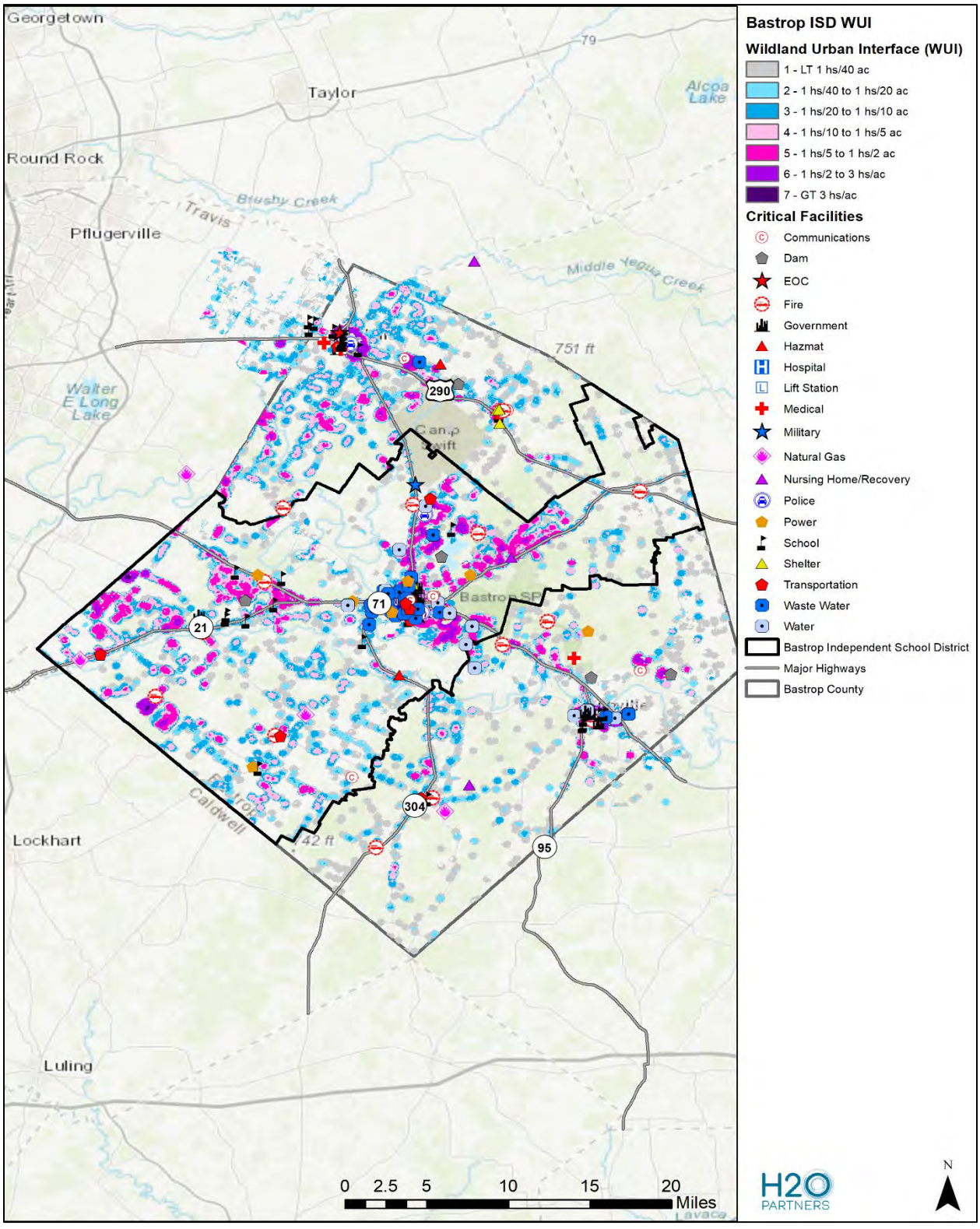


Figure 6-2. Wildland Urban Interface Map – City of Bastrop



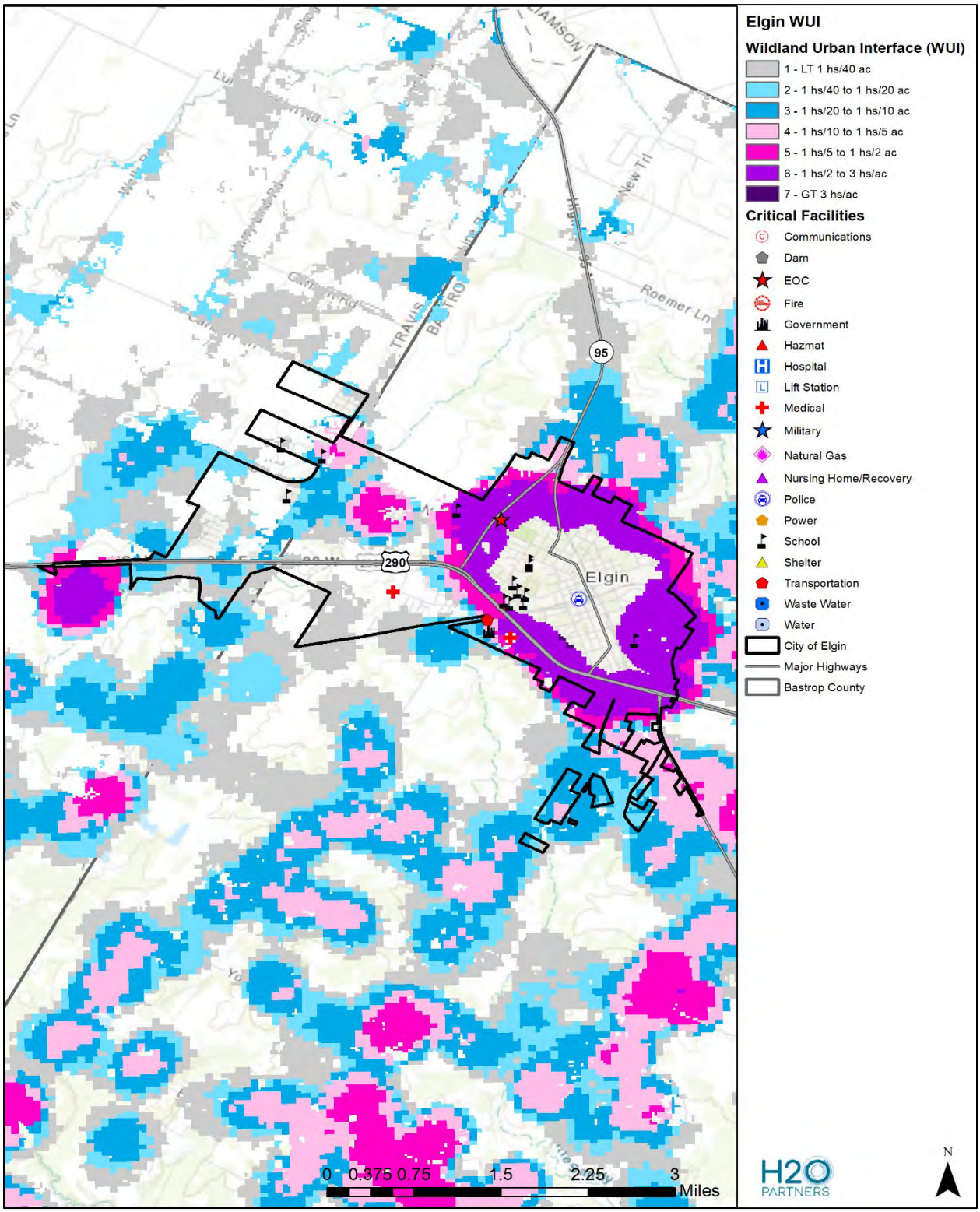
It is estimated that 63.3 percent of the total population in the City of Bastrop live within the WUI. However, the entire City of Bastrop is at some risk for wildfires.

Figure 6-3. Wildland Urban Interface Map –Bastrop ISD



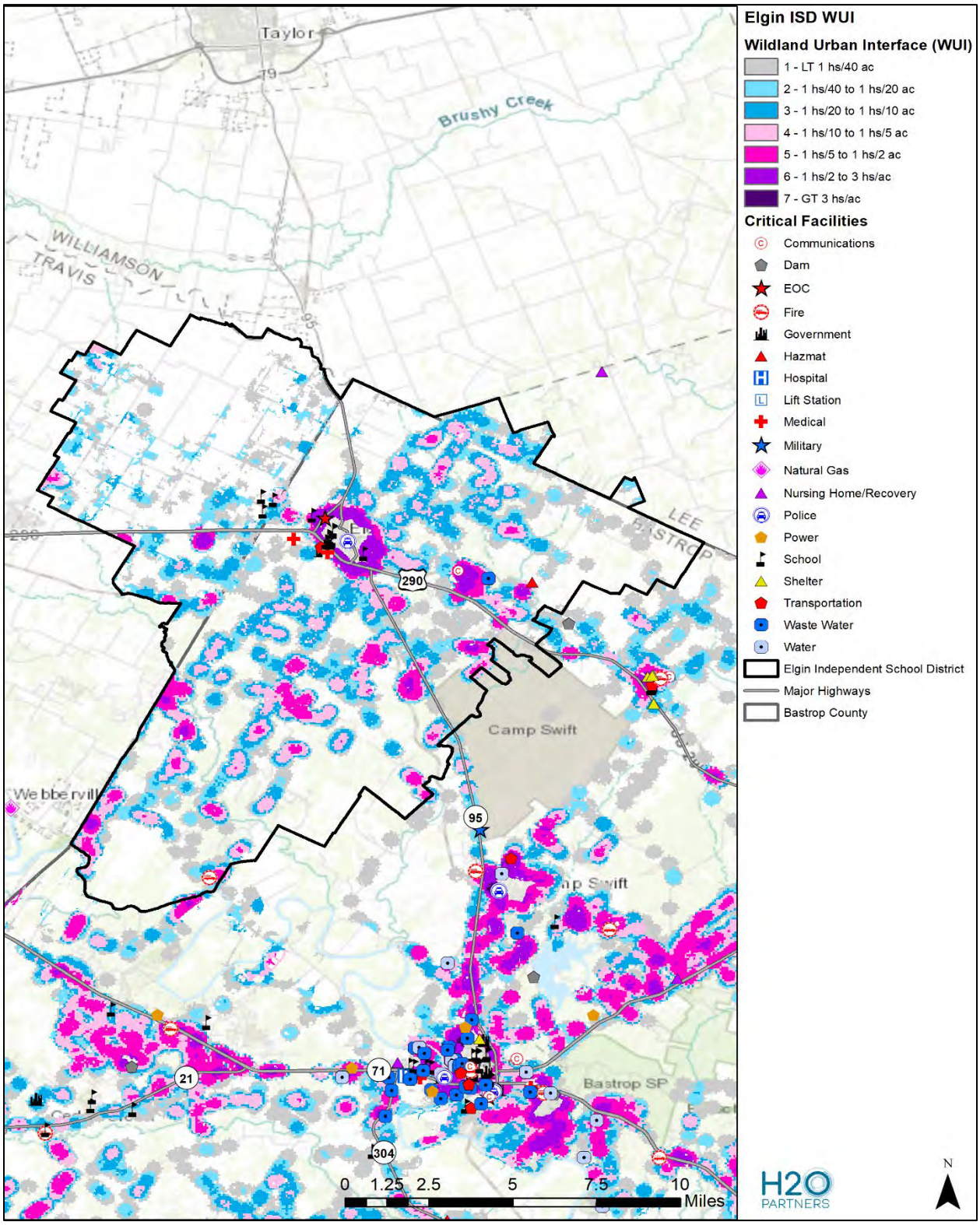
Nine of the Bastrop ISD facilities are located within the WUI. However, all Bastrop ISD facilities are at some risk for wildfires.

Figure 6-4. Wildland Urban Interface Map – City of Elgin



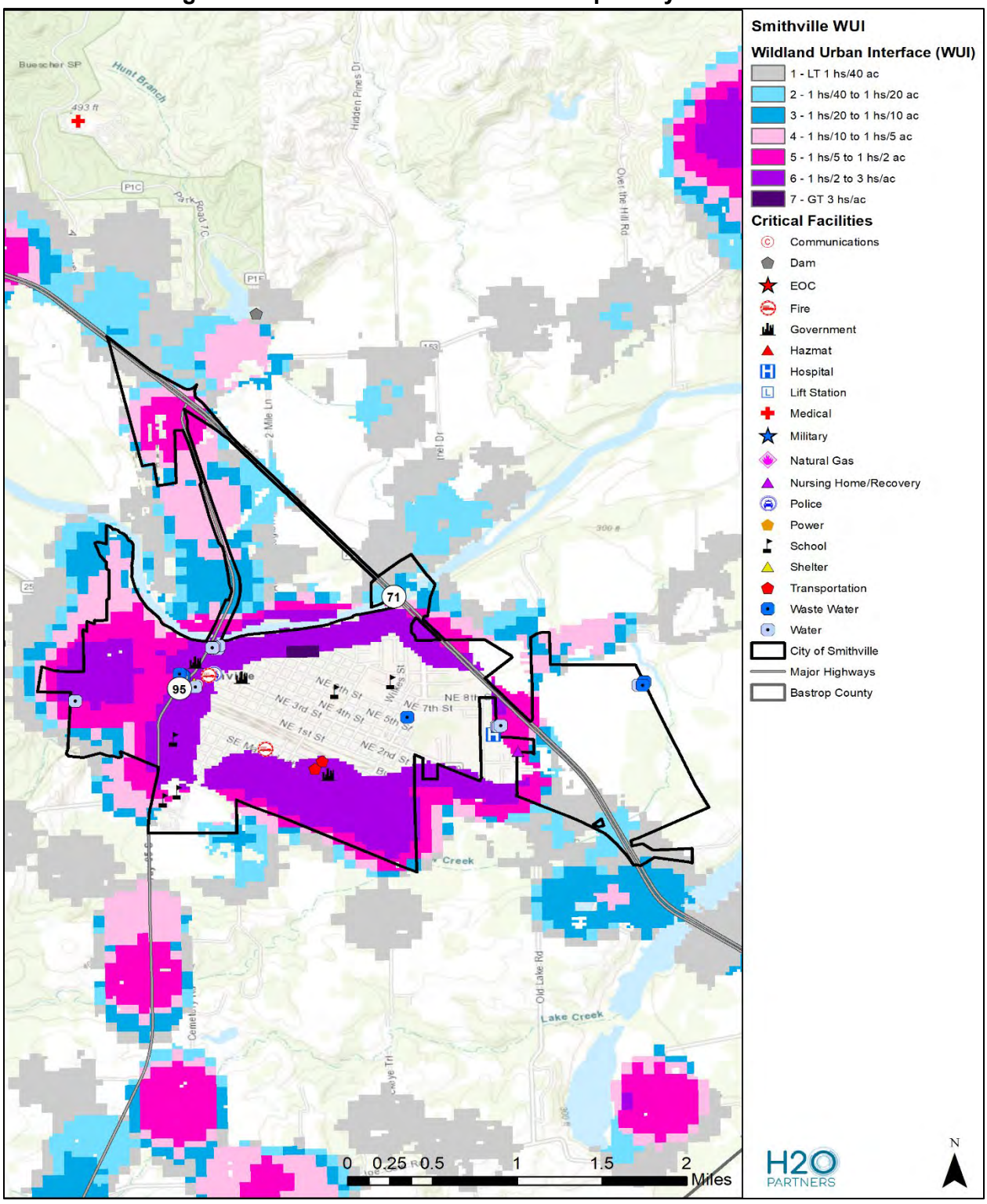
It is estimated that 59.3 percent of the total population in the City of Elgin live within the WUI. However, the entire City of Elgin is at some risk for wildfires.

Figure 6-5. Wildland Urban Interface Map – Elgin ISD



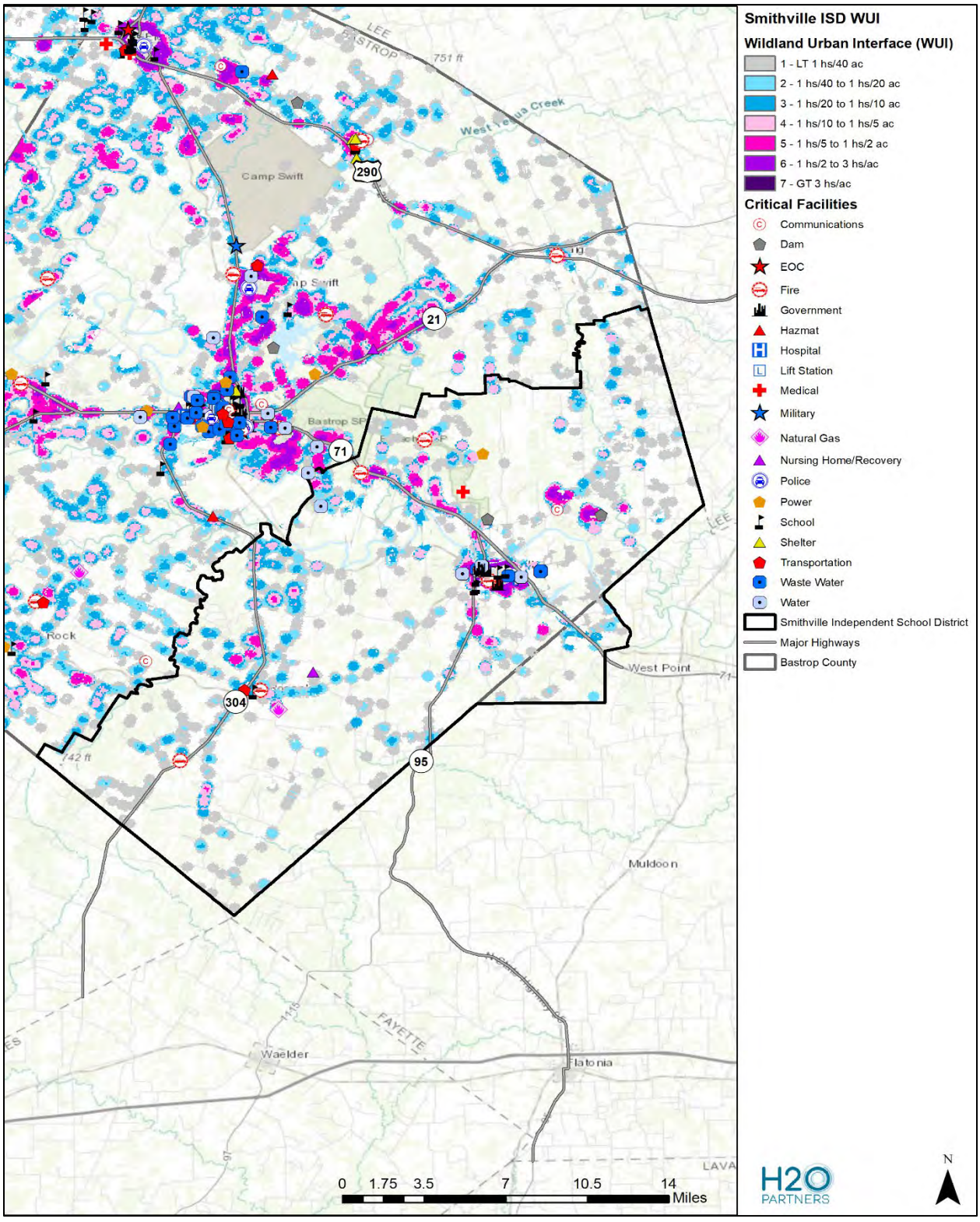
Four of the Elgin ISD facilities are located within the WUI. However, all Elgin ISD facilities are at some risk for wildfires.

Figure 6-6. Wildland Urban Interface Map – City of Smithville



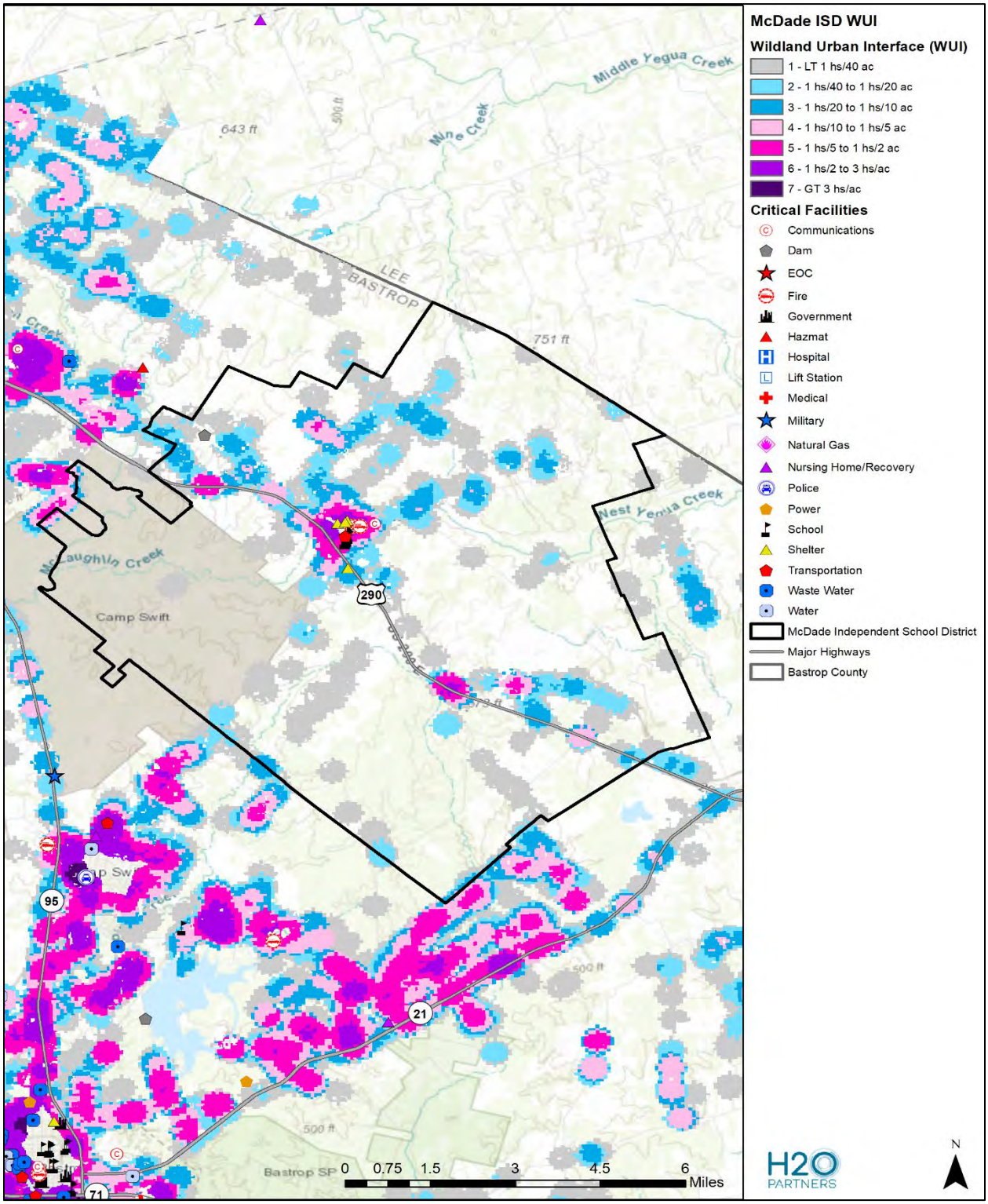
It is estimated that 44.5 percent of the total population in the City of Smithville live within the WUI. However, the entire City of Smithville is at some risk for wildfires.

Figure 6-7. Wildland Urban Interface Map – Smithville ISD



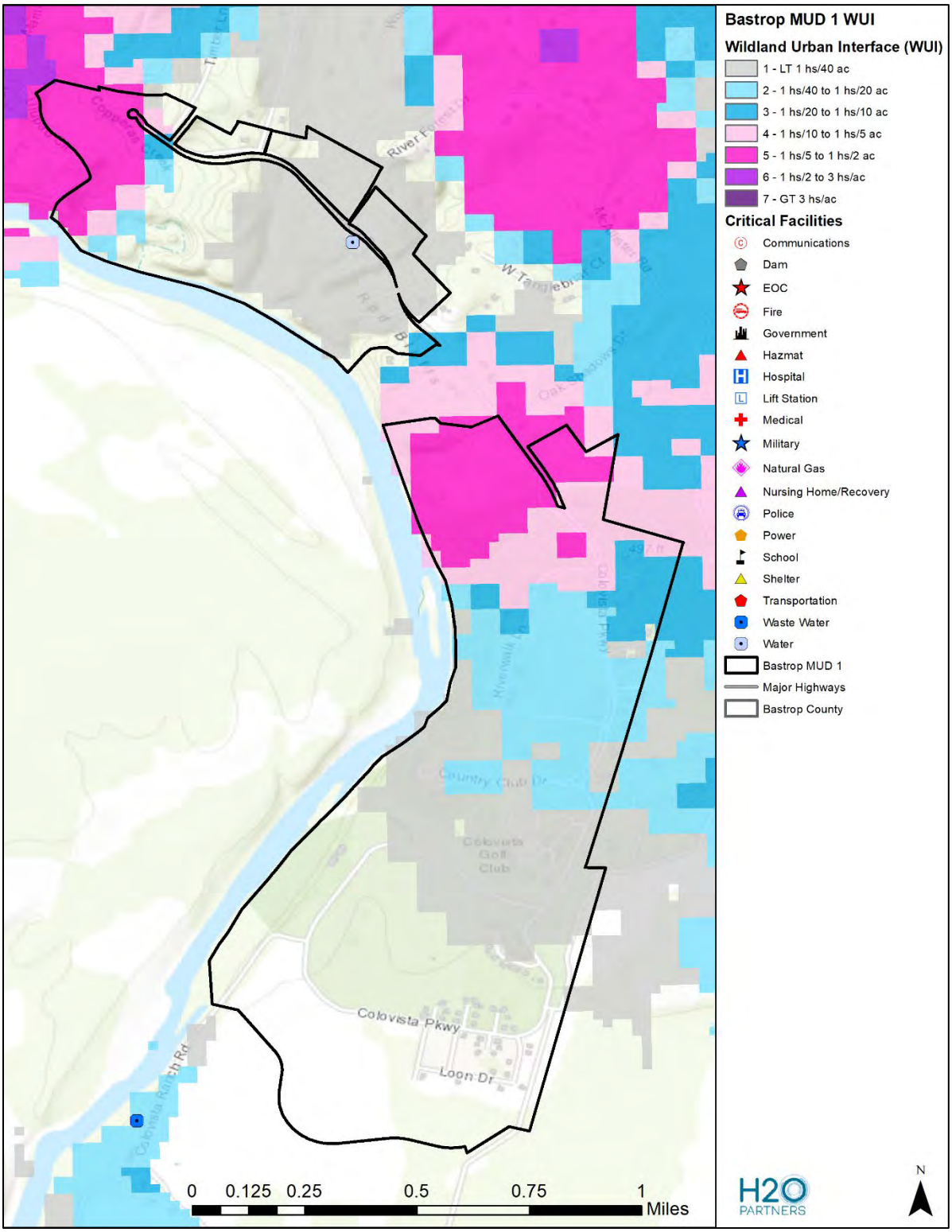
Three of the Smithville ISD facilities are located within the WUI. However, all Smithville ISD facilities are at some risk for wildfires.

Figure 6-8. Wildland Urban Interface Map – McDade ISD



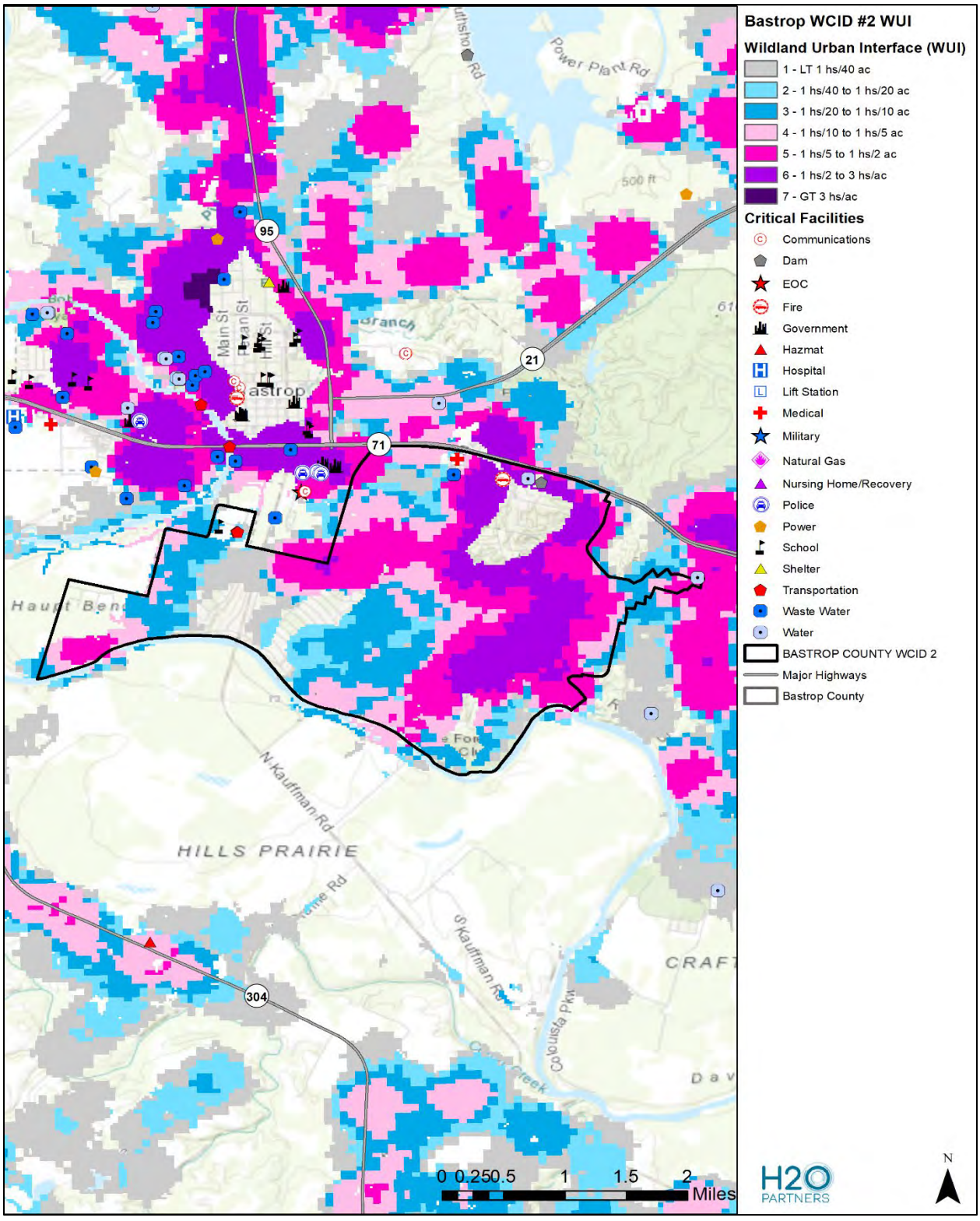
Fifteen of the McDade ISD facilities are located within the WUI. However, all McDade ISD facilities are at some risk for wildfires.

Figure 6-9. Wildland Urban Interface Map – Bastrop County MUD #1



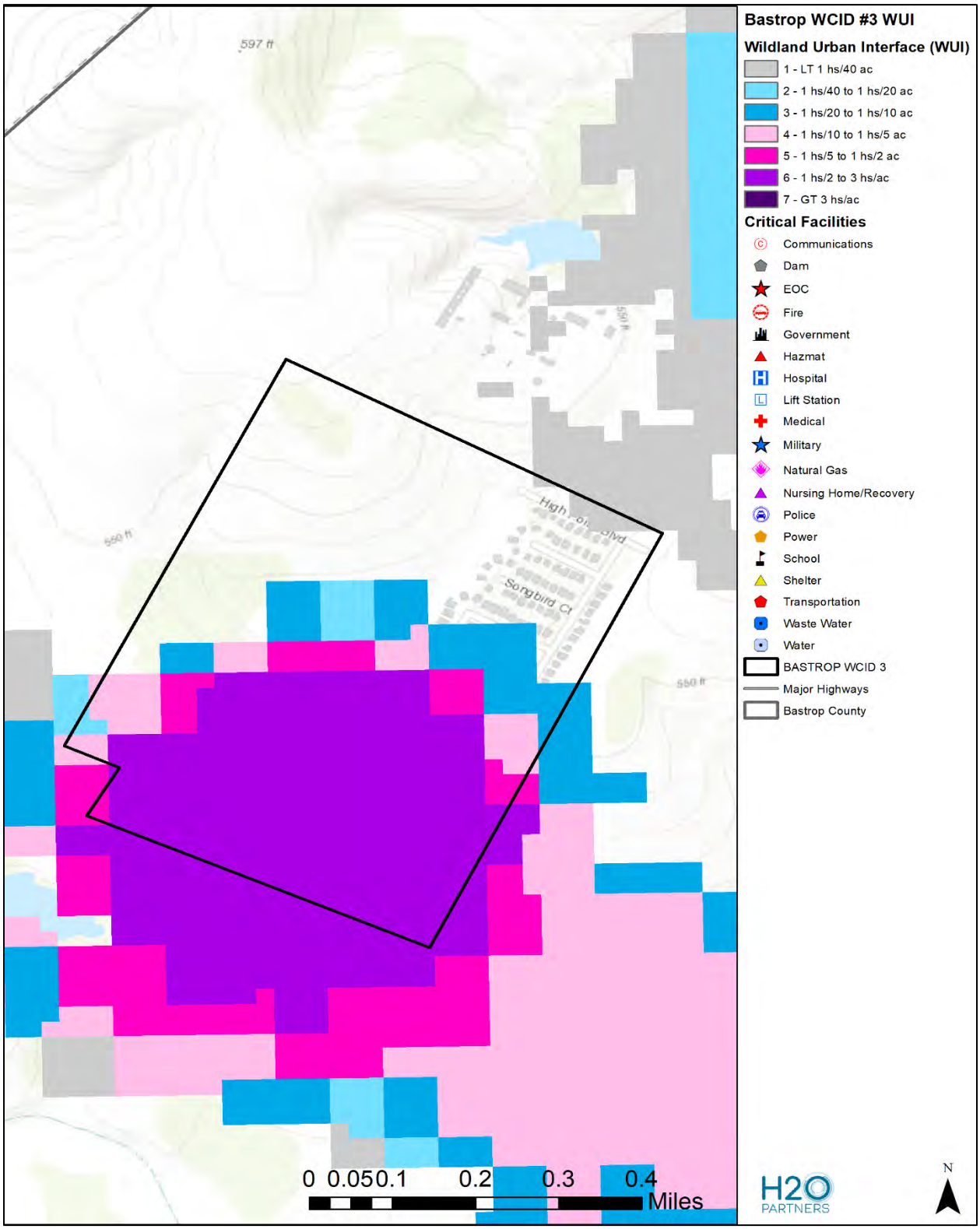
The Bastrop County MUD #1 has one facility located in the WUI, however all facilities in the Bastrop County MUD #1 are at some risk for wildfires.

Figure 6-10. Wildland Urban Interface Map – Bastrop County WCID #2



The Bastrop County WCID #2 has one facility located in the WUI, however all WCID #2 facilities are at some risk for wildfires.

Figure 6-11. Wildland Urban Interface Map – Bastrop County WCID #3



The Bastrop County WCID #3 has several facilities located in the WUI, however all Bastrop County WCID #3 facilities are at some risk for wildfires.

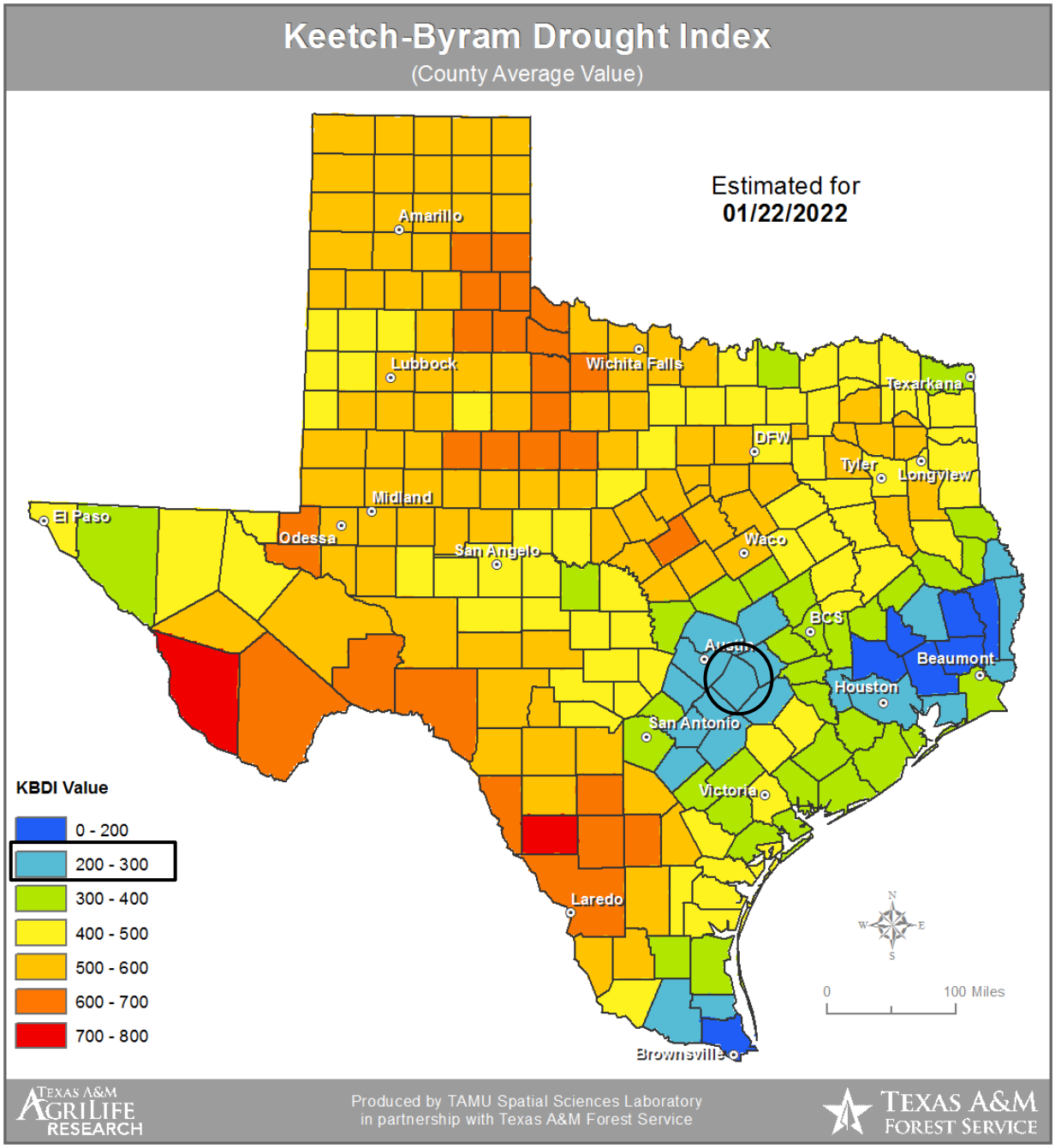
SECTION 6: WILDFIRE

EXTENT



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

Figure 6-12. Keetch-Byram Drought Index (KBDI) for the State of Texas, 2022[1]



[1] Bastrop County is located within the black circle.

Figure 6-13. Fire Intensity Scale Map – Bastrop County

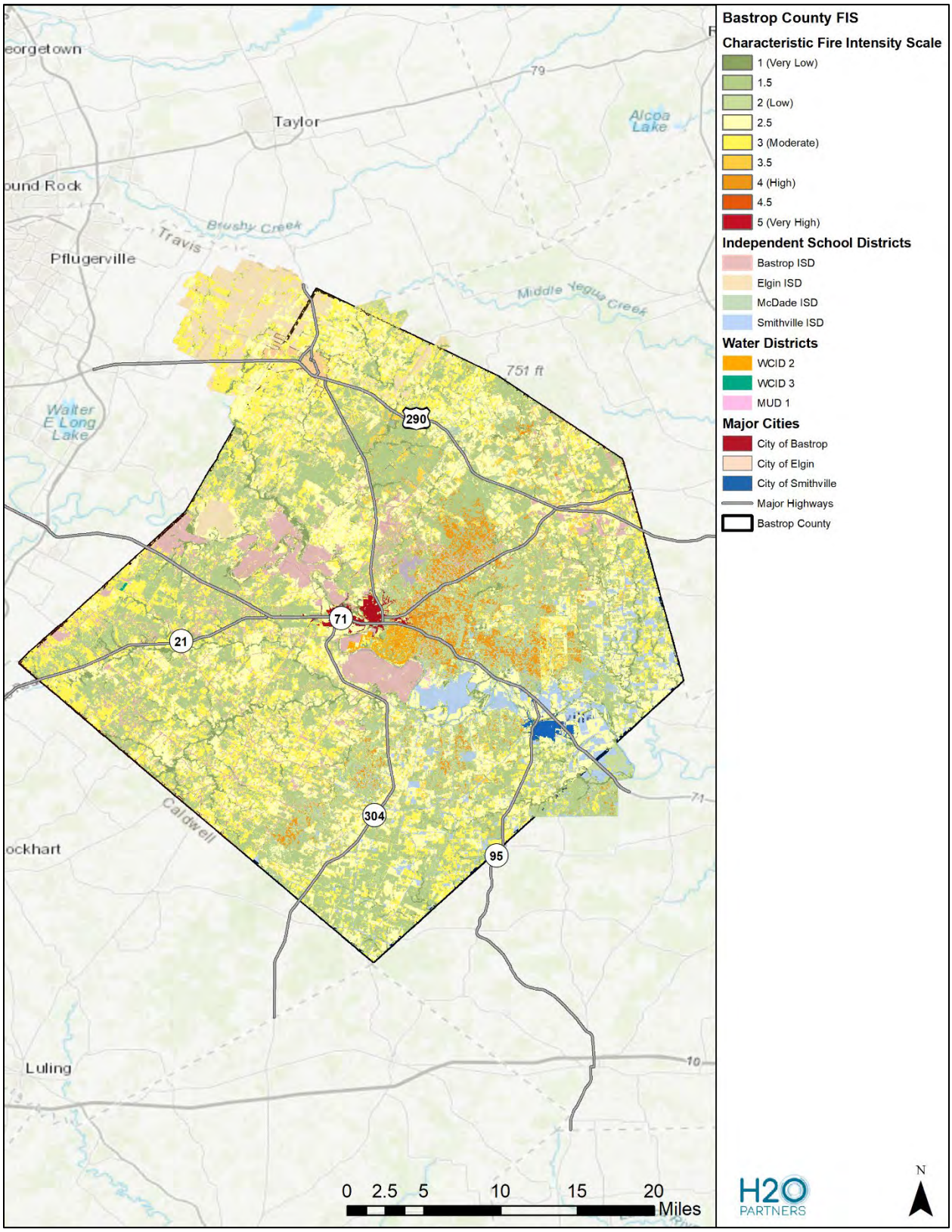


Figure 6-14. Fire Intensity Scale Map – City of Bastrop

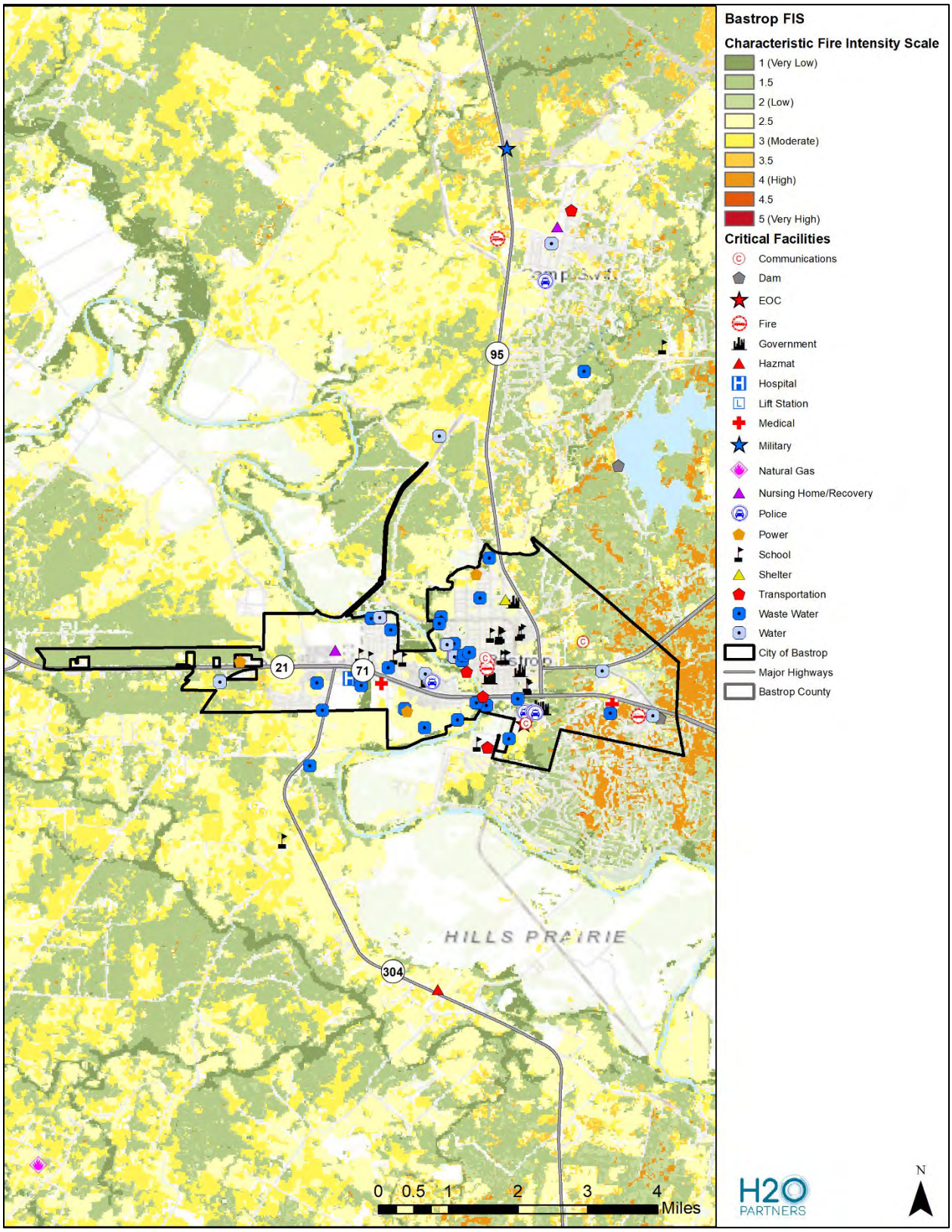


Figure 6-15. Fire Intensity Scale Map – Bastrop ISD

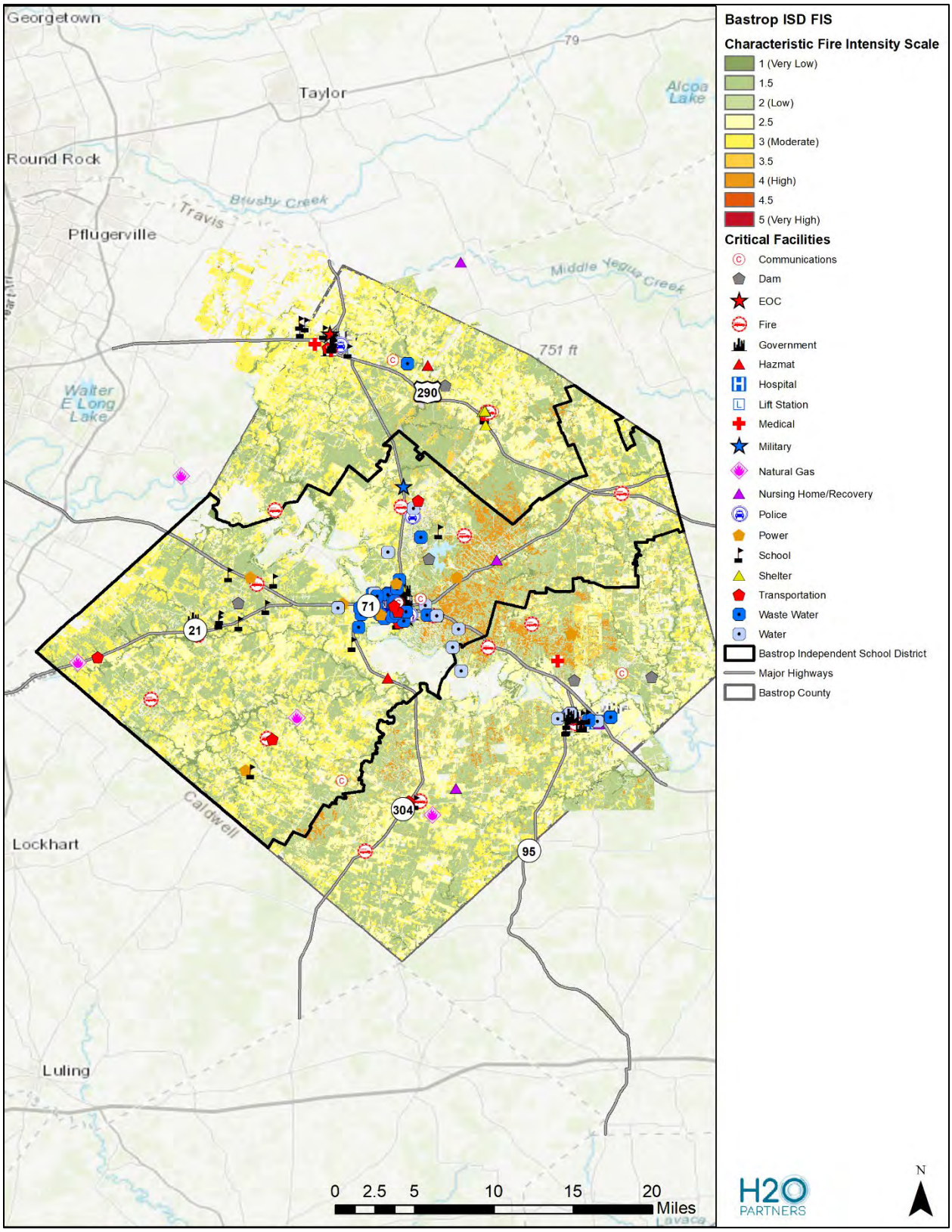


Figure 6-16. Fire Intensity Scale Map – City of Elgin

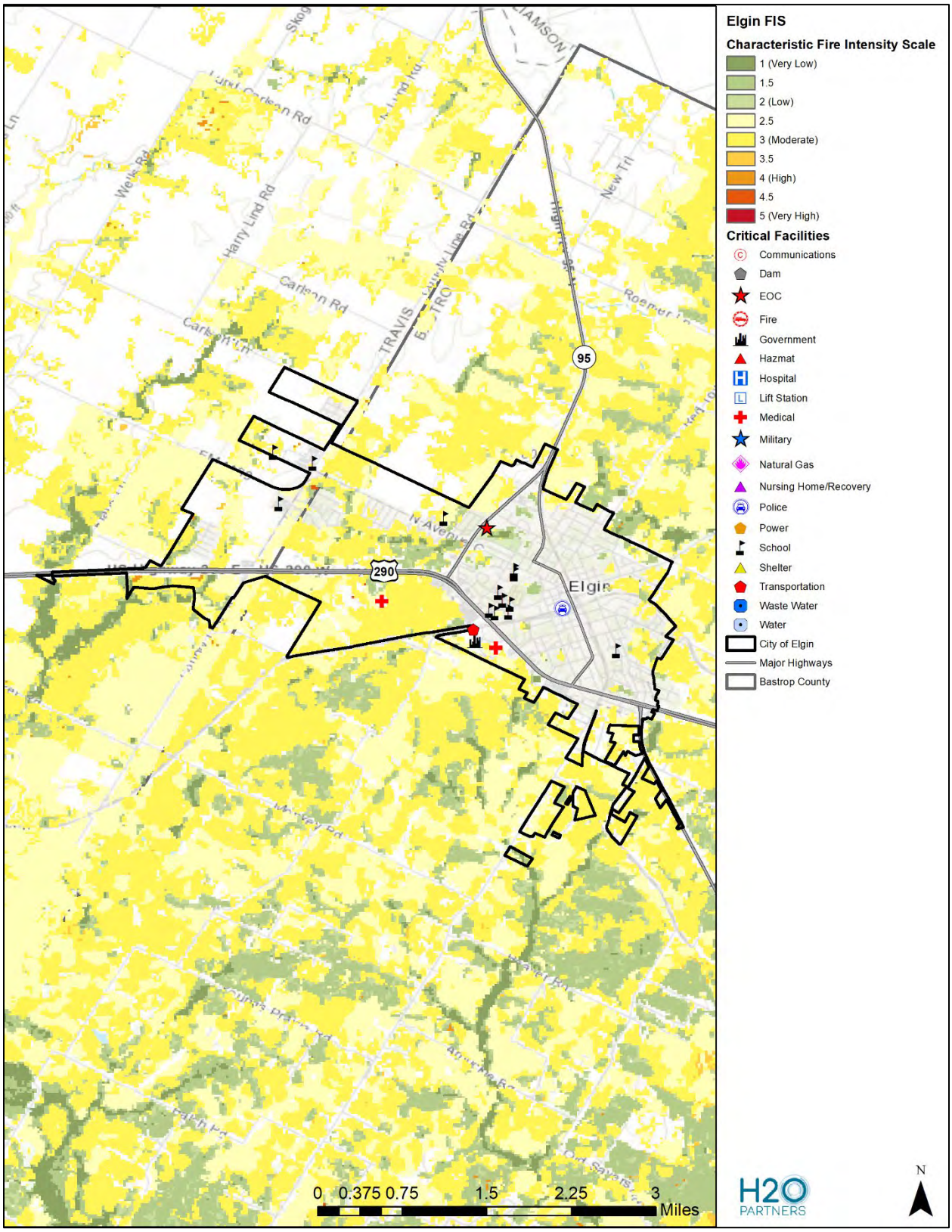


Figure 6-17. Fire Intensity Scale Map – Elgin ISD

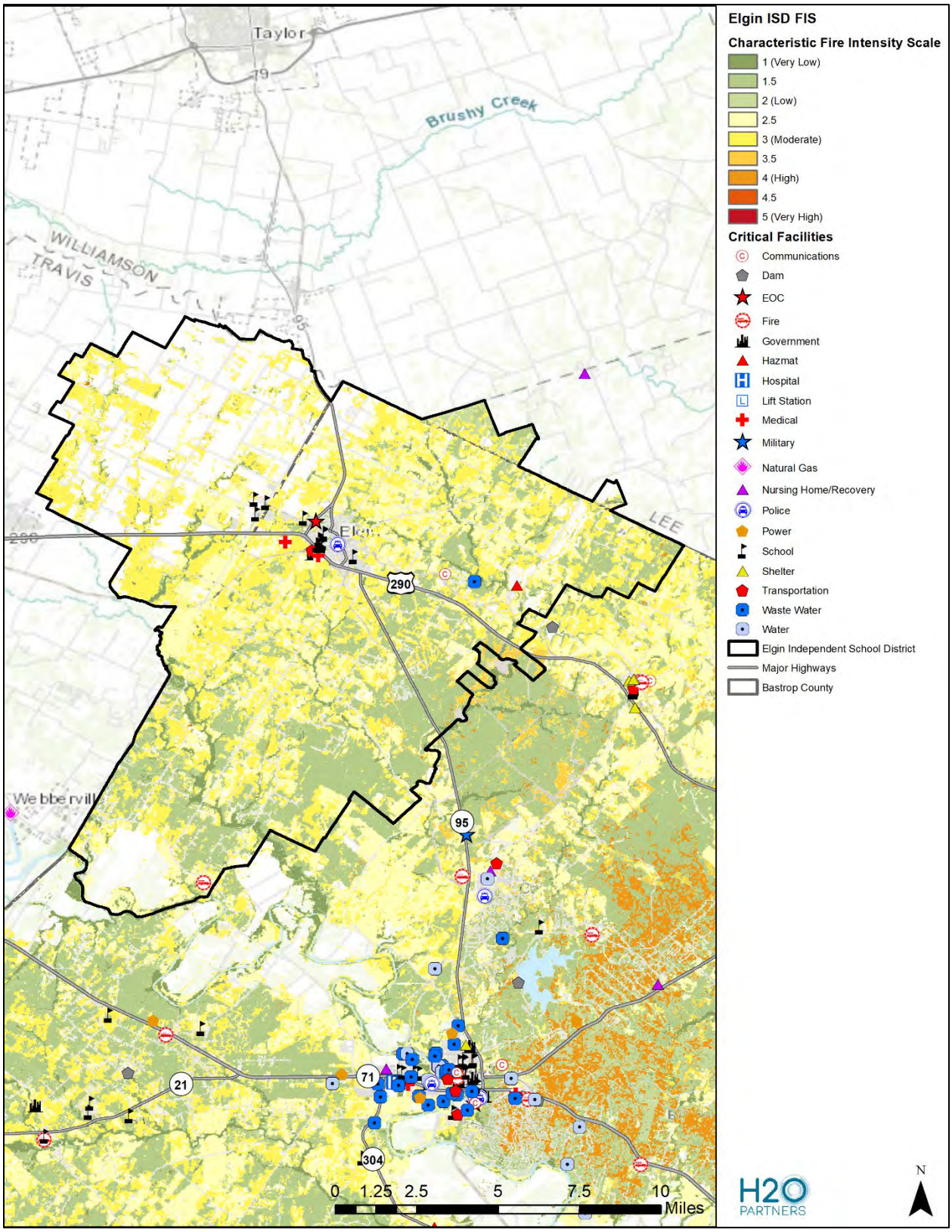


Figure 6-18. Fire Intensity Scale – City of Smithville

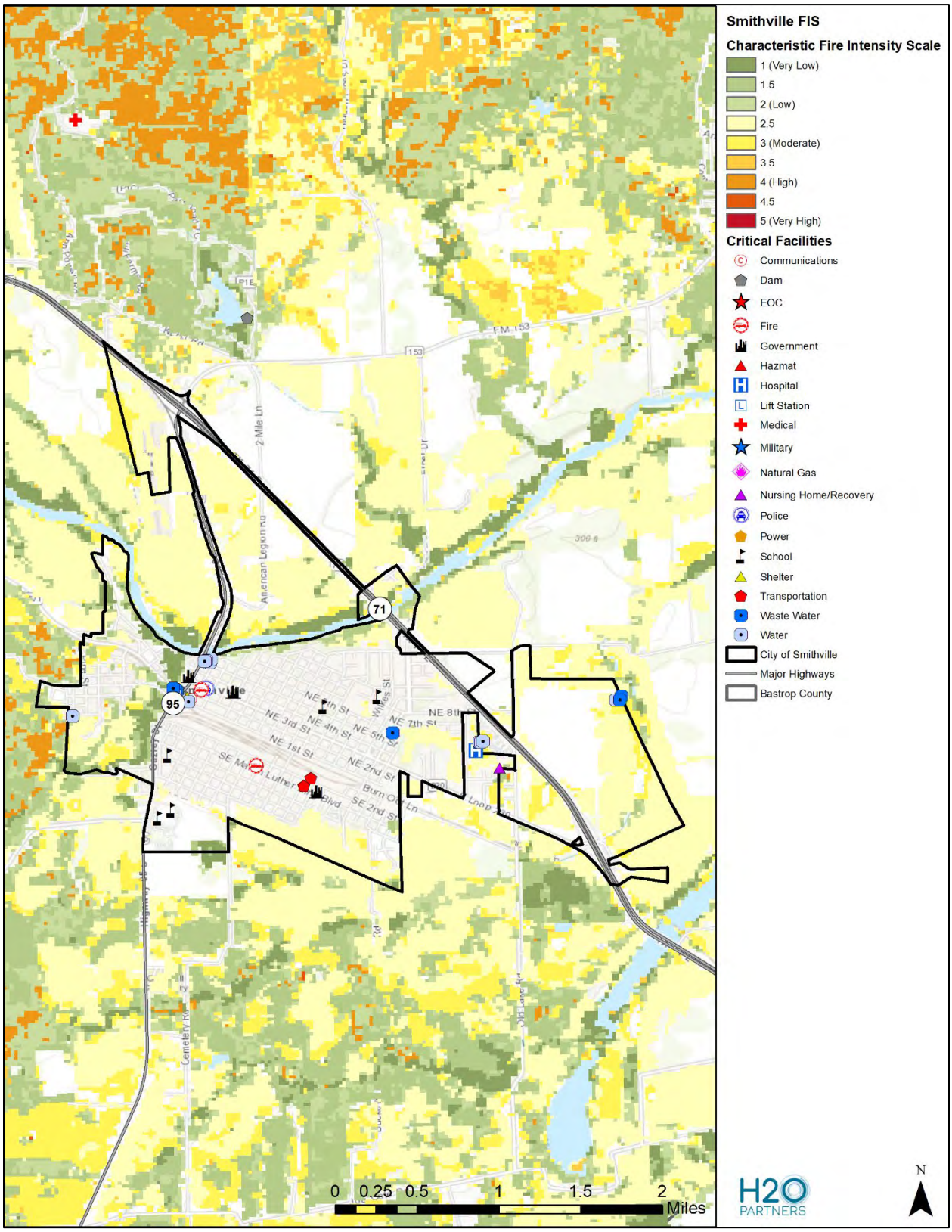


Figure 6-19. Fire Intensity Scale –Smithville ISD

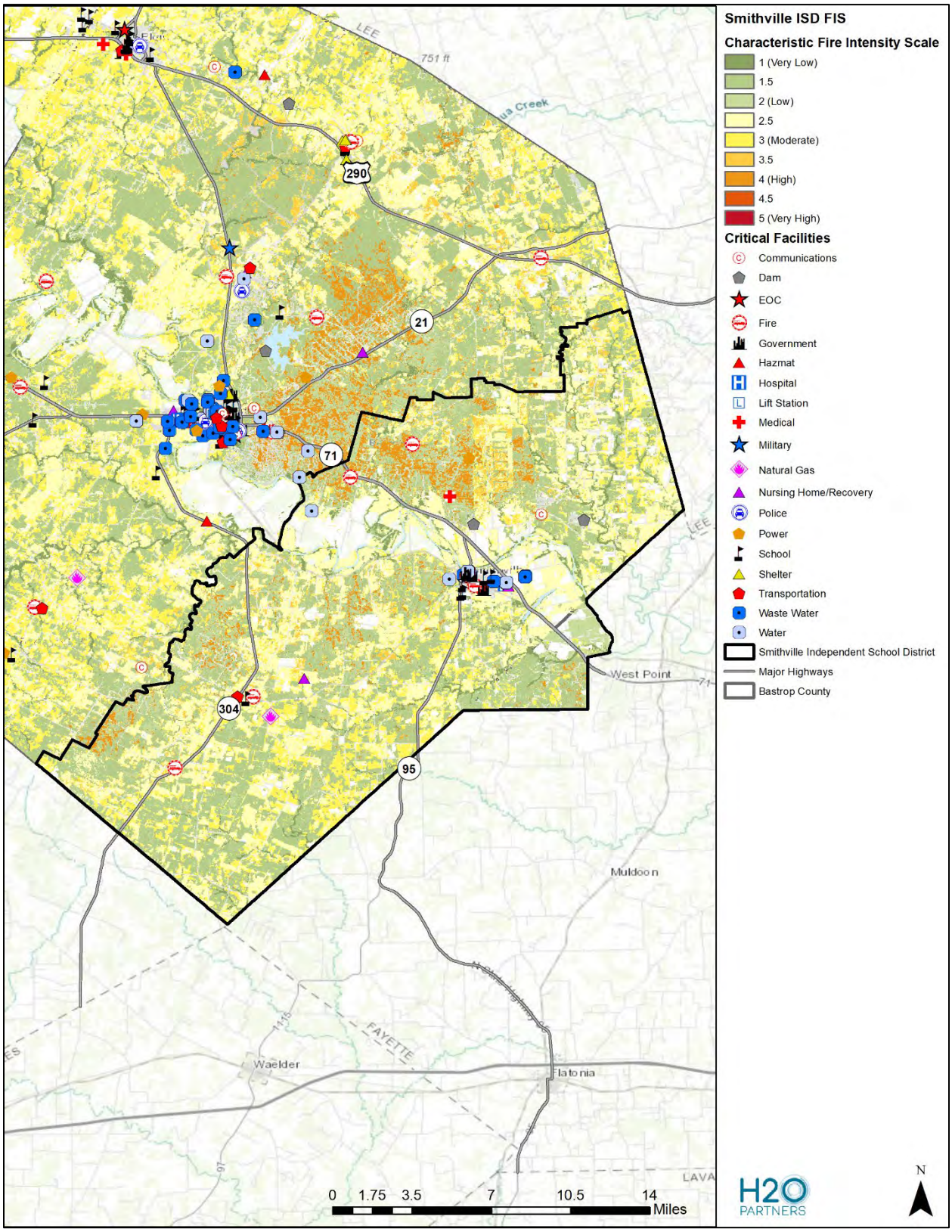


Figure 6-20. Fire Intensity Scale – McDade ISD

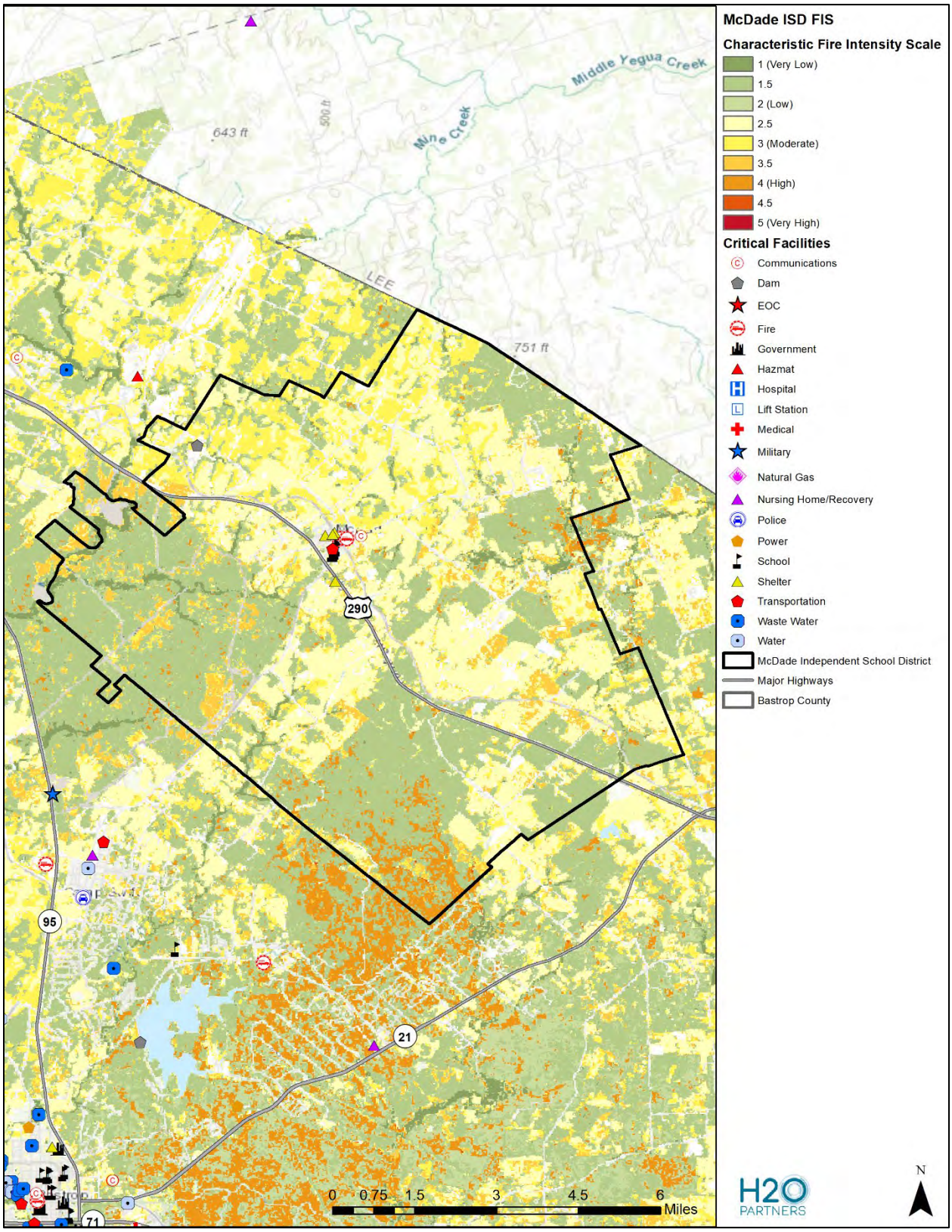


Figure 6-21. Fire Intensity Scale Map – Bastrop County MUD #1

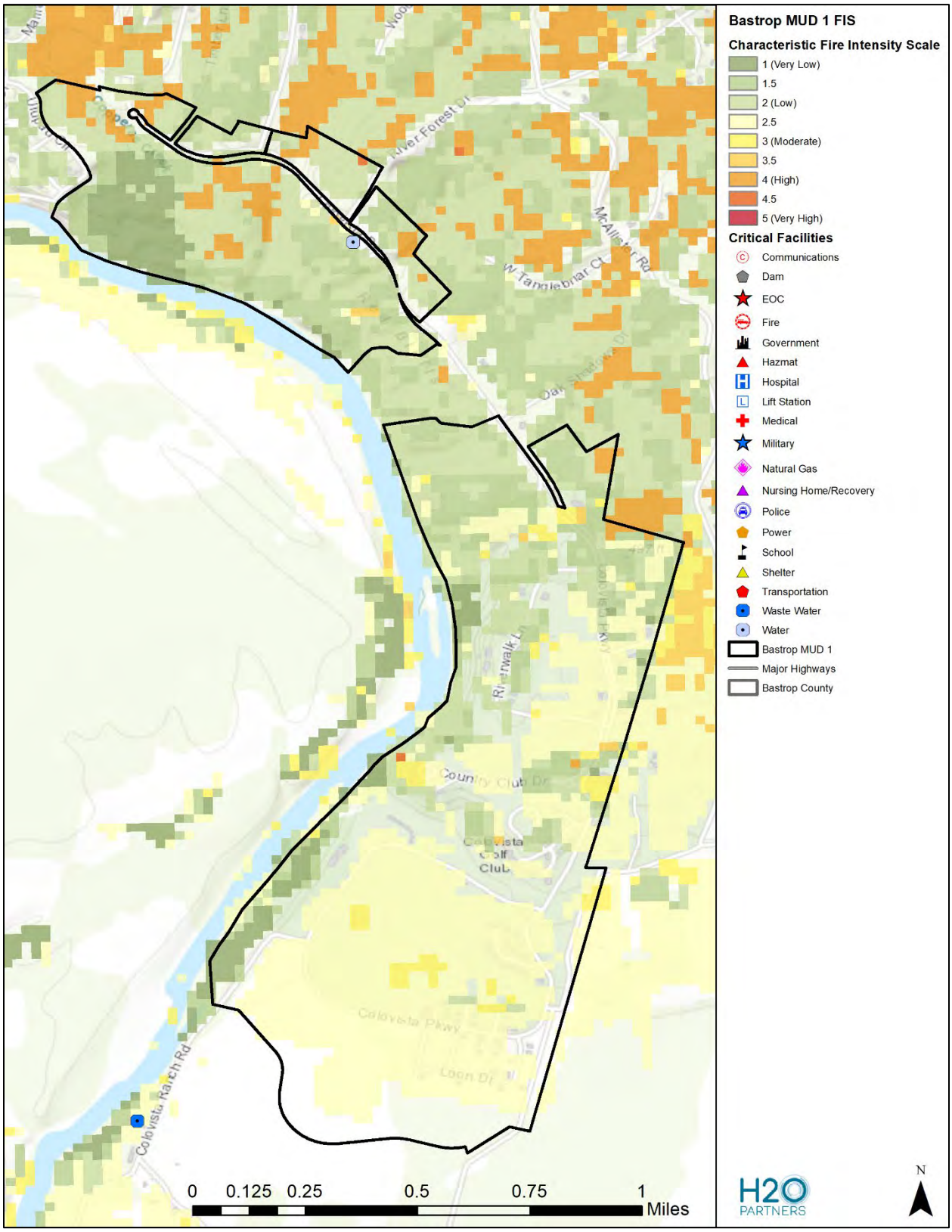


Figure 6-22. Fire Intensity Scale Map – Bastrop County WCID #2

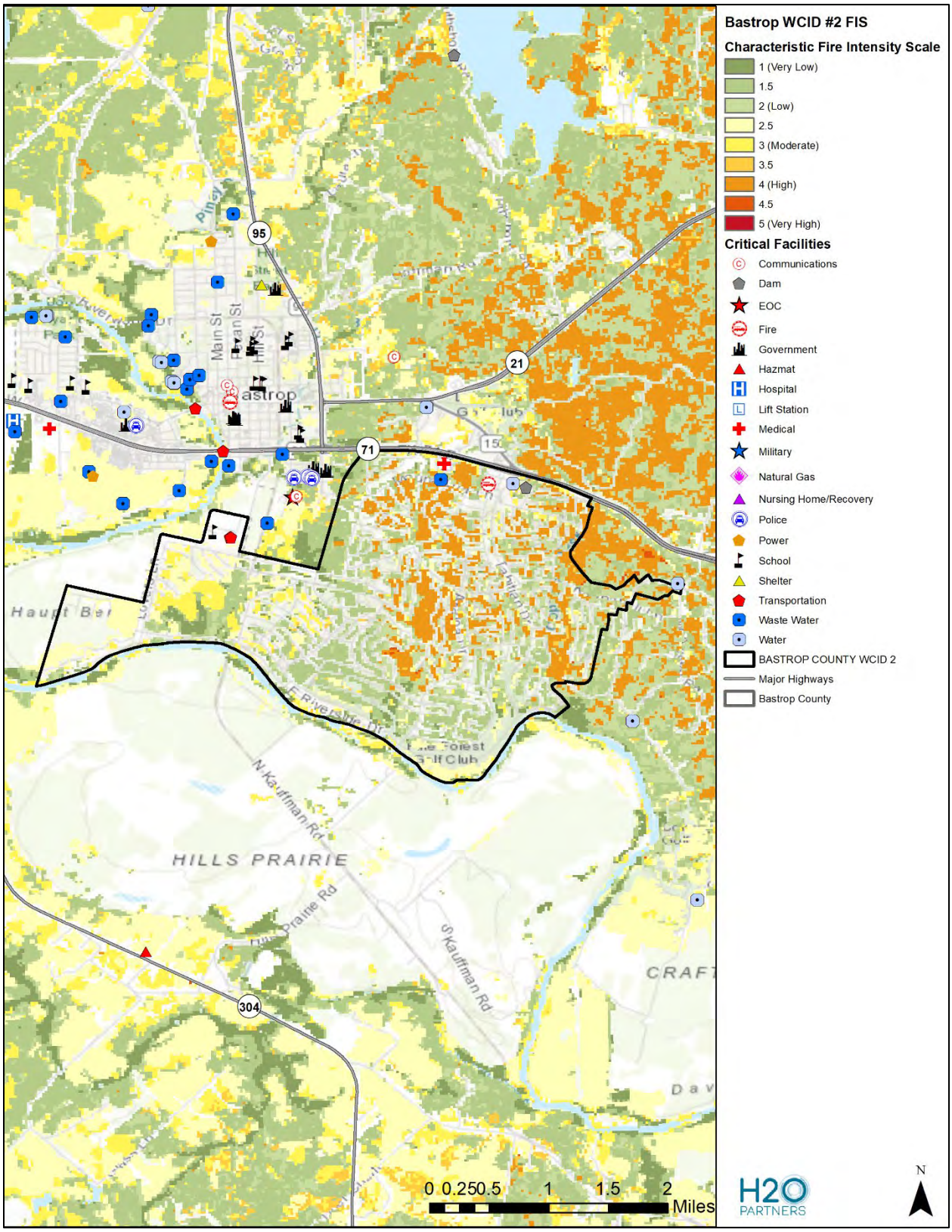
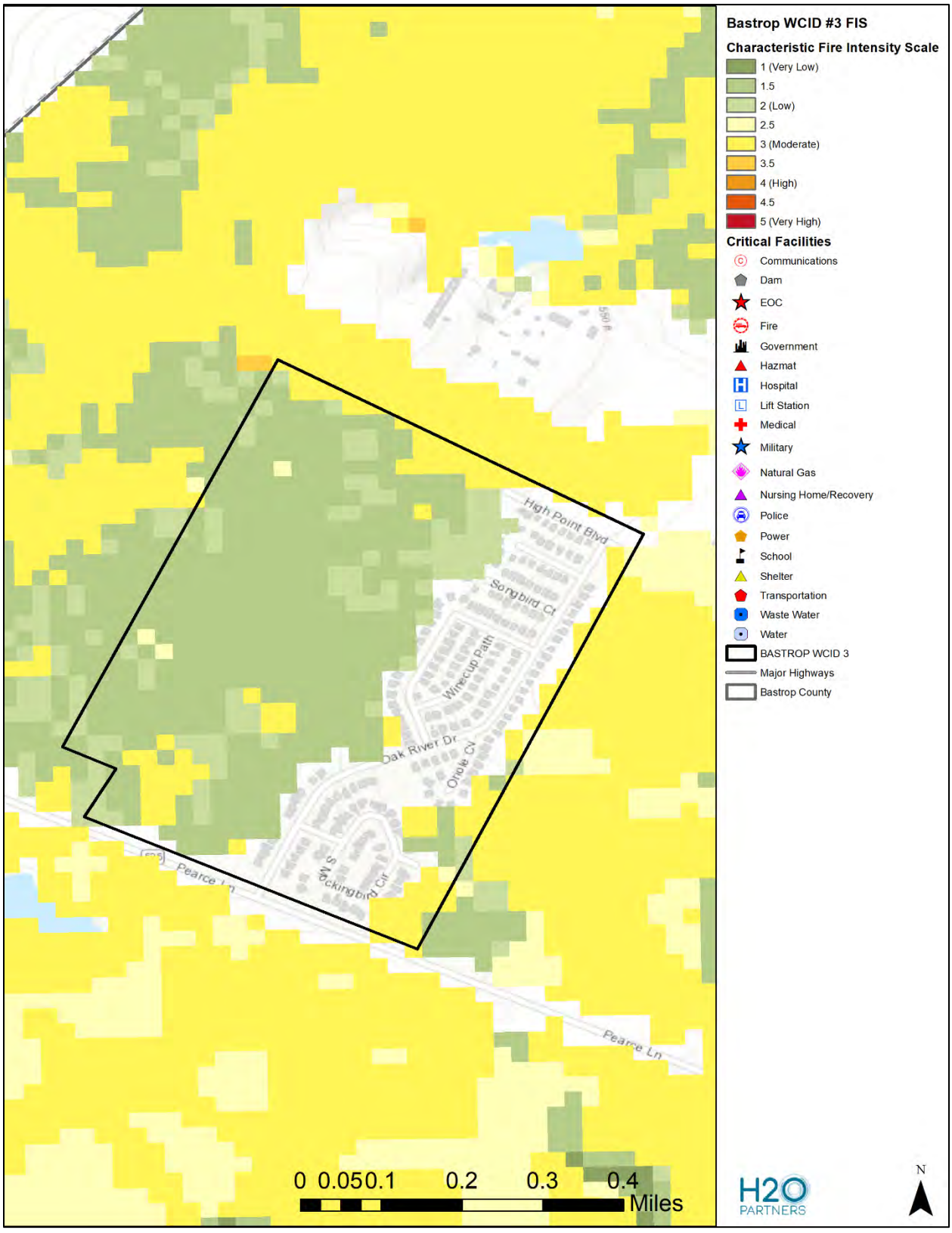


Figure 6-23. Fire Intensity Scale Map– Bastrop County WCID #3



HISTORICAL OCCURRENCES

The Texas Forest Service reported 2,049 wildfire events between 2005 and 2020. The National Center for Environmental Information (NCEI) only reported two events from 1996 through 2021. Due to a lack of recorded data for wildfire events prior to 2005 and after 2020[2], frequency calculations are based on a sixteen-year period using only data from recorded years. The map below shows approximate locations of wildfires, which can be grass or brushfires of any size (Figure 6-24). Table 6-1 identifies the number of wildfires by jurisdiction and total acreage burned.

Historical wildfire data for the Bastrop ISD are provided within the Bastrop city-wide reporting, respectively, per the NCEI database. Similarly, wildfire data for the Elgin and Smithville ISD are provided within the Elgin and Smithville city-wide reporting, respectively, per the NCEI database as they do not have events reported separate and apart from the reported community events.

Historical wildfire data for the McDade ISD, MUD #1, WCID #2 and WCID #3 are provided within the Bastrop County events per the NCEI database as they do not have events reported separate and apart from the reported county events.

There have been no reported losses as a result of wildfire for Bastrop ISD, Elgin ISD, McDade ISD, Smithfield ISD or WCID #3. Minor wildfire damages were reported for MUD #1 and WCID #2 due to the 2011 wildfires.

[2] The Texas Forest Service data is currently only available through 2020.

Figure 6-24. Location and Historic Wildfire Events for Bastrop County Planning Area

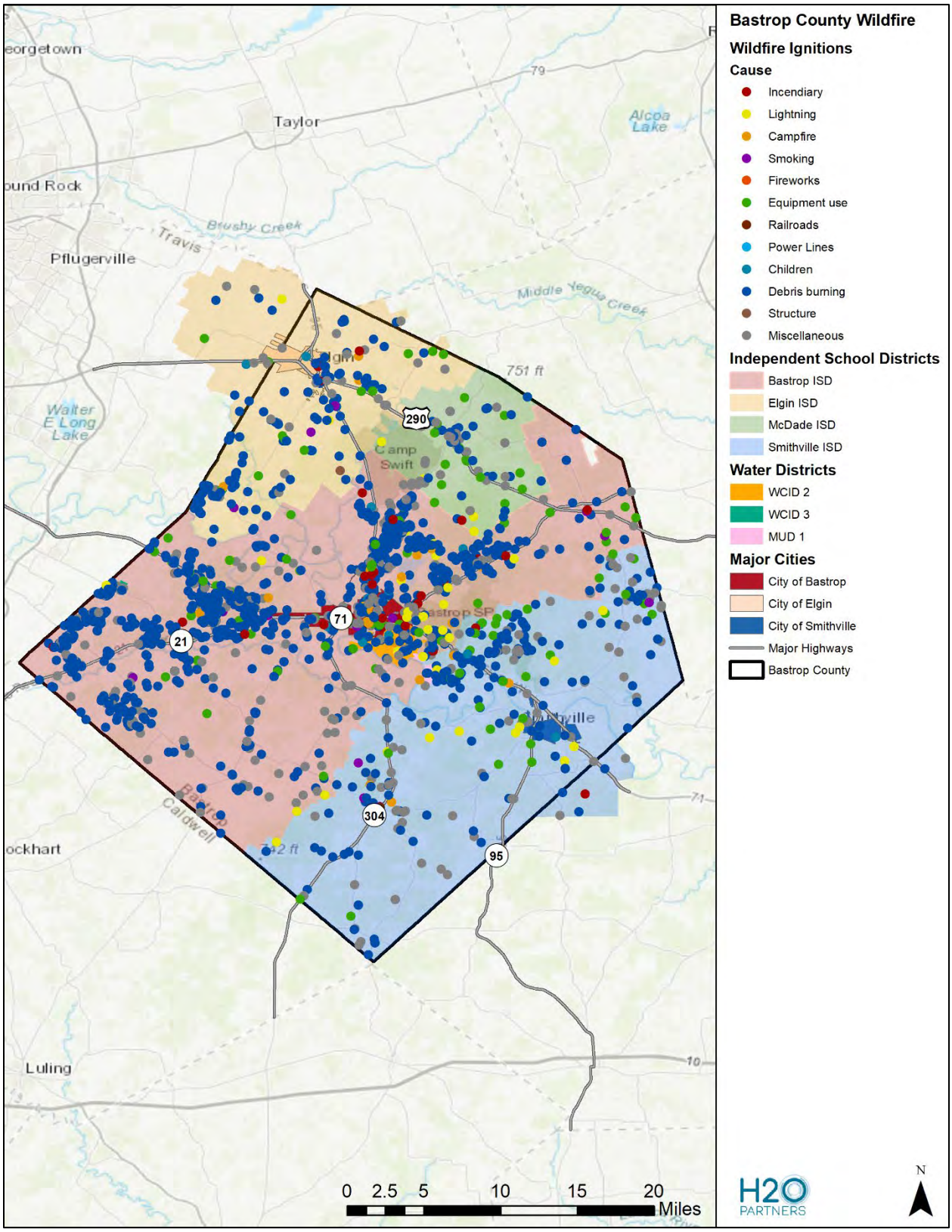


Table 6-1. Historical Wildfire Events Summary

JURISDICTION	NUMBER OF EVENTS	ACRES BURNED
Bastrop County	1,929	14,614
City of Bastrop	91	190
City of Elgin	18	20
City of Smithville	11	3

Table 6-2. Acreage of Suppressed Wildfire by Year

YEAR	BASTROP COUNTY	CITY OF BASTROP	CITY OF ELGIN	CITY OF SMITHVILLE
2005	318	16	1	0
2006	554	91	0	0
2007	495	3	0	0
2008	953	10	7	0
2009	1,923	10	0	2
2010	789	0	1	0
2011	3,557	51	11	0
2012	177	0	0	0
2013	445	0	0	1
2014	81	1	0	0
2015	4,746	6	0	0
2016	91	1	0	0
2017	133	1	0	0
2018	182	0	0	0
2019	170	0	0	0
2020	0	0	0	0

Based on the list of historical wildfire events for the Bastrop County planning area (listed above) 85 of the events have occurred since the 2016 Plan.

PROBABILITY OF FUTURE EVENTS

Wildfires can occur at any time of the year. As the jurisdictions within the county move into wildland, the potential area of occurrence of wildfire increases. With 2,049 events in a 16-year

period, an event within Bastrop County, including all participating jurisdictions, ISDs, and special districts, is highly likely, meaning an event is probable within the next year.

VULNERABILITY AND IMPACT

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

The heavily populated, urban areas of Bastrop County are not likely to experience large, sweeping fires. Areas in the unincorporated portions of Bastrop County are vulnerable, including rural areas such as Highway 71 between Bastrop and Smithville, Highway 290 between Elgin and McDade as well as between McDade and Paige, and Route 304 south of Bastrop to the county border. Unoccupied buildings and open spaces that have not been maintained have the greatest vulnerability to wildfire. The overall level of concern for wildfires is located mostly along the perimeter of the study area where wildland and urban areas interface. Figures 6-1 through 6-11 illustrate the areas that are the most vulnerable to wildfire throughout the planning area.

The following critical facilities are located in the WUI and are more susceptible to wildfire in each participating jurisdiction:

Table 6-3. Critical Facilities Located in WUI by Jurisdiction

JURISDICTION	CRITICAL FACILITIES
Bastrop County	4 Communications Facilities, 1 County 911 Dispatch Facility, 4 Government Facilities, 1 Detention Facility, 3 Educational Facilities, 1 EOC, 1 Prison Facility, 12 Fire Station Facilities, 1 Hazardous Material Facilities, 1 Vulnerable Population Residential Facilities, 4 Emergency Medical Facilities, 1 Military Training Facility, 1 Pipeline Transportation Facility, 1 Power Generation Facility, 1 Propane Distribution Facility, 1 Rail Yard Facility, 4 Government Storage Facilities, 1 School Bus Transport Facility, 2 DOT Program Facilities, 2 Water Facilities
City of Bastrop	1 Bridge, 1 Government Facility, 1 Corrections Facility, 2 Educational Facilities, 1 Electric Substations, 1 Emergency Shelter, 2 Fire Station Facilities, 1 Emergency Medical Facility, 2 Police Station Facilities (including 911 Center), 14 Wastewater Lift Stations, 2 Wastewater Treatment Facilities, 2 Water Treatment Facilities, 10 Water Well Facilities
City of Elgin	1 Emergency Evacuation Center, 1 Helicopter Landing Pad, 1 Water Treatment Facility
City of Smithville	1 Government Facility, 1 Communications Facility, 1 Emergency Shelter, 1 Fire Station, 3 Wastewater Treatment Facilities, Water Storage Facilities
Bastrop ISD	9 School Campus Locations (All facilities including schools, administration facilities, maintenance and operations facilities, service center, stadium, technology building, and transportation facility)

JURISDICTION	CRITICAL FACILITIES
Elgin ISD	4 School Campus Locations (All facilities including schools, administration facilities, development center, maintenance and operations, nutrition services facility, technology building, and transportation facility)
McDade ISD	1 School Campus Location (All facilities including schools, administration facilities, AG shop facility, band hall, maintenance and operations, nutrition services facility, technology building, and transportation facility)
Smithville ISD	2 School Campus Locations (All facilities including schools, administration facilities, and maintenance and operations facilities)
Bastrop County MUD #1	1 Water Facility, Pipeline Infrastructure
Bastrop County WCID#2	1 Water Well and Pumping Station, Pipeline Infrastructure
Bastrop County WCID#3	None

Within Bastrop County, a total of 2,049 fire events were reported from 2005 to 2020. All of these events were suspected wildfires. Historic loss and annualized estimates due to wildfires are presented in Table 6-4 below. The frequency is approximately 128 events every year.

Annualized losses are not included for participating ISDs or any of the participating special districts as there have not been events or losses to affect these entities separate and apart from historical occurrences for the cities in which they are located (see historical occurrences above).

Table 6-4. Potential Annualized Losses by Jurisdiction[3]

JURISDICTION	ACRES BURNED	ANNUAL ACRE LOSSES
Bastrop County	14,614	913.4
City of Bastrop	190	11.9
City of Elgin	20	1.3
City of Smithville	3	0.2
Planning Area	**14,827**	**926.7**

Figures 6-25 through 6-35 show the threat of wildfire to the planning area including Bastrop County, all participating ISDs and all participating special districts.

[3] Events divided by 16 years of data.

Figure 6-25. Wildfire Ignition Density – Bastrop County

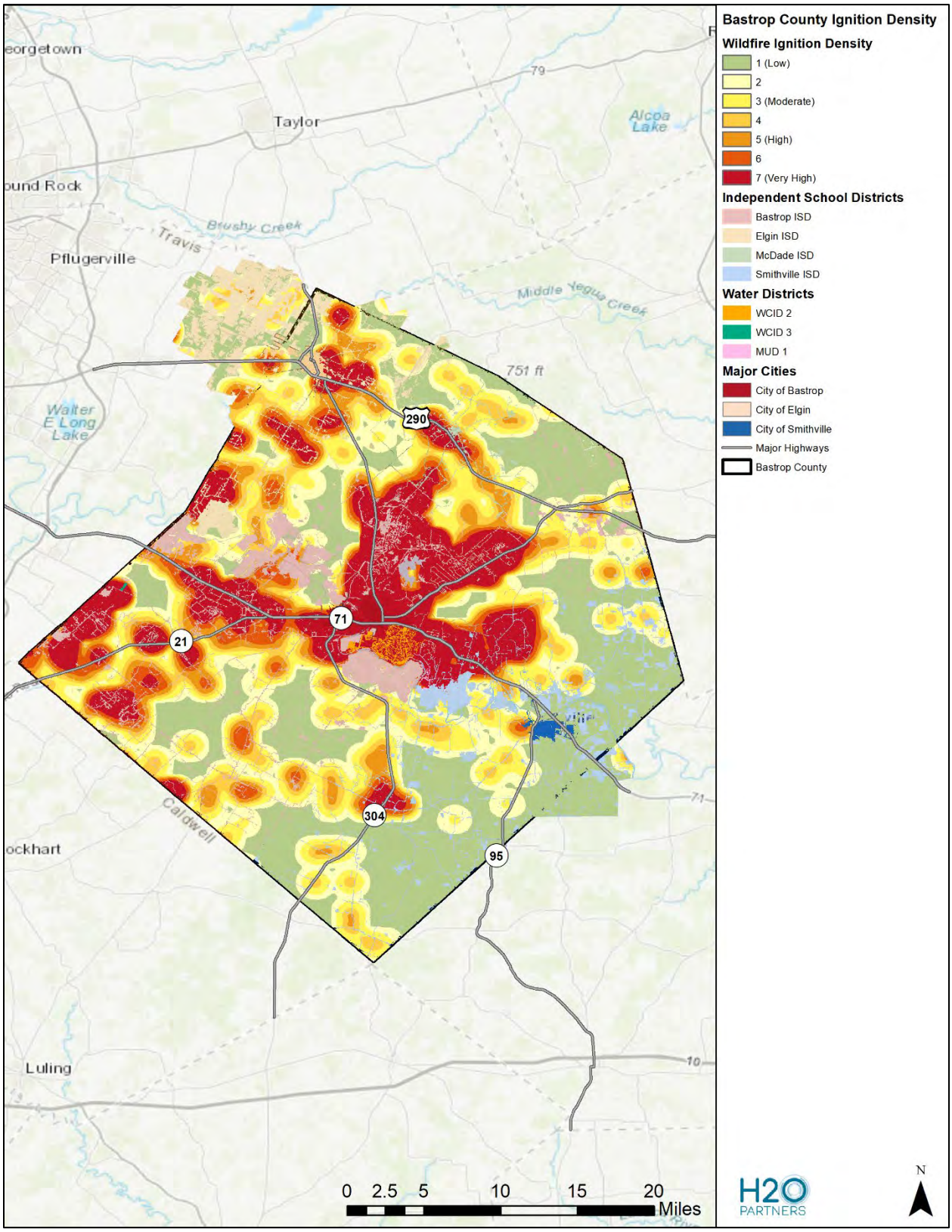


Figure 6-26. Wildfire Ignition Density – City of Bastrop

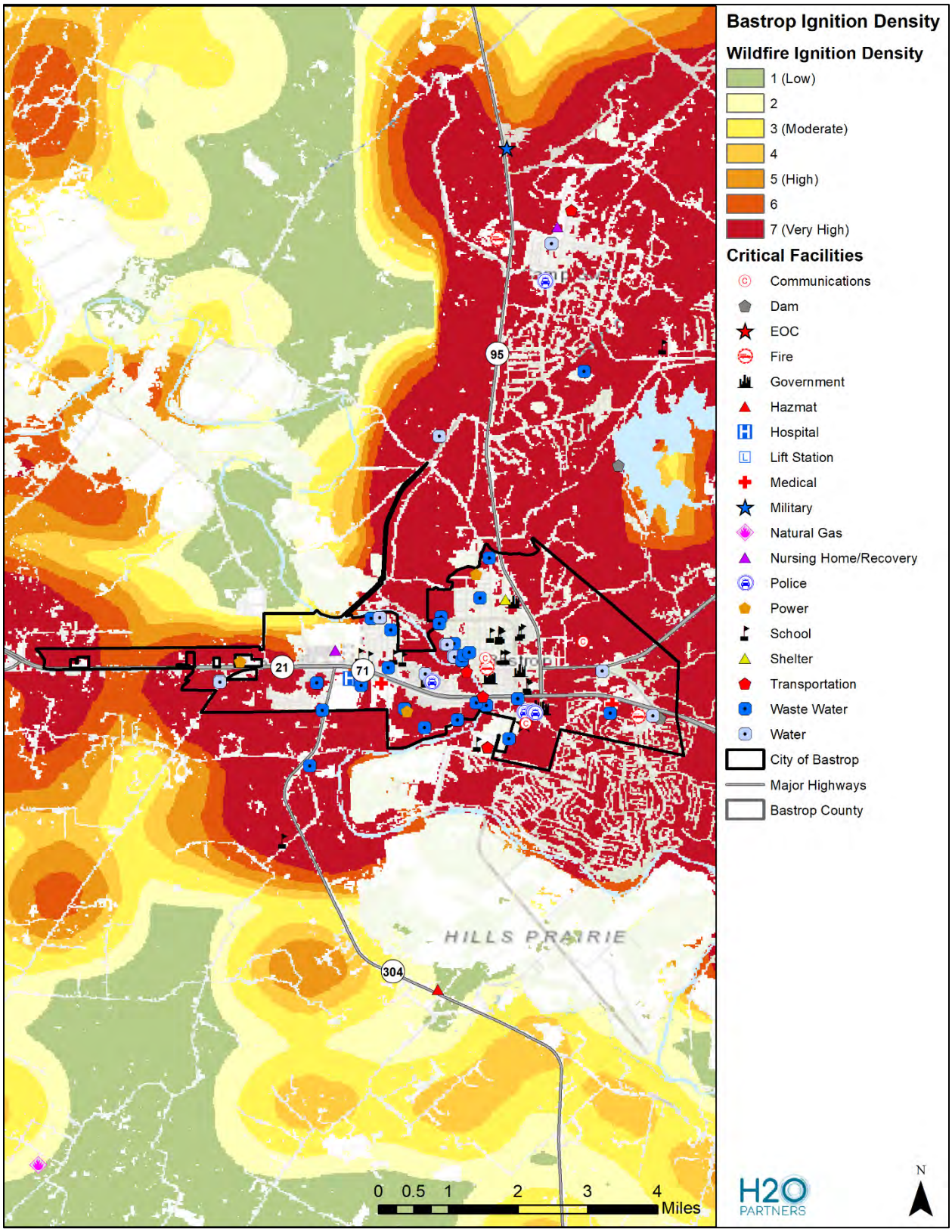


Figure 6-27. Wildfire Ignition Density – Bastrop ISD

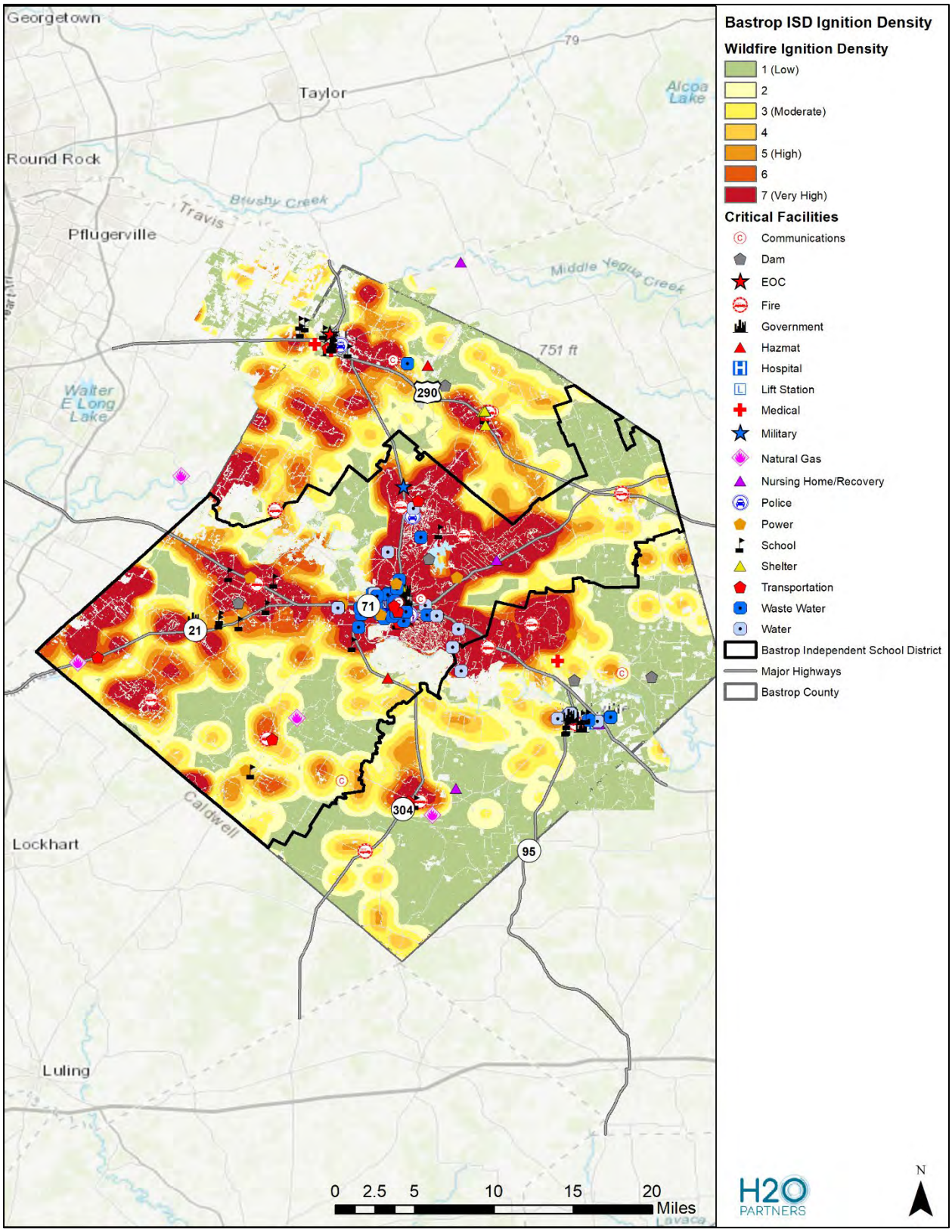


Figure 6-28. Wildfire Ignition Density – City of Elgin

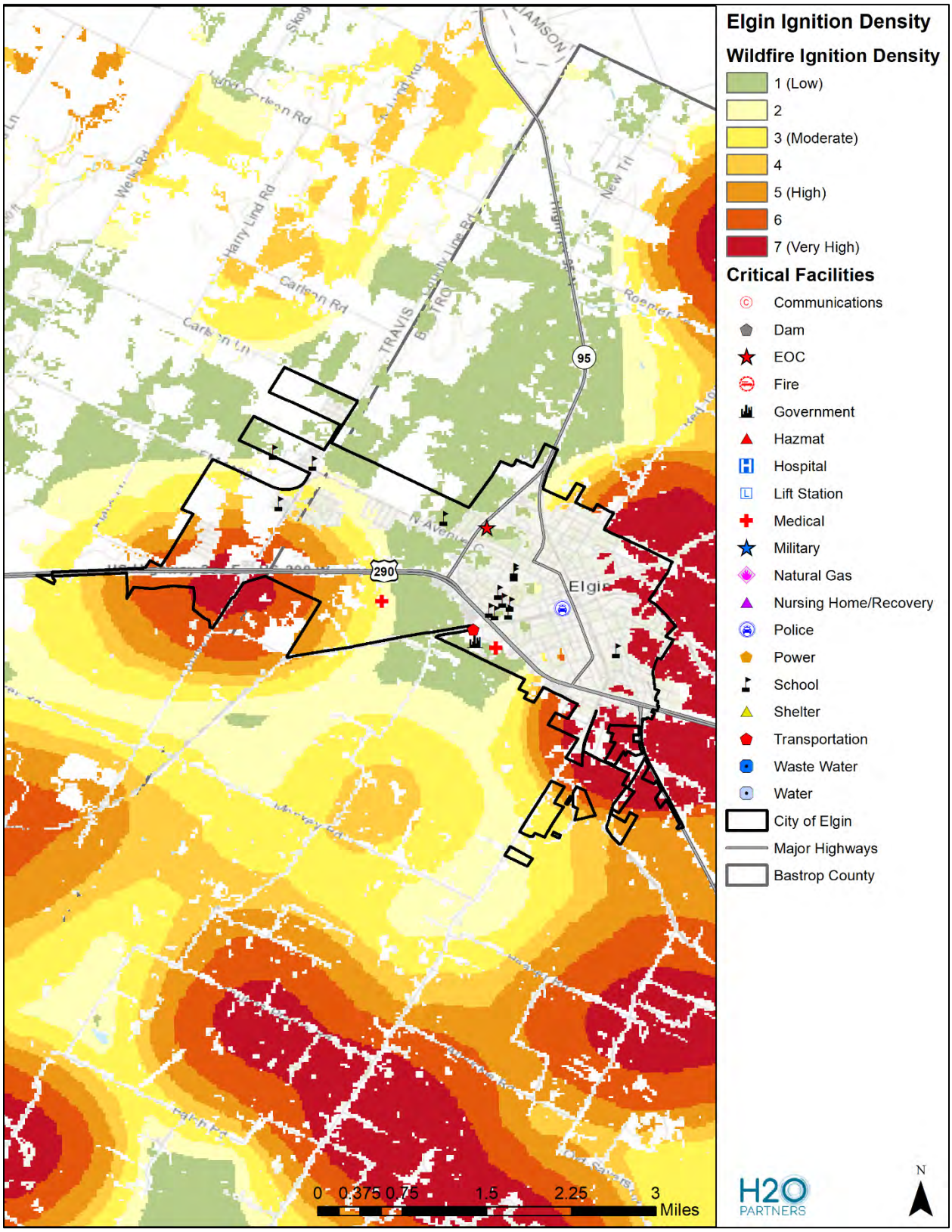


Figure 6-29. Wildfire Ignition Density – Elgin ISD

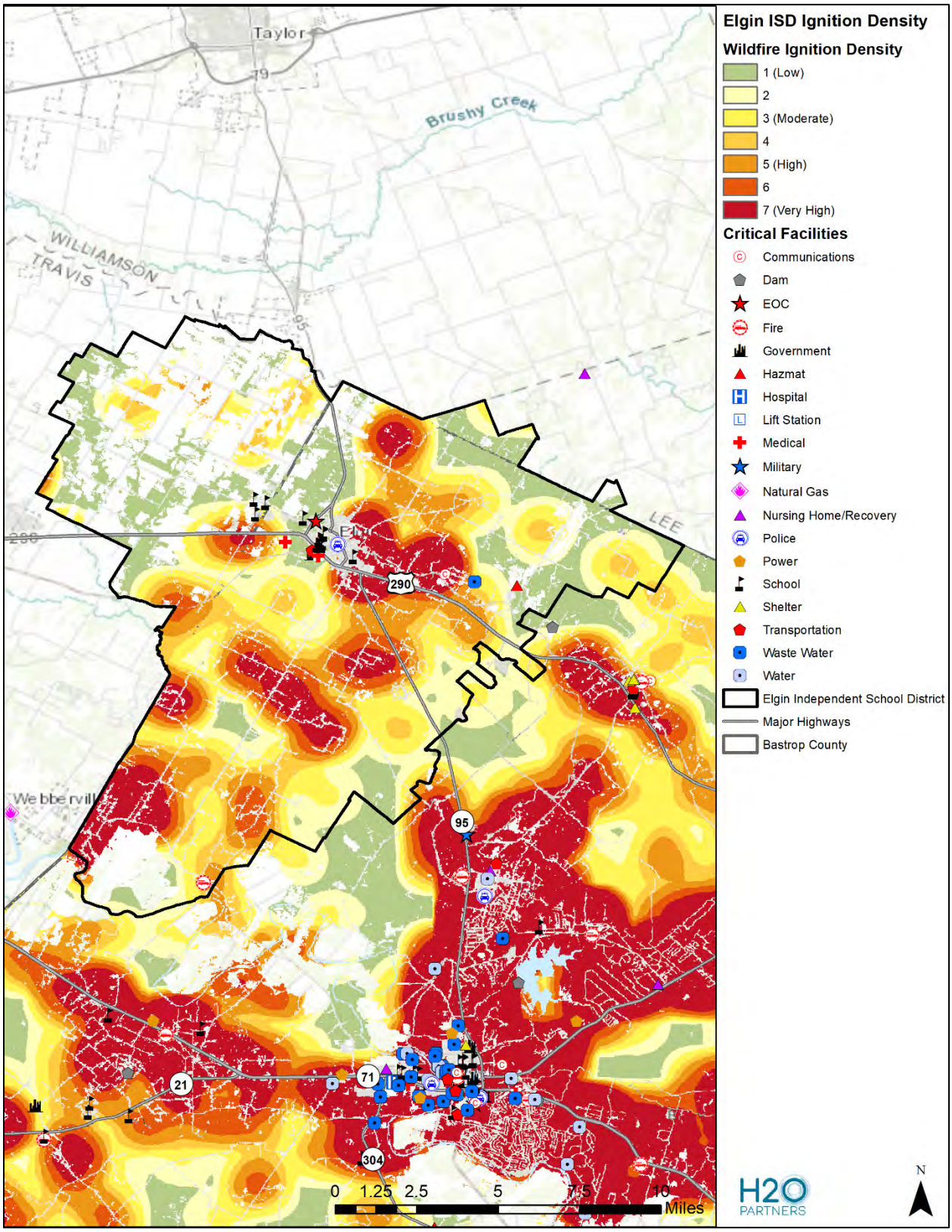


Figure 6-30. Wildfire Ignition Density – City of Smithville

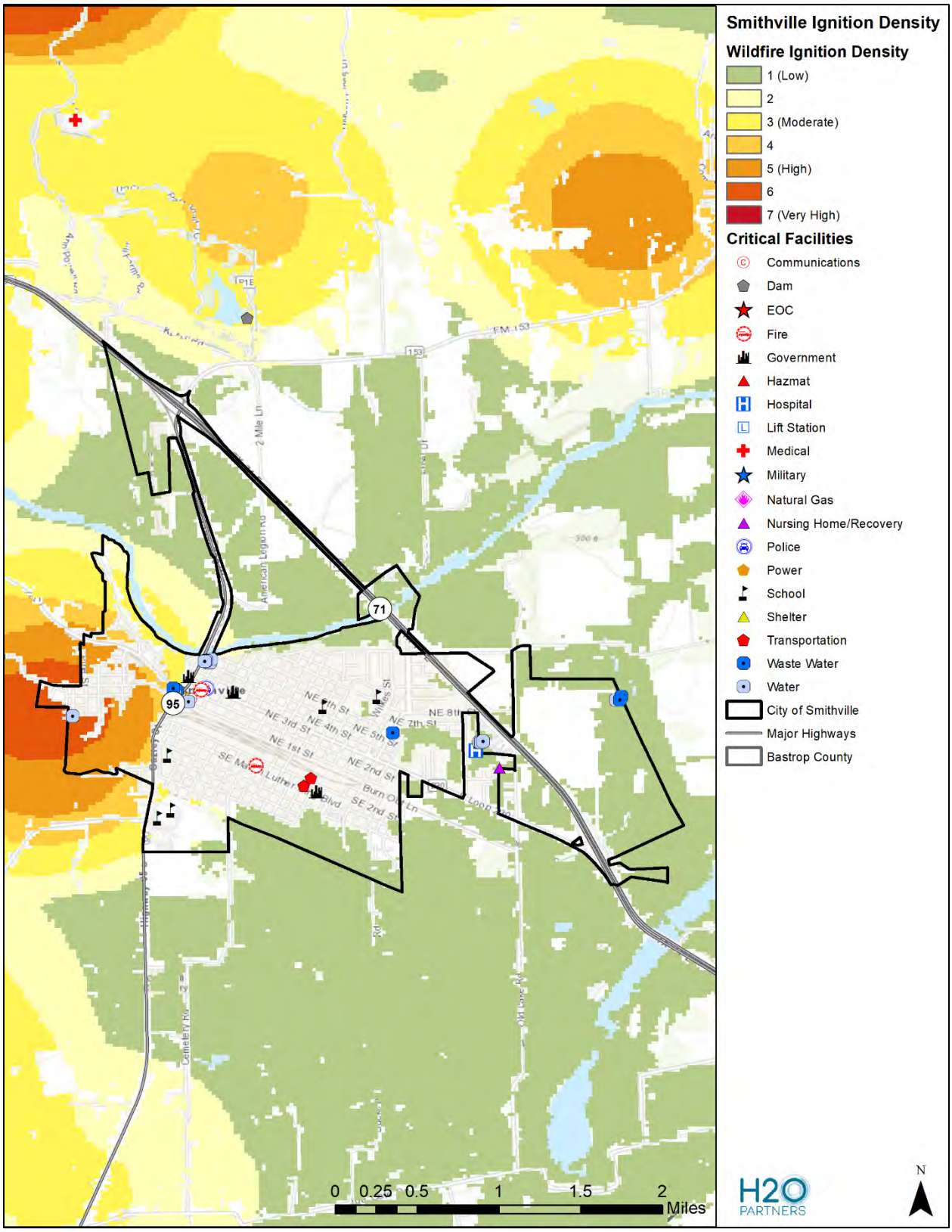


Figure 6-31. Wildfire Ignition Density – Smithville ISD

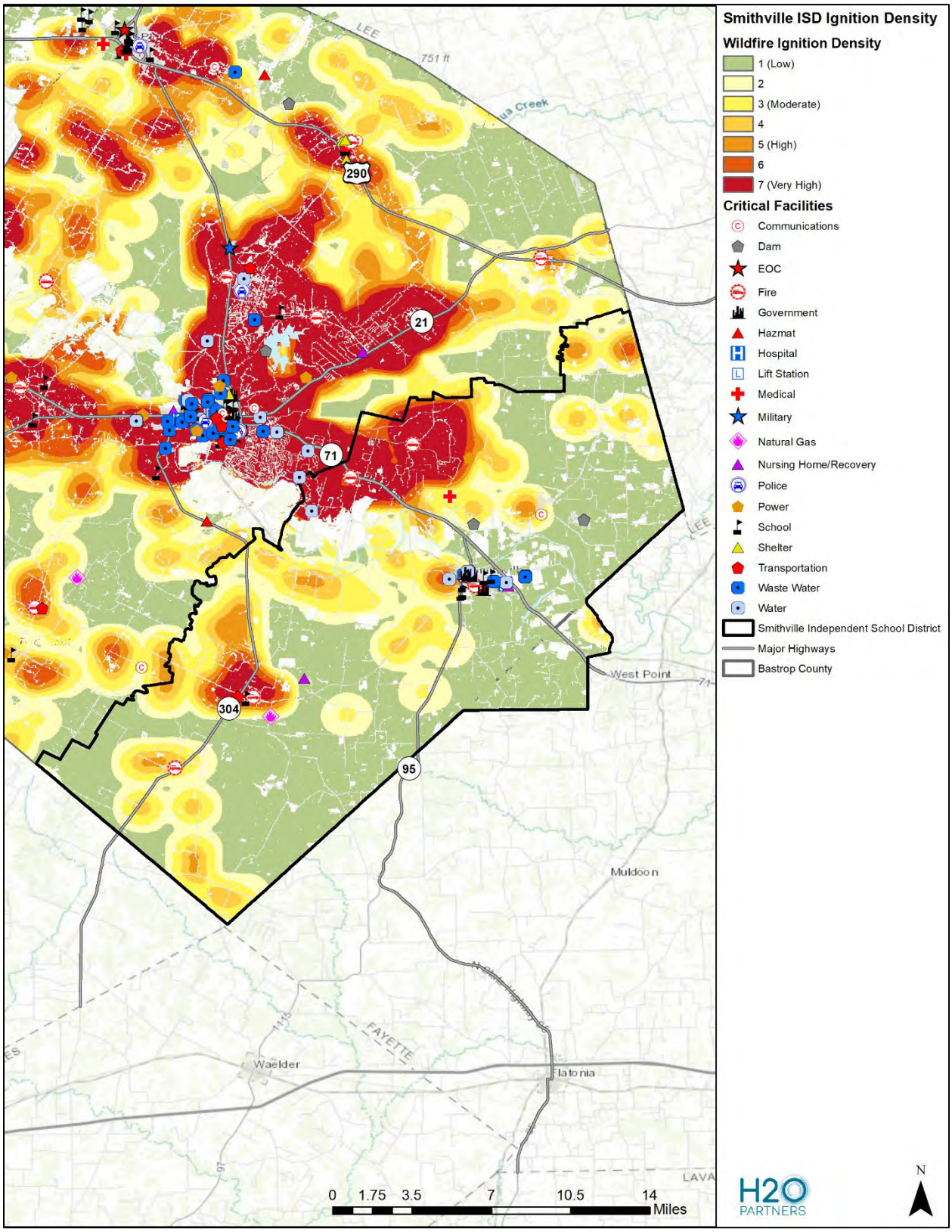


Figure 6-32. Wildfire Ignition Density – McDade ISD

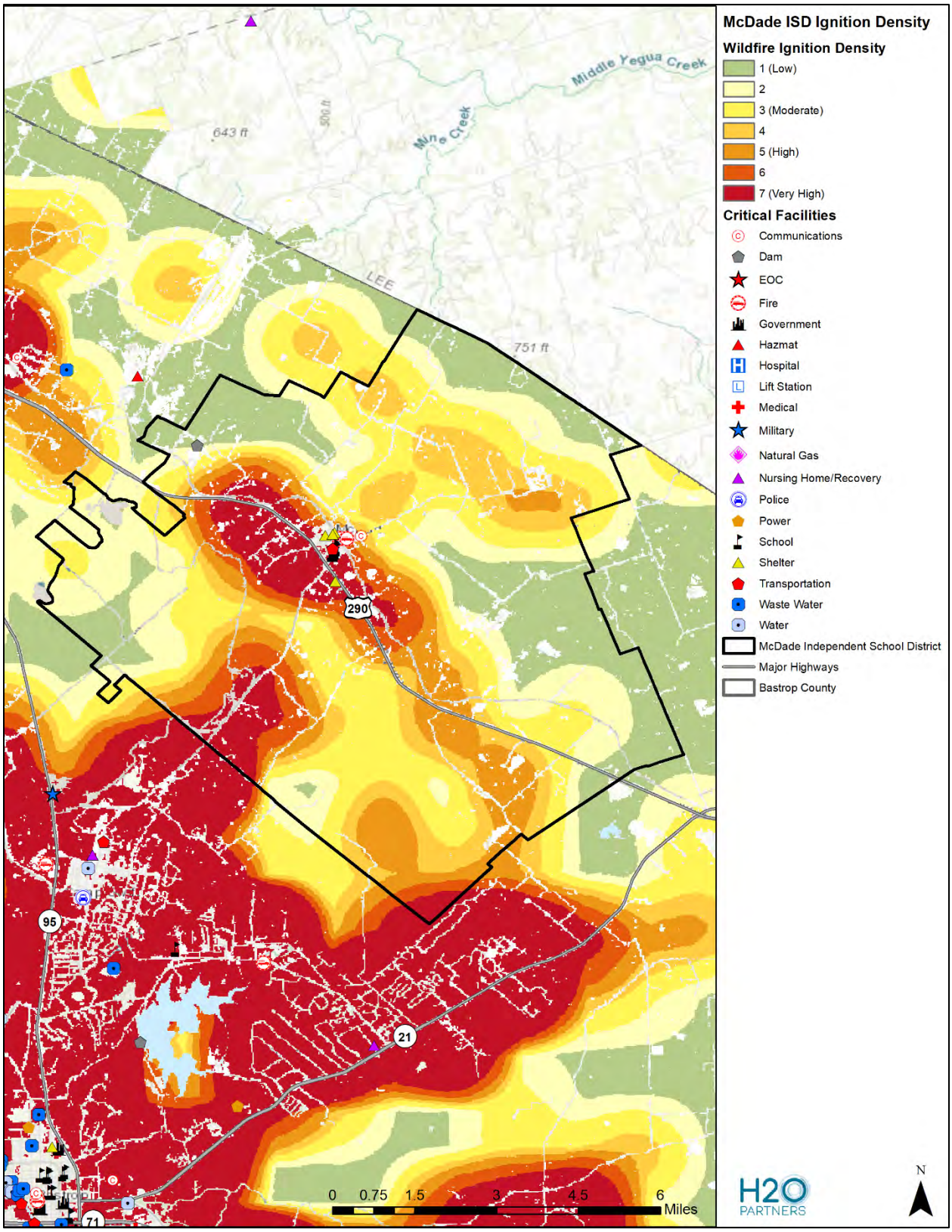


Figure 6-33. Wildfire Ignition Density – Bastrop County MUD #1

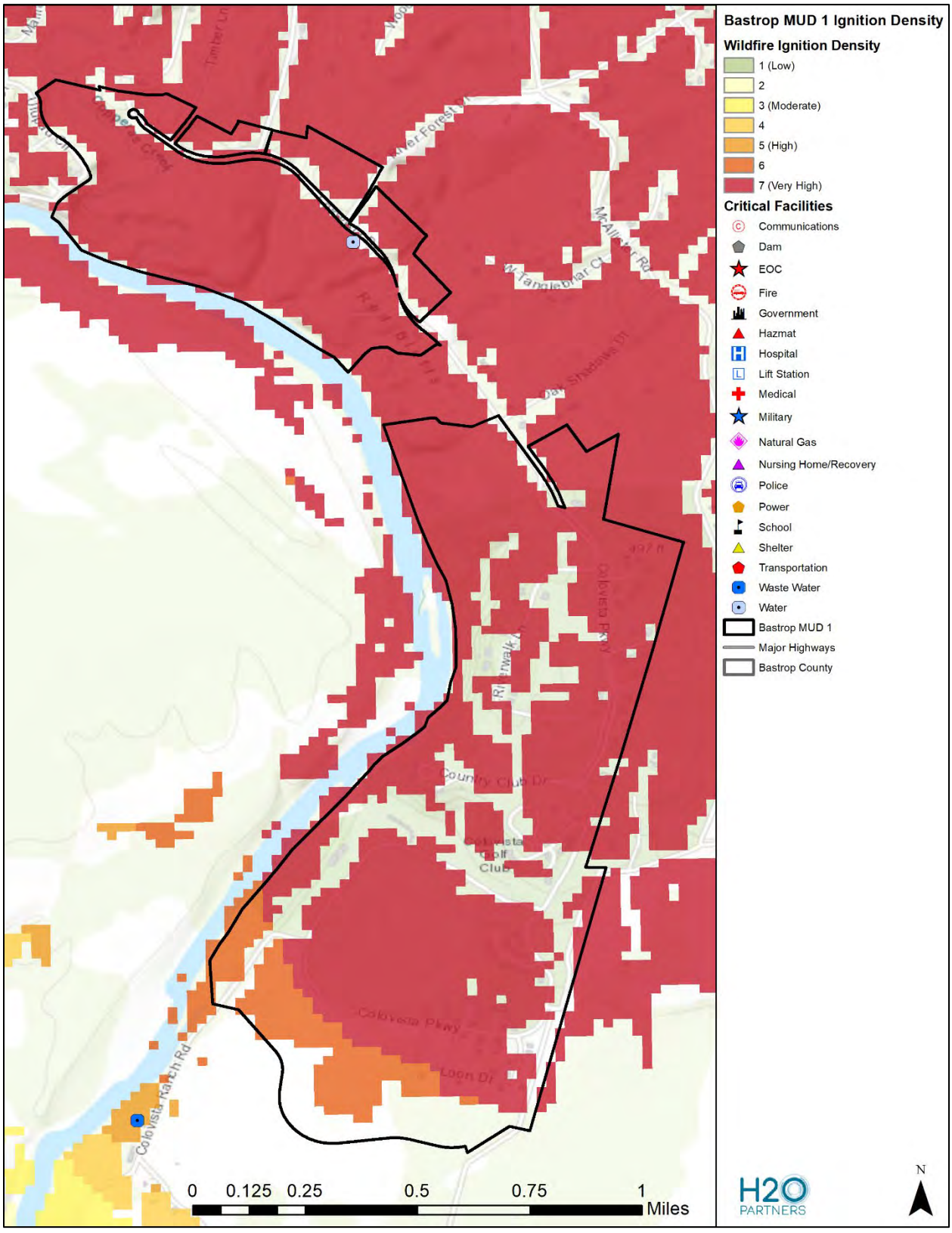


Figure 6-34. Wildfire Ignition Density – Bastrop County WCID #2

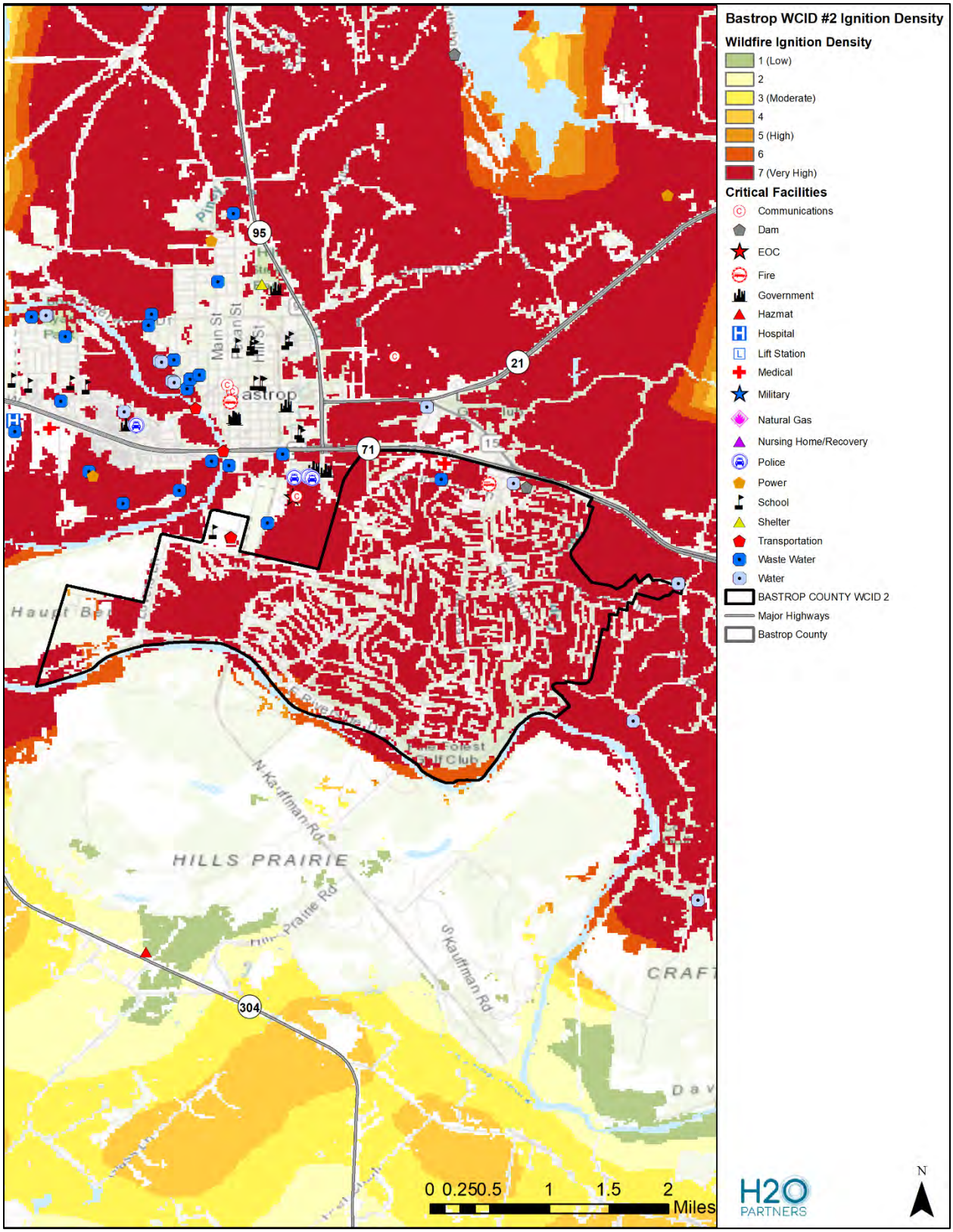
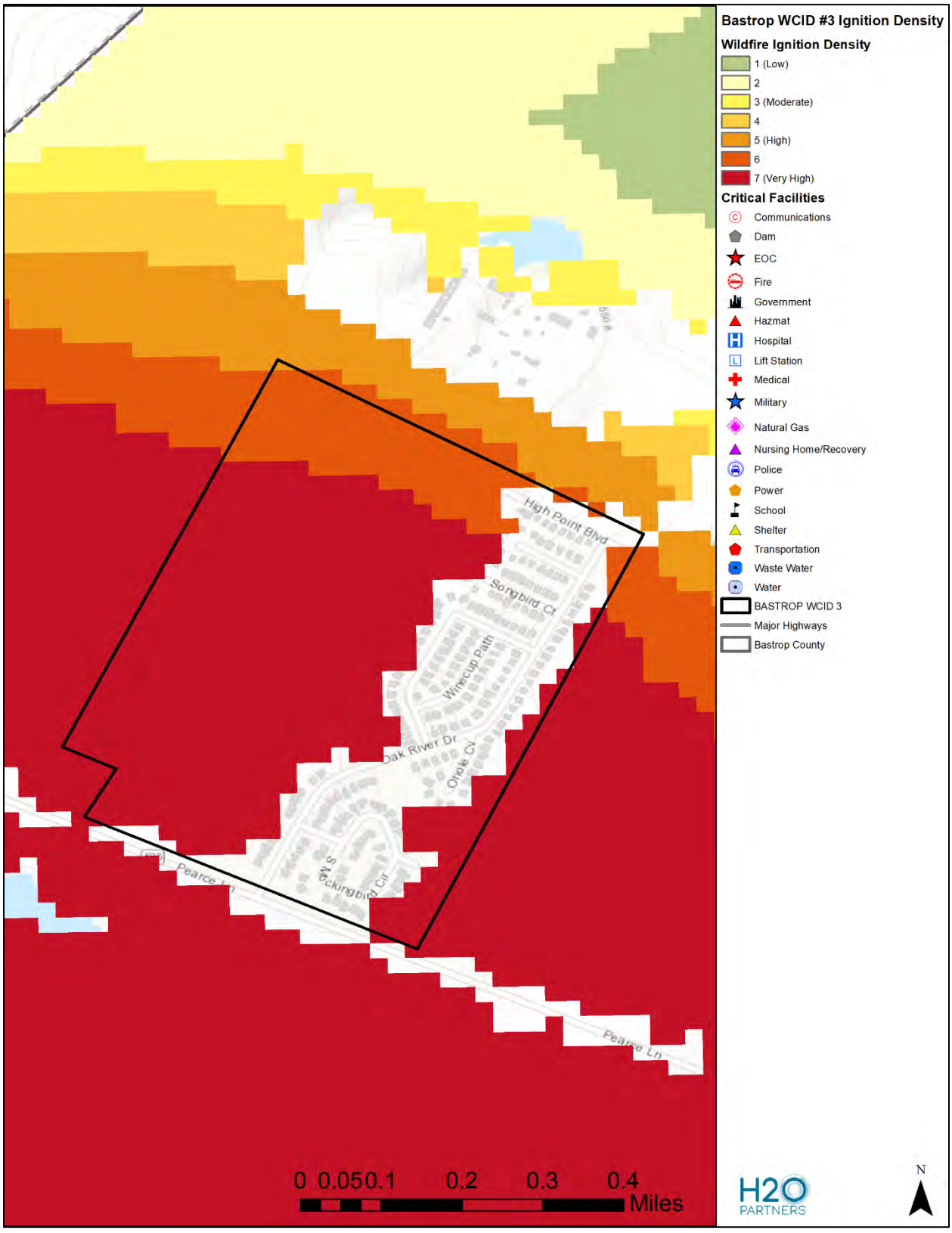


Figure 6-35. Wildfire Ignition Density – Bastrop County WCID #3



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

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

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

For the Bastrop County planning area, the impact from a wildfire event can be considered “minor," meaning injuries and illnesses do not result in permanent disability, a complete shutdown of critical facilities for more than one week, and more than 10 percent of property destroyed or with major damage. Severity of impact is gauged by acreage burned, homes and structures lost, injuries and fatalities. Based on this, impact for each participating jurisdiction is listed below in Table 6-5.

Table 6-5. Impact by Jurisdiction

JURISDICTION	IMPACT	DESCRIPTION
Bastrop County	Minor	Bastrop County has an estimated 65,312 people or 87.2 percent of the total population that live within the Wildland Urban Interface (WUI). Bastrop County, including citizens in unincorporated areas, could be injured or suffer illnesses treatable with first aid. Critical facilities could be shut down for one week or less and more than 10 percent of total property could be damaged.
City of Bastrop	Limited	The largest population in the City of Bastrop live in an area that is semi-dense (1-3 houses per 1 acre) in the WUI, and the City has a low to moderate wildfire threat. Citizens could be injured or suffer illnesses, but not permanent disability. Critical facilities could be shut down for 24 hours or less and less than 10 percent of total property could be damaged.
City of Elgin	Limited	The largest population in the City of Elgin live in an area that is semi-dense (1-3 houses per 1 acre) in the WUI, and the City has a low to moderate wildfire threat. Citizens could be injured or suffer illnesses, but not permanent disability. Critical facilities could be shut down for 24 hours or less and less than 10 percent of total property could be damaged.

JURISDICTION	IMPACT	DESCRIPTION
City of Smithville	Limited	The largest population in the City of Smithville live in an area that is semi-dense (1-3 houses per 1 acre) in the WUI, and the City has a low to moderate wildfire threat. Citizens could be injured or suffer illnesses, but not permanent disability. Critical facilities could be shut down for 24 hours or less and less than 10 percent of total property could be damaged.
Bastrop ISD	Limited	Nine Bastrop ISD facilities are located in close proximity or within the WUI and have a low to moderate threat to wildfire based on their location. Therefore, students and staff could be injured or suffer illnesses treatable with first aid. Critical facilities could be shut down for 24 hours or less and less than 10 percent of total property could be damaged.
Elgin ISD	Limited	Four Elgin ISD facilities are located in close proximity or within the WUI and have a low to moderate threat to wildfire based on their location. Therefore, students and staff could be injured or suffer illnesses treatable with first aid. Critical facilities could be shut down for 24 hours or less and less than 10 percent of total property could be damaged.
McDade ISD	Limited	Fifteen McDade ISD facilities are located in close proximity or within the WUI and have a low to moderate threat to wildfire based on their location. Therefore, students and staff could be injured or suffer illnesses treatable with first aid. Critical facilities could be shut down for 24 hours or less and less than 10 percent of total property could be damaged.
Smithville ISD	Limited	Three Smithville ISD facilities are located in close proximity or within the WUI and have a low to moderate threat to wildfire based on their location. Therefore, students and staff could be injured or suffer illnesses treatable with first aid. Critical facilities could be shut down for 24 hours or less and less than 10 percent of total property could be damaged.
Bastrop County MUD #1	Limited	The Bastrop County MUD #1 has one facility located in the WUI and has a low to moderate threat to wildfire based on their location. Therefore, staff could be injured or suffer illnesses treatable with first aid. Critical facilities could be shut down for 24 hours or less and less than 10 percent of total property could be damaged.

JURISDICTION	IMPACT	DESCRIPTION
Bastrop County WCID #2	Limited	The Bastrop County WCID #2 has one facility located in the WUI and has a low to moderate threat to wildfire based on their location. Therefore, staff could be injured or suffer illnesses treatable with first aid. Critical facilities could be shut down for 24 hours or less and less than 10 percent of total property could be damaged.
Bastrop County WCID #3	Limited	The Bastrop County WCID #3 has no facilities located in the WUI and has a low threat to wildfire based on their location. Therefore, staff could be injured or suffer illnesses treatable with first aid. Critical facilities could be shut down for 24 hours or less and less than 10 percent of total property could be damaged.

ASSESSMENT OF IMPACTS

A Wildfire event poses a potentially significant risk to public health and safety, particularly if the wildfire is initially unnoticed and spreads quickly. The impacts associated with a wildfire are not limited to the direct damages. Potential impacts for the planning area include:

- Persons in the area at the time of the fire are at risk for injury or death from burns and/or smoke inhalation.
- First responders are at greater risk of physical injury since they are in close proximity to the hazard while extinguishing flames, protecting property or evacuating residents in the area.
- First responders can experience heart disease, respiratory problems, and other long-term related illnesses from prolonged exposure to smoke, chemicals, and heat.
- Emergency services may be disrupted during a wildfire if facilities are impacted, roadways are inaccessible, or personnel are unable to report for duty.
- Critical city and/or county departments may not be able to function and provide necessary services depending on the location of the fire and the structures or personnel impacted.
- Non-critical businesses may be directly damaged, suffer loss of utility services, or be otherwise inaccessible, delaying normal operations and slowing the recovery process.
- Displaced residents may not be able to immediately return to work, further slowing economic recovery.
- Roadways in or near the WUI could be damaged or closed due to smoke and limited visibility.
- Older homes are generally exempt from modern building code requirements, which may require fire suppression equipment in the structure.
- Some high-density neighborhoods feature small lots with structures close together, increasing the potential for fire to spread rapidly.
- Air pollution from smoke may exacerbate respiratory problems of vulnerable residents.

- Charred ground after a wildfire cannot easily absorb rainwater, increasing the risk of flooding and potential mudflows.
- Wildfires can cause erosion, degrading stream water quality.
- Wildlife may be displaced or destroyed.
- Historical or cultural resources may be damaged or destroyed.
- Tourism can be significantly disrupted, further delaying economic recovery for the area.
- Vegetated dunes can be stripped, significantly damaging the function of the dunes to protect inland areas from the destructive forces of wind and waves.
- Economic disruption negatively impacts the programs and services provided by the community due to short- and long-term loss in revenue.
- Fire suppression costs can be substantial, exhausting the financial resources of the community.
- Residential structures lost in a wildfire may not be rebuilt for years, reducing the tax base for the community.
- At locations like Lake Bastrop or along the Colorado River, recreation and tourism can be unappealing for years following a large wildfire, devastating directly related businesses.
- Direct impacts to municipal water supply may occur through contamination of ash and debris during the fire, destruction of aboveground delivery lines, and soil erosion or debris deposits into waterways after the fire.

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

SECTION 7: EXTREME HEAT

Hazard Description 1
Location 1
Extent 1
Historical Occurrences 4
Probability of Future Events 6
Vulnerability and Impact 6
Assessment of Impacts 8

HAZARD DESCRIPTION



Extreme heat is a prolonged period of excessively high temperatures and exceptionally humid conditions. Extreme heat during the summer months is a common occurrence throughout the State of Texas, and Bastrop County is no exception. The entire planning area, including all participating jurisdictions, ISDs, and special districts, typically experience extended heat waves. A heat wave is an extended period of extreme heat and is often accompanied by high humidity.

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

LOCATION

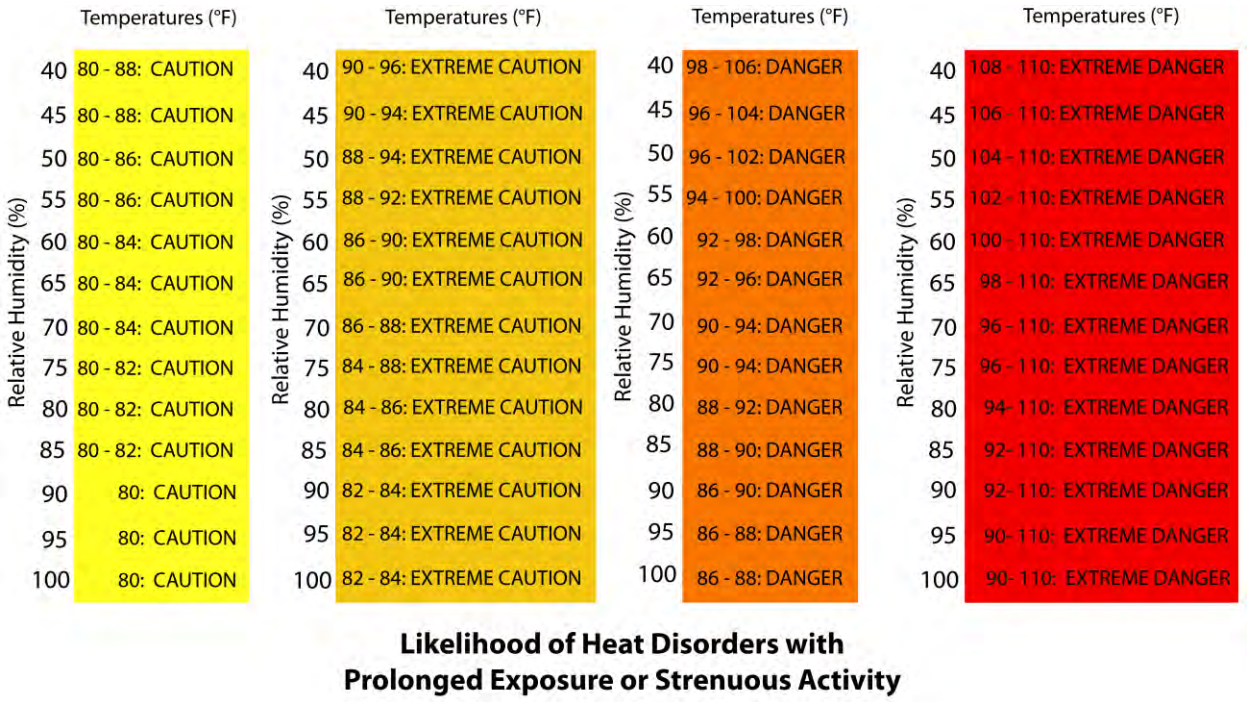
While there have been no deaths reported from extreme heat in the Planning Area, there is no specific geographic scope to the extreme heat hazard. Extreme heat could occur anywhere within the Bastrop County planning area, including all participating jurisdictions, ISDs, and special districts.

EXTENT

The magnitude or intensity of an extreme heat event is measured according to temperature in relation to the percentage of humidity. According to the National Oceanic Atmospheric Administration (NOAA), this relationship is referred to as the “Heat Index” and is depicted in Figure 7-1. This index measures how hot it feels outside when humidity is combined with high temperatures.

SECTION 7: EXTREME HEAT

Figure 7-1. Extent Scale for Extreme Summer Heat[1]



The Extent Scale in Figure 7-1 displays varying categories of caution depending on the relative humidity combined with the temperature. For example, when the temperature is at 90 degrees Fahrenheit (°F) or lower, caution should be exercised if the humidity level is at or above 40 percent.

The shaded zones on the chart indicate varying symptoms or disorders that could occur depending on the magnitude or intensity of the event. “Caution” is the first category of intensity, and it indicates when fatigue due to heat exposure is possible. “Extreme Caution” indicates that sunstroke, muscle cramps, or heat exhaustion are possible, and a “Danger” level means that these symptoms are likely. “Extreme Danger” indicates that heat stroke is likely. The National Weather Service (NWS) initiates alerts based on the Heat Index as shown in Table 7-1.

Table 7-1. Heat Index and Warnings

CATEGORY	HEAT INDEX	POSSIBLE HEAT DISORDERS	WARNING TYPE
Extreme Danger	125°F and higher	Heat stroke or sun stroke likely.	A heat advisory will be issued to warn that the Heat Index may exceed 105°F.
Danger	103 – 124°F	Sunstroke, muscle cramps, and/or heat exhaustion are likely. Heatstroke possible with prolonged exposure and/or physical activity.	
Extreme Caution	90 – 103°F	Sunstroke, muscle cramps, and/or heat exhaustion possible	An Excessive Heat Warning is issued if the Heat Index

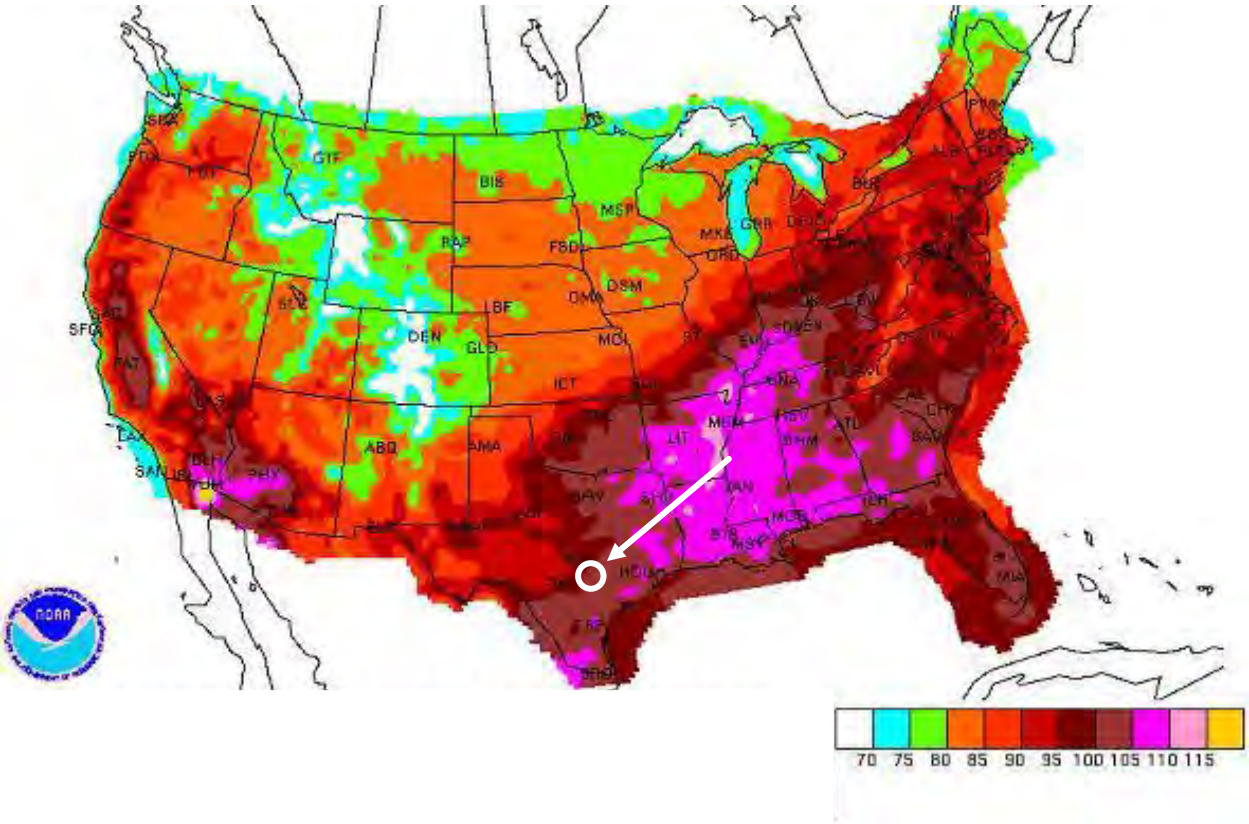
[1] Source: NOAA

CATEGORY	HEAT INDEX	POSSIBLE HEAT DISORDERS	WARNING TYPE
		with prolonged exposure and/or physical activity.	rises above 105°F at least 3 hours during the day or above 80°F at night.
Caution	80 – 90°F	Fatigue is possible with prolonged exposure and/or physical activity.	

Bastrop County comprises roughly 895 square miles of rolling uplands and broken hills with surface layers of primarily sandy, loamy soils, and woods where post oaks predominate but where cedar, hickory, elm, and walnut also occur. In the northwestern corner of the county and along the central southeastern border, the topography changes to blackland prairie with waxy clay soil and tall grass cover. The Colorado River bisects the county from northwest to southeast; along this waterway and its tributaries can be found rich alluvial silts and clays. Near the river, the Lost Pine Forest extends through an east central section of the county. Elevations range from 400 to 600 feet above sea level. The county's climate has been described as subtropical humid, with a low average January temperature of 40° F, a high average July temperature of 96° F, and an average annual rainfall of 37 inches; the growing season is 270 days long.

Figure 7-2 displays the daily maximum heat index as derived from NOAA based on data compiled from 1838 to 2015. The white circle shows the Bastrop County planning area. The dark red and brown color indicates a daily maximum heat index of 95° to 105°F. Bastrop County, including all participating jurisdictions, ISDs and special districts, could experience extreme heat from 90° to 105°F and should mitigate to the extent of “extreme caution,” which can include sunstroke, muscle cramps, and heat exhaustion.

Figure 7-2. Average Daily Maximum Heat Index Days[2]



HISTORICAL OCCURRENCES

Every summer, the hazard of heat-related illness becomes a significant public health issue throughout much of the US. Mortality from all causes increases during heat waves, and excessive heat is an important contributing factor to deaths from other causes, particularly among the elderly. Table 7-2 depicts historical occurrences of mortality from heat from 1994 to 2004 from the Texas Department of State Health Services and 2005 through June 2021 from the NCEI database.

Table 7-2. Extreme Heat Related Deaths in Texas

YEAR	DEATHS
1994	1
1995	12
1996	10
1997	2

[2] Source: NRDC and the white circle indicates the Bastrop County planning area.

YEAR	DEATHS
1998	66
1999	22
2000	71
2001	20
2002	1
2003	0
2004	3
2005	49
2006	2
2007	2
2008	7
2009	6
2010	4
2011	46
2012	3
2013	2
2014	0
2015	5
2016	6
2017	3
2018	2
2019	3
2020	2
2021	0

Because the Texas Department of State Health Services reports on total events statewide, previous occurrences for extreme heat are derived from the NCEI database. According to heat

related incidents located solely within Bastrop County, there are only two heat waves[3] on record for the Bastrop County planning area (Table 7-3). Historical extreme heat information, as provided by the NCEI, shows extreme heat activity across a multi-county forecast area for each event, the appropriate percentage of the total property and crop damage reported for the entire forecast area has been allocated to each county impacted by the event. Historical extreme heat data for all participating jurisdictions, ISDs, and special districts, are provided on a County-wide basis per the NCEI database. Only extreme heat events that have been reported have been factored into this Risk Assessment. It is highly likely additional extreme heat occurrences have gone unreported before and during the recording period. Due to the limited number of reported events, average high temperatures have been analyzed in order to determine the probability of future events.

Table 7-3. Historical Extreme Heat Events, 1997-2021[4]

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Bastrop County	7/20/2018	0	0	$0	$0
Bastrop County	7/13/2020	0	0	$0	$0
TOTALS		**0**	**0**	**$0**	**$0**

Based on the list of historical extreme heat events for the Bastrop County planning area (listed above) both of the reported events occurred since the 2016 Plan.

PROBABILITY OF FUTURE EVENTS

Average high temperatures for the planning area through the summer months indicate a probability of one event or more every year. This frequency supports a highly likely probability of future events.

VULNERABILITY AND IMPACT

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

Extreme temperatures do however present a significant threat to life and safety for the population of the County as a whole. Heat casualties for example are typically caused by a lack of adequate air-conditioning or heat exhaustion. The most vulnerable population to heat casualties are the elderly or infirmed who frequently live on low fixed incomes and cannot afford to run air-conditioning on a regular basis. This population is sometimes isolated, with no immediate family or friends to look out for their well-being. In addition, populations living below the poverty level are unable to run air-conditioning on a regular basis and are limited in their ability to seek medical

[3] Even though the County experiences heat waves each summer, NCEI data only records events reported. Based on reports, only two events are on record.
[4] Historical events are reported from January 1, 1996, through September 2021.

treatment. Another segment of the population at risk are those whose jobs consist of strenuous labor outdoors. Additionally, livestock and crops can become stressed, decreasing in quality or in production, during times of extreme heat.

Students in all of the Independent School Districts are also susceptible as sporting events and practices are often held outside during summer, early fall or late spring when temperatures are at the highest. Approximately 224 faculty or staff work outdoors for portions of the school day. All four ISDs include several athletic fields that may have ongoing athletic activities that would need to be closely monitored during extreme heat events.

All special districts participating in the planning process have approximately 17 staff members that work a portion of their workday outdoors and could be more susceptible to extreme heat that would need to be closely monitored (Table 7-4).

Table 7-4. Special District Populations at Greater Risk

JURISDICTION	POPULATIONS WORKING OUTDOORS
Bastrop ISD	70
Elgin ISD	45
McDade ISD	9
Smithville ISD	100
MUD #1	5
WCID #2	12
WCID #3	0

The population over 65 in the Bastrop County planning area is estimated at 14.6%, and the total population of children under the age of 5 are estimated at 6.5%, or an estimated total of 17,822[5] potentially vulnerable residents in the planning area based on age. In addition, an estimated 11.2% of the planning area population live below the poverty level (Table 7-5).

Table 7-5. Populations at Greater Risk by Jurisdiction[6]

JURISDICTION	POPULATION 65 AND OLDER	POPULATION UNDER 5	POPULATION BELOW POVERTY LEVEL
Bastrop County	12,303	5,519	9,466
City of Bastrop	1,555	812	1,158
City of Elgin	1,161	727	1,339

[5] U.S. Census Bureau 2019 data for Bastrop County

[6] ISD populations are also included in city data. Vulnerable populations are not applicable to special districts participating in the plan

JURISDICTION	POPULATION 65 AND OLDER	POPULATION UNDER 5	POPULATION BELOW POVERTY LEVEL
City of Smithville	1,060	246	393
Bastrop ISD	-	389	-
Elgin ISD	-	214	-
McDade ISD	-	14	-
Smithville ISD	-	60	-

Extreme high temperatures can have significant secondary impacts, leading to droughts, water shortages, increased fire danger, and prompt excessive demands for energy. The possibility of rolling blackouts increases with unseasonably high temperatures in what is a normally mild month with low power demands.

Typically more than 12 hours of warning time would be given before the onset of an extreme heat event. Only minor property damage would result. The potential impact of excessive summer heat is considered “limited” as injuries and/or illnesses would be treatable with first aid. In terms of vulnerability to structures, the impact from extreme heat would be negligible for the Bastrop County planning area, including all participating jurisdictions, ISDs, and special districts. It is possible that critical facilities and infrastructure could be shut down for 24 hours if cooling units are running constantly, leading to a temporary power outage. Less than ten percent of residential and commercial property could be damaged if extreme heat events lead to structure fires.

The potential impact of extreme heat for the entire Bastrop County planning area can be considered “limited,” resulting in few injuries and minimal disruption to the quality of life. Based on historical records over a 26-year period, annualized losses for the Bastrop County planning area are negligible.

ASSESSMENT OF IMPACTS

The greatest risk from extreme heat is to public health and safety. Potential impacts the community may include:

- Vulnerable populations, particularly the elderly, infants, children under five, can face serious or life-threatening health problems from exposure to extreme heat including hyperthermia, heat cramps, heat exhaustion, and heat stroke (or sunstroke).
- Residents that live below the poverty line are often more vulnerable as they may not have access to air conditioning.
- Response personnel, including utility workers, public works personnel, and any other professions where individuals are required to work outside, are more subject to extreme heat related illnesses since their exposure would typically be greater.
- High energy demand periods can outpace the supply of energy, potentially creating the need for rolling brownouts which would elevate the risk of illness to vulnerable residents.
- Highways and roads may be damaged by excessive heat causing asphalt roads to soften and concrete roads to shift or buckle.

- Vehicles engines and cooling systems typically run harder during extreme heat events resulting in increases in mechanical failures.
- Extreme heat events during times of drought can exacerbate the environmental impacts associated with drought, decreasing water and air quality and further degrading wildlife habitat.
- Extreme heat increases ground-level ozone (smog), increasing the risk of respiratory illnesses.
- Food suppliers can anticipate an increase in food costs due to increases in production costs and crop and livestock losses.
- Fisheries may be negatively impacted by extreme heat, suffering damage to fish habitats (either natural or man-made) and a loss of fish and/or other aquatic organisms due to decreased water flows or availability.
- Negatively impacted water suppliers may face increased costs resulting from the transport of water resources or development of supplemental water resources.
- Outdoor activities such as fishing, boating, and camping activities at Lake Bastrop or along the Colorado River may see an increase in injury or illness during extreme heat events.

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

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HAZARD DESCRIPTION



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

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

Table 8-1. Variations among Tornadoes

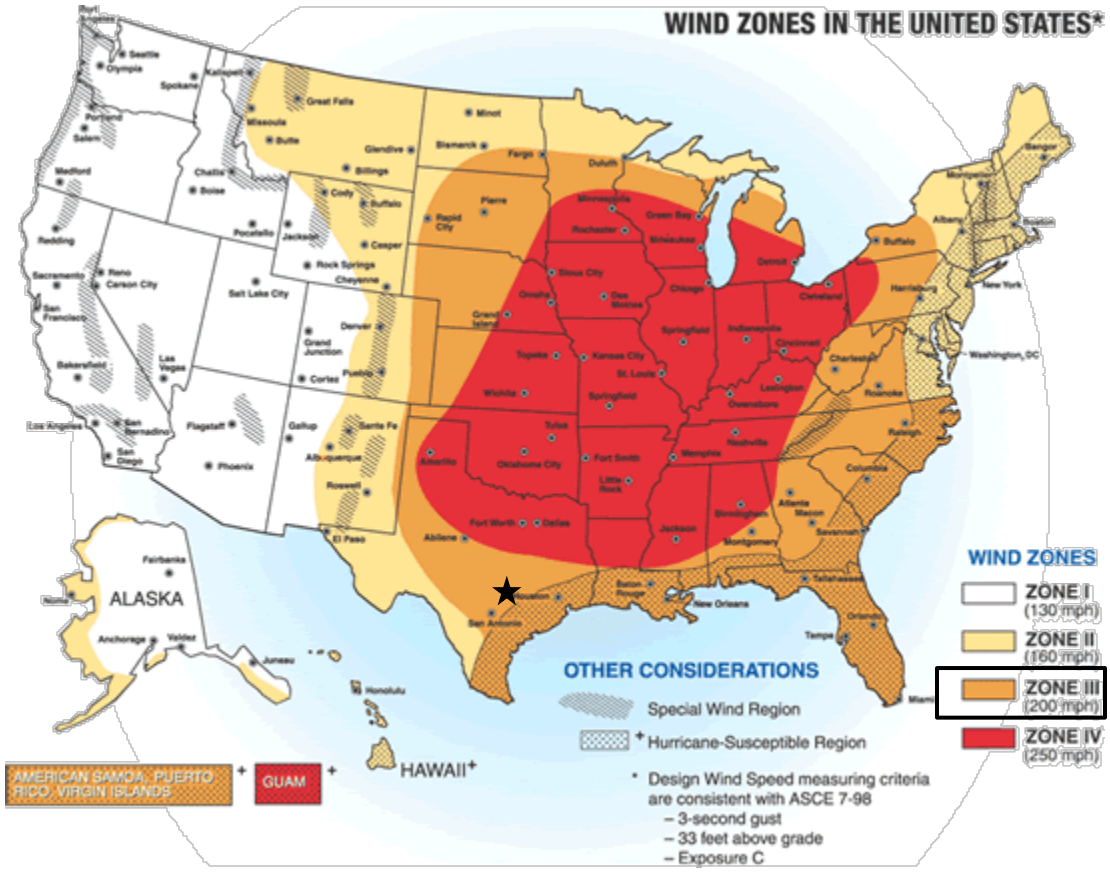
WEAK TORNADOES	STRONG TORNADOES	VIOLENT TORNADOES
• 69% of all tornadoes • Less than 5% of tornado deaths • Lifetime 1-10+ minutes • Winds less than 110 mph	• 29% of all tornadoes • Nearly 30% of all tornado deaths • May last 20 minutes or longer • Winds 110 – 205 mph	• 2% of all tornadoes • 70% of all tornado deaths • Lifetime can exceed one hour • Winds greater than 205 mph

LOCATION

Tornadoes do not have any specific geographic boundary and can occur throughout the Bastrop County planning area uniformly. It is assumed that the entire Bastrop County planning area

including all participating jurisdictions, ISDs, and special districts, are uniformly exposed to tornado activity. The entire Bastrop County planning area is located in Wind Zone III (Figure 8-1), where tornado winds can be as high as 200 mph.

Figure 8-1. FEMA Wind Zones in the United States[1]



EXTENT

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

[1] Bastrop County is indicated by the star.

Table 8-2. The Fujita Tornado Scale[2]

[2] Source: http://www.tornadoproject.com/fscale/fscale.htm

F-SCALE NUMBER	INTENSITY	WIND SPEED (MPH)	TYPE OF DAMAGE DONE	PERCENT OF APPRAISED STRUCTURE VALUE LOST DUE TO DAMAGE
F0	Gale Tornado	40 – 72	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages sign boards.	None Estimated
F1	Moderate Tornado	73 – 112	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off roads; attached garages may be destroyed.	0% – 20%
F2	Significant Tornado	113 – 157	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.	50% – 100%
F3	Severe Tornado	158 – 206	Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.	100%
F4	Devastating Tornado	207 – 260	Well-constructed homes leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.	100%
F5	Incredible Tornado	261 – 318	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles flying through the air in excess of 330 yards; trees debarked; steel reinforced concrete badly damaged.	100%

Tornado magnitudes prior to 2005 were determined using the traditional version of the Fujita Scale (Table 8-2). Since February 2007, the Fujita Scale has been replaced by the Enhanced Fujita Scale (Table 8-3), which retains the same basic design and six strength categories as the

previous scale. The newer scale reflects more refined assessments of tornado damage surveys, standardization, and damage consideration to a wider range of structures.

Table 8-3. Enhanced Fujita Scale for Tornadoes

STORM CATEGORY	DAMAGE LEVEL	3 SECOND GUST (MPH)	DESCRIPTION OF DAMAGES	PHOTO EXAMPLE
EF0	Gale	65 – 85	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages sign boards.	
EF1	Weak	86 – 110	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off roads; attached garages may be destroyed.	
EF2	Strong	111 – 135	Considerable damage; roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.	
EF3	Severe	136 – 165	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.	
EF4	Devastating	166 – 200	Well-constructed homes leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.	
EF5	Incredible	200+	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles flying through the air in excess of 330 yards; trees debarked; steel reinforced concrete badly damaged.	

Both the Fujita Scale and Enhanced Fujita Scale should be referenced in reviewing previous occurrences since tornado events prior to 2007 will follow the original Fujita Scale. The largest magnitude reported within the planning area is an F3 on the Fujita Scale, a “Severe Tornado.” Based on the planning area’s location in Wind Zone III, the planning area could experience anywhere from an EF0 to EF5 depending on the wind speed.

The events in Bastrop County have been between EF0 and EF4 (Table 8-4). Therefore, the range of intensity that the Bastrop County planning area, including all participating jurisdictions, ISDs, and special districts, would be expected to mitigate is a tornado event that would be a low to devastating risk, an EF0 to EF4. Historically, the planning area can anticipate a range of EF0 to EF4.

HISTORICAL OCCURRENCES

Only reported tornadoes were factored into the Risk Assessment. It is likely that a high number of occurrences have gone unreported over the past 69 years. Historical tornado data for the county, and all participating jurisdictions, ISDs, and special districts are provided within a jurisdiction-wide basis per the NCEI database.

Historical tornado data for the Bastrop ISD are provided within the Bastrop City-wide events per the NCEI database as they do not have events reported separate and apart from the reported City of Bastrop events. Similarly, Elgin ISD, McDade ISD and Smithville ISD events are reported within the city-wide events reported for their city location. There have been no reported losses as a result of tornados for any participating ISD.

Historical tornado data for the MUD #1, WCID #2 and WCID #3 are provided within the Bastrop County events per the NCEI database as they do not have events reported separate and apart from the reported county events. There have been no reported losses as a result of tornados and of the participating special districts.

Figure 8-2 identifies the locations of previous occurrences in the Bastrop County planning area from 1953 through September 2021. A total of 28 events have been recorded by the Storm Prediction Center (NOAA) and NCEI databases for the entire Bastrop County planning area, including all participating jurisdictions, ISDs, and special districts.

Figure 8-2. Spatial Historical Tornado Events, 1953-2021[3]

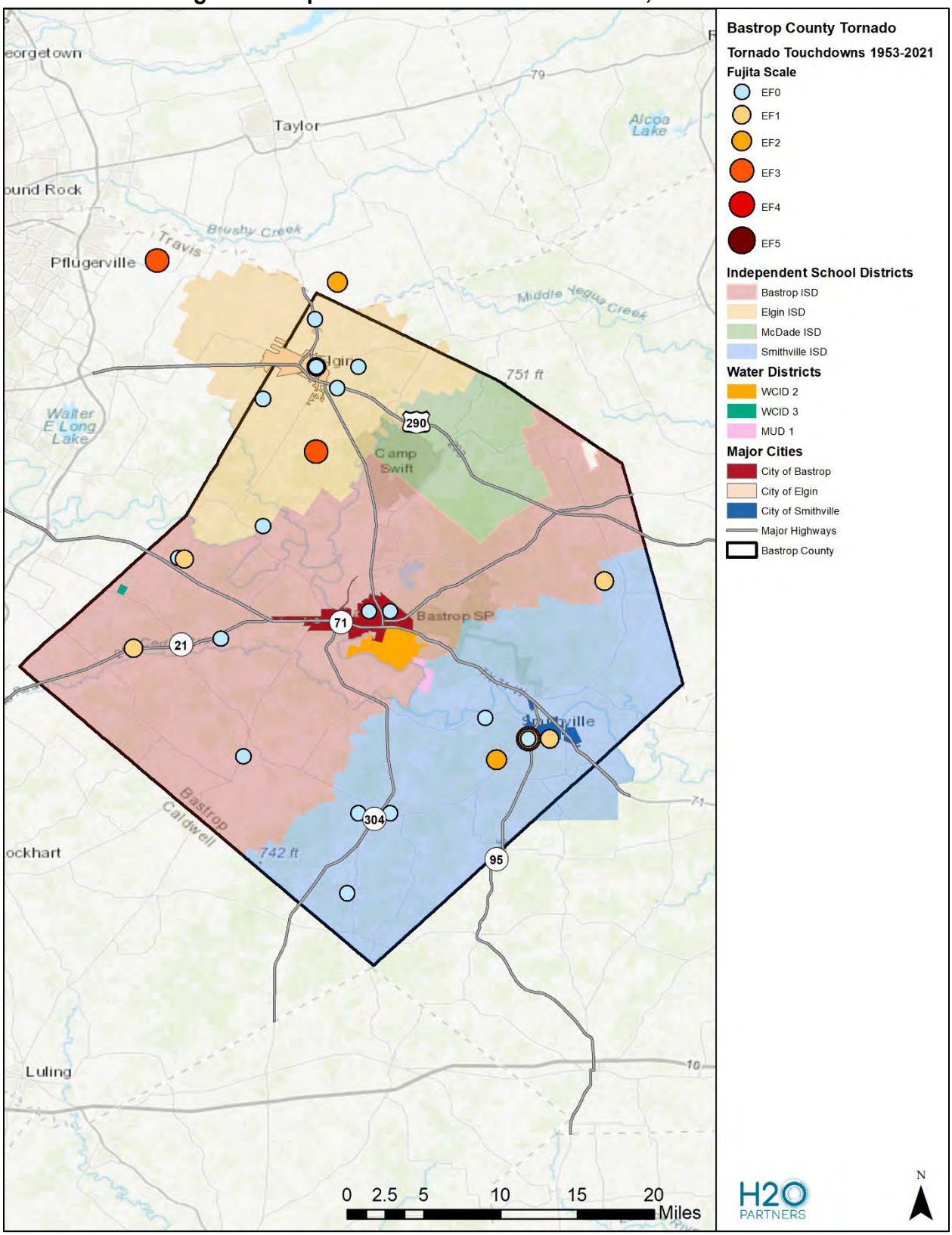


Table 8-4. Historical Tornado Events, 1953-2021[4]

JURISDICTION	DATE	TIME	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Bastrop County	4/28/1953	6:15 PM	F3	0	3	$247,194	$0
Bastrop County	5/19/1954	1:25 PM	Unavailable	0	0	$24,444	$0
Bastrop County	4/24/1957	2:20 PM	F3	0	1	$2,356,756	$0
Bastrop County	4/26/1957	2:30 AM	Unavailable	0	0	$23,568	$0
Bastrop County	5/18/1965	6:55 AM	F2	0	0	$20,941	$0
Bastrop County	11/17/1971	3:30 PM	F2	0	0	$1,607,665	$0
Bastrop County	3/20/1974	5:30 PM	F1	0	0	$13,756	$0
Bastrop County	5/2/1977	5:04 PM	Unavailable	0	0	$10,904	$0
Bastrop County	4/7/1980	5:50 PM	F3	0	0	$811,772	$0
Bastrop County	8/10/1980	1:30 PM	F0	0	0	$7,894	$0
Bastrop County	1/14/1991	5:50 PM	F0	0	0	$489	$0
Bastrop County	1/14/1991	6:14 PM	F2	0	0	$488,510	$0
Bastrop County	5/13/1994	1:45 PM	F0	0	0	$8,916	$8,916
Bastrop County	5/13/1994	2:15 PM	F0	0	0	$8,916	$8,916
City of Elgin	10/17/1998	12:30 PM	F1	0	1	$48,112	$0
City of Elgin	10/17/1998	1:10 PM	F1	0	0	$80,187	$0
Bastrop County	11/12/2000	1:50 PM	F0	0	0	$15,107	$0
City of Elgin	3/25/2005	10:02 PM	F0	0	0	$54,426	$0
Bastrop County	1/25/2012	5:30 AM	EF0	0	0	$5,802	$0
Bastrop County	5/26/2014	10:46 AM	EF0	0	0	$11,056	$0
Bastrop County	5/25/2015	3:24 PM	EF1	0	1	$1	$0
City of Elgin	5/23/2017	4:37 PM	EF0	0	0	$107,470	$0
City of Smithville	5/12/2020	9:54 AM	EF0	0	0	$51,291	$0
Bastrop County	5/28/2021	6:31 PM	EF0	0	0	$5,000	$0
TOTALS			**(Max Extent)**	**0**	**6**	**$6,010,177**	**$17,832**

[4] Only recorded events with fatalities, injuries or damages are listed. Magnitude is listed when available. Damage values are in 2021 dollars.

Table 8-5. Summary of Historical Events, 1953-2021[5]

JURISDICTION	Number of Events	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Bastrop County	28	F3	0	5	$5,668,691	$17,832
City of Bastrop	0	N/A	0	0	$0	$0
City of Elgin	5	F1	0	1	$290,195	$0
City of Smithville	1	EF0	0	0	$51,291	$0
TOTAL LOSSES	**34**	**(Max Extent)**	**0**	**6**	**$6,028,009**	

Based on the list of historical tornado events for the Bastrop County planning area (listed above) 6 of the events have occurred since the 2016 Plan.

SIGNIFICANT EVENTS

October 17, 1998 – City of Elgin

A very small and short-lived tornado struck briefly near Elgin. It destroyed a mobile home and knocked over several trees before lifting back into the parent thunderstorm. The only reported injury was to a baby in the mobile home.

May 25, 2015 – Bastrop County

A NWS storm survey team concluded a tornado touched down just west of Cedar Creek in Bastrop County. The tornado snapped and uprooted several trees. Twelve homes along the path of the tornado were damaged not including the barns and a large greenhouse destroyed. Peak winds were estimated at 105 mph.

PROBABILITY OF FUTURE EVENTS

Tornadic storms can occur at any time of year and at any time of day, but they are typically more common in the spring months during the late afternoon and evening hours. A smaller, high frequency period can emerge in the fall during the brief transition between the warm and cold seasons. According to historical records, Bastrop County, including all participating jurisdictions, ISDs, and special districts, can experience a tornado touchdown approximately once every one to two years. This frequency supports a likely probability of future events for Bastrop County, including all participating jurisdictions, ISDs, and special districts.

VULNERABILITY AND IMPACT

Because tornadoes often cross jurisdictional boundaries, all existing and future buildings, facilities, and populations in the entire Bastrop County planning area including all participating jurisdictions, ISDs, and special districts, are considered to be exposed to this hazard and could potentially be impacted. The damage caused by a tornado is typically a result of high wind velocity, wind-blown debris, lightning, and large hail.

[5] Damages reported in 2021 dollars.

SECTION 8: TORNADO

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

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

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

The Bastrop County planning area features multiple mobile or manufactured home parks throughout the planning area, including all participating jurisdictions. These parks are typically more vulnerable to tornado events than typical site-built structures. In addition, manufactured homes are located sporadically throughout the planning area including all participating jurisdictions and unincorporated areas of the county which would also be more vulnerable.

The portable buildings used at various locations within each participating ISD and special district, locations would be more vulnerable to tornado events than typical site-built structures and could potentially pose a greater risk for wind-blown debris. In addition, some of the ISD structures feature roof top Air Conditioning Units that would be vulnerable to high winds flying debris. These structures would also be more vulnerable. These units would also pose the additional threat of contributing to flying debris, causing additional damages to campus structures.

The US Census data indicates a total of 7,672 manufactured homes located in the Bastrop County planning area (25.5%), including all jurisdictions and unincorporated areas of the county (Table 8-6). In addition, 25.4% (approximately 7,612 structures) of the single family residential (SFR) structures in the entire planning area were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant tornado events.

Table 8-6. Structures at Greater Risk by Jurisdiction[6]

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Bastrop County[7]	7,672	7,612
City of Bastrop	42	950
City of Elgin	213	1,407
City of Smithville	200	1,227

[6] ISD facilities are included within the county and city totals.
[7] County totals includes all incorporated jurisdictions and unincorporated areas.

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Bastrop ISD	-	-
Elgin ISD	-	-
McDade ISD	-	-
Smithville ISD	-	-
Bastrop County MUD #1	0	3
Bastrop County WCID #2	0	1
Bastrop County WCID #3	0	0

The following critical facilities would be vulnerable to tornado events in each participating jurisdiction:

Table 8-7. Critical Facilities at Risk by Jurisdiction

JURISDICTION	CRITICAL FACILITIES
Bastrop County	1 Animal Shelter, 2 Cancer Research Facilities, 7 Communications Facilities, 1 County 911 Dispatch Facility, 8 Government Facilities, 1 Detention Facility, 4 Educational Facilities, 3 Electric Cooperative Facilities, 1 EOC, 1 Emergency Services Facility, 1 Prison Facility, 13 Fire Station Facilities, 1 Gas Storage Facility, 2 Hazardous Material Facilities, 4 Vulnerable Population Residential Facilities, 4 Emergency Medical Facilities, 1 Military Training Facility, 1 Pipeline Transportation Facility, 1 Power Distribution Facility, 2 Power Generation Facilities, 2 Propane Distribution Facilities, 1 Rail Yard Facility, 4 Government Storage Facilities, 1 School Bus Transport Facility, 1 Sheriff's Office, 2 DOT Program Facilities, 1 Wastewater Treatment Plant, 2 Water Facilities
City of Bastrop	2 Bridges, 1 Government Facility, 2 Communications Facility, 1 Corrections Facility, 6 Educational Facilities, 2 Electric Substations, 1 Emergency Shelter, 2 Fire Station Facilities, 2 Emergency Medical Facilities, 2 Police Station Facilities (including 911 Center), 1 Government Storage Facility, 19 Wastewater Lift Stations, 2 Wastewater Treatment Facilities, 12 Water Well Facilities
City of Elgin	1 Emergency Evacuation Center, 1 Helicopter Landing Pad, 1 Emergency Medical Facility, 1 Police Station, 1 Fire Station, 1 Water Treatment Facility
City of Smithville	1 Government Facility, 1 Government Storage Facility, 2 Chemical Storage Facilities, 1 Communications Facility, 1 Emergency Shelter, 2 Fire Stations, 1 Municipal Airport, 1 Police

JURISDICTION	CRITICAL FACILITIES
	Station, 3 Pump Stations, 2 Wastewater Chemical Facilities, 4 Wastewater Treatment Facilities, 1 Water System Facility, 6 Water Storage Facilities, 3 Water Well Facilities
Bastrop ISD	14 School Campus Locations (All facilities including schools, administration facilities, maintenance and operations facilities, service center, stadium, technology building, and transportation facility)
Elgin ISD	7 School Campus Locations (All facilities including schools, administration facilities, development center, maintenance and operations, nutrition services facility, technology building, and transportation facility)
McDade ISD	4 School Campus Locations (All facilities including schools, administration facilities, AG shop facility, band hall, maintenance and operations, nutrition services facility, technology building, and transportation facility)
Smithville ISD	4 School Campus Locations (All facilities including schools, administration facilities, and maintenance and operations facilities)
Bastrop County MUD #1	11 Services Office, 1 Operations Center, 1 Operations and Maintenance Firm, 1 Wastewater Plant, 1 Water Plant, 1 Water Facility, All Pipeline Infrastructure
Bastrop County WCID#2	1 Water Well and Pumping Station, All Pipeline Infrastructure
Bastrop County WCID#3	None

All participating ISDs face additional risk from tornado damages. District building damages or power outages could make the schools unsafe for students to attend. Each ISD would also have to consider the safety of the students during transportation to and from the schools, especially if widespread road closures result from the debris produced by tornadoes.

Special districts participating in the plan could face loss of critical functions due to a tornado event as well as placing employees in harm's way following event to restore services.

The average loss estimate of property and crop is $6,028,009 (in 2021 dollars), having an approximate annual loss estimate of $87,362 (Table 8-8). Based on historic loss and damages, the impact of tornado on the Bastrop County planning area, including all participating jurisdictions, ISDs, and special districts, can be considered "Limited," with less than 10 percent of property expected to be destroyed, injuries that are treatable with first aid, and critical facilities shut down for 24 hours or less.

Annualized losses are not included for participating ISDs as there have not been events or losses to affect the Independent School Districts separate and apart from a historical occurrence in the city which they are located. Similarly, there have been no reported losses for any of the participating special districts separate and apart from their jurisdictional locations (see historical events above).

Table 8-8. Potential Annualized Losses by Jurisdiction

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Bastrop County	$5,686,523	$82,413
City of Bastrop	$0	$0
City of Elgin	$290,195	$4,206
City of Smithville	$51,291	$743
Planning Area	**$6,028,009**	**$87,362**

ASSESSMENT OF IMPACTS

Tornadoes have the potential to pose a significant risk to the population and can create dangerous situations. Often times, providing and preserving public health and safety is difficult. Impacts to the planning area can include:

- Individuals exposed to the storm can be struck by flying debris, falling limbs, or downed trees causing serious injury or death.
- Structures can be damaged or crushed by falling trees, which can result in physical harm to the occupants.
- Manufactured homes may suffer substantial damage as they would be more vulnerable than typical site-built structures.
- Significant debris and downed trees can result in emergency response vehicles being unable to access areas of the community.
- Downed power lines may result in roadways being unsafe for use, which may prevent first responders from answering calls for assistance or rescue.
- Tornadoes often result in widespread power outages increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.
- Extended power outages can result in an increase in structure fires and/or carbon monoxide poisoning as individuals attempt to cook or heat their home with alternate, unsafe cooking or heating devices, such as grills.
- Tornadoes can destroy or make residential structures uninhabitable, requiring shelter or relocation of residents in the aftermath of the event.
- First responders must enter the damage area shortly after the tornado passes to begin rescue operations and to organize cleanup and assessments efforts, therefore they are exposed to downed power lines, unstable and unusual debris, hazardous materials, and generally unsafe conditions, elevating the risk of injury to first responders and potentially diminishing emergency response capabilities.
- Emergency operations and services may be significantly impacted due to damaged facilities, loss of communications, and damaged emergency vehicles and equipment.
- City or county departments may be damaged or destroyed, delaying response and recovery efforts for the entire community.

- Private sector entities that the City and its residents rely on, such as utility providers, financial institutions, and medical care providers may not be fully operational and may require assistance from neighboring communities until full services can be restored.
- Economic disruption negatively impacts the programs and services provided by the community due to short- and long-term loss in revenue.
- Damage to infrastructure may slow economic recovery since repairs may be extensive and lengthy.
- Some businesses not directly damaged by the tornado may be negatively impacted while roads and utilities are being restored, further slowing economic recovery.
- When the community is affected by significant property damage it is anticipated that funding would be required for infrastructure repair and restoration, temporary services and facilities, overtime pay for responders, and normal day-to-day operating expenses.
- Displaced residents may not be able to immediately return to work, further slowing economic recovery.
- Residential structures destroyed by a tornado may not be rebuilt for years, reducing the tax base for the community.
- Large or intense tornadoes may result in a dramatic population fluctuation, as people are unable to return to their homes or jobs and must seek shelter and/or work outside of the affected area.
- Businesses that are uninsured or underinsured may have difficulty reopening, which results in a net loss of jobs for the community and a potential increase in the unemployment rate.
- Recreation activities may be unavailable, and tourism can be unappealing for years following a large tornado, devastating directly related local businesses.

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

SECTION 9: DROUGHT

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HAZARD DESCRIPTION



Drought is a period of time without substantial rainfall that persists from one year to the next. Drought is a normal part of virtually all climatic regions, including areas with high and low average rainfall. Drought is the consequence of anticipated natural precipitation reduction over an extended period of time, usually a season or more in length. Droughts can be classified as meteorological, hydrologic, agricultural, and socioeconomic. Table 9-1 presents definitions for these different types of drought.

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

Table 9-1. Drought Classification Definitions[1]

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

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

LOCATION

Droughts occur regularly throughout Texas and the Bastrop County planning area and are a normal condition. However, they can vary greatly in their intensity and duration. The Drought Monitor shows the planning area is currently experiencing abnormally dry conditions throughout the county (Figure 9-1). However, the planning area has experienced normal conditions to exceptional drought conditions over the last twenty years (Figure 9-2). There is no distinct geographic boundary to drought; therefore, it can occur throughout the Bastrop County planning area equally, including all participating jurisdictions, ISDs, and special districts.

Figure 9-1. U.S. Drought Monitor, October 2022

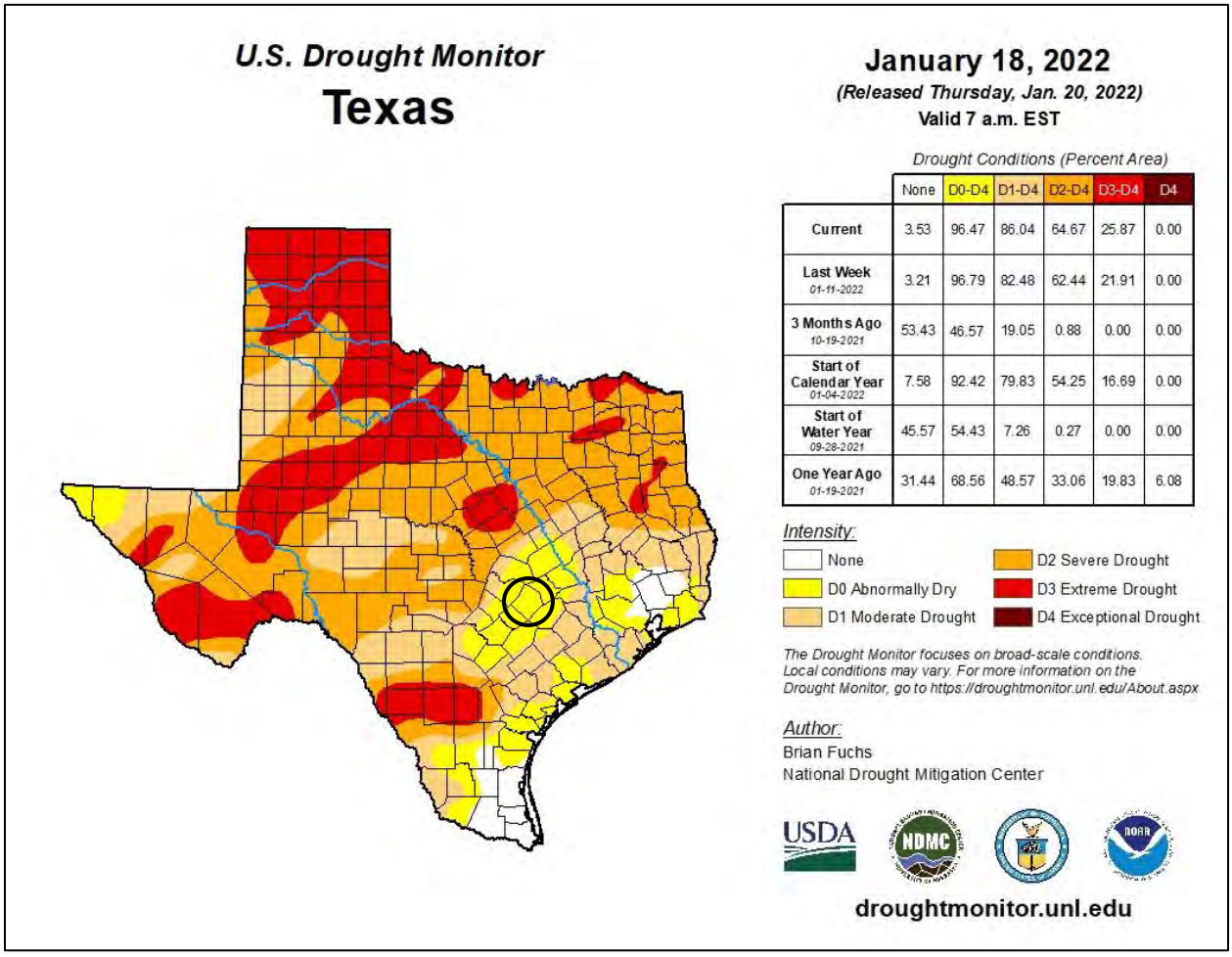
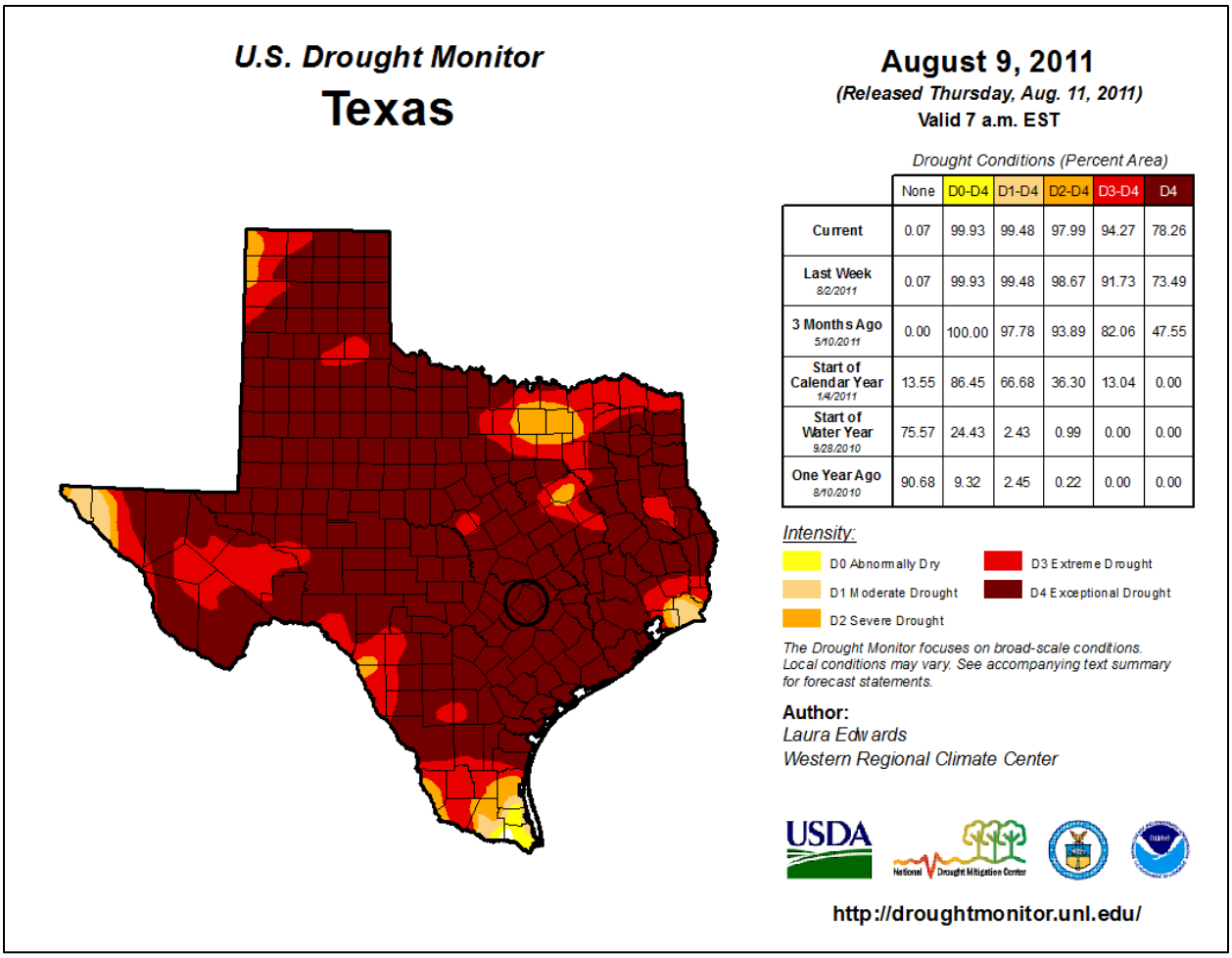


Figure 9-2. U.S. Drought Monitor, August 2011



EXTENT

The Palmer Drought Index is used to measure the extent of drought by measuring the duration and intensity of long-term drought-inducing circulation patterns. Long-term drought is cumulative, with the intensity of drought during the current month dependent upon the current weather patterns plus the cumulative patterns of previous months. The hydrological impacts of drought (e.g., reservoir levels, groundwater levels, etc.) take longer to develop. Table 9-2 depicts magnitude of drought, while Table 9-3 describes the classification descriptions.

Table 9-2. Palmer Drought Index

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

Meteorological	-4.00 and below	-3.00 to -3.99	-2.00 to -2.99	-1.99 to +1.99	+2.00 to +2.99	+3.00 to +3.99	+4.00 and above
Hydrological	-4.00 and below	-3.00 to -3.99	-2.00 to -2.99	-1.99 to +1.99	+2.00 to +2.99	+3.00 to +3.99	+4.00 and above

Table 9-3. Palmer Drought Category Descriptions[2]

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

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

Based on the historical occurrences for drought and the location of the Bastrop County planning area, including all participating jurisdictions, ISDs, and special districts, the area can anticipate a range of drought from abnormally dry to exceptional, or D0 to D4, based on the Palmer Drought Category.

[2] Source: National Drought Mitigation Center

HISTORICAL OCCURRENCES

The Bastrop County planning area may typically experience a severe drought. Table 9-4 and 9-5 list historical events that have occurred in the Bastrop County planning area as reported in the National Centers for Environmental Information (NCEI). Historical drought information shows drought activity across a multi-county forecast area for each event, the appropriate percentage of the total property and crop damage reported for the entire forecast area has been allocated to each county impacted by the event. Historical drought data for all participating jurisdictions, ISDs and special districts in the Bastrop County planning area are provided on a county-wide basis per the NCEI database.

Table 9-4. Historical Drought Years, 1996-2021

DROUGHT YEAR
1996
2000
2011-2012
2012
2013
2014
2015
2019
2020-2021
11 unique events

Table 9-5. Historical Drought Events, 1996-2021[3]

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Bastrop County	4/1/1996	0	0	$0	$0
Bastrop County	5/1/1996	0	0	$0	$0
Bastrop County	6/1/1996	0	0	$0	$0
Bastrop County	7/1/1996	0	0	$0	$0
Bastrop County	8/1/1996	0	0	$0	$0
Bastrop County	7/1/2000	0	0	$0	$0
Bastrop County	8/1/2000	0	0	$0	$0

[3] Events are reported from January 1, 1996, through September 2021

SECTION 9: DROUGHT

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Bastrop County	9/1/2000	0	0	$0	$0
Bastrop County	10/1/2000	0	0	$0	$0
Bastrop County	5/1/2011	0	0	$0	$0
Bastrop County	6/1/2011	0	0	$0	$0
Bastrop County	7/1/2011	0	0	$0	$0
Bastrop County	8/1/2011	0	0	$0	$0
Bastrop County	9/1/2011	0	0	$0	$0
Bastrop County	10/1/2011	0	0	$0	$0
Bastrop County	11/1/2011	0	0	$0	$0
Bastrop County	12/1/2011	0	0	$0	$0
Bastrop County	1/1/2012	0	0	$0	$0
Bastrop County	2/1/2012	0	0	$0	$0
Bastrop County	12/1/2012	0	0	$0	$0
Bastrop County	2/1/2013	0	0	$0	$0
Bastrop County	3/1/2013	0	0	$0	$0
Bastrop County	4/1/2013	0	0	$0	$0
Bastrop County	5/1/2013	0	0	$0	$0
Bastrop County	6/1/2013	0	0	$0	$0
Bastrop County	7/1/2013	0	0	$0	$0
Bastrop County	8/1/2013	0	0	$0	$0
Bastrop County	8/1/2014	0	0	$0	$0
Bastrop County	10/1/2015	0	0	$0	$0
Bastrop County	10/1/2019	0	0	$0	$0
Bastrop County	11/1/2019	0	0	$0	$0
Bastrop County	11/1/2020	0	0	$0	$0
Bastrop County	12/1/2020	0	0	$0	$0
Bastrop County	1/1/2021	0	0	$0	$0
TOTALS		**0**	**0**	**$0**	**$0**

Based on the list of historical drought events for the Bastrop County planning area (listed above) 6 events over 3 periods have occurred since the 2016 Plan.

SIGNIFICANT EVENTS

May 2011 – January 2012

Most of the area was in exceptional drought conditions (Stage D4). Fire danger in South Central Texas remained moderate to high and burn bans were in effect for all of the counties. The Texas A&M agricultural program report indicated the agricultural situation was rapidly deteriorating. Forage availability remained below average. Many stock tanks remained extremely low and some were in danger of drying up. The Texas State Climatologist declared the current drought as the most severe one-year drought ever for Texas. The Texas A&M agricultural program report indicated the region remained almost completely dry with respect to crops and in wildfire alert status. Many stock tanks were dry and water levels of some wells were low. Ranchers continued to provide supplemental feeding for livestock.

The La Nina event continued during January 2012 according to the Climate Prediction Center. There were several significant rainfall events during the month with precipitation ranging from around one-half inch across the Rio Grande Plains. Due to recent rain, fire danger was low to moderate by the end of January and only 14 counties still had burn bans in effect. The Texas A&M Crop and Weather report stated soil-moisture levels improved greatly and stock ponds were filled where the rains were heavy over the eastern counties. At the end of the month of January the seven-day stream flow average improved to the normal/below normal range for basins across South Central Texas and the Rio Grande Plains.

PROBABILITY OF FUTURE EVENTS

Based on available records of historic events, there have been nine extended time periods of drought (ranging in length from approximately 30 days to over 300 days) within a 26-year reporting period, which provides a probability of one event every two to three years. This frequency supports a likely probability of future events for the entire Bastrop County planning area, including all participating jurisdictions, ISDs, and special districts. All participating jurisdictions and special district events are included under the County.

VULNERABILITY AND IMPACT

Loss estimates were based on 26 years of statistical data from the NCEI. A drought event frequency-impact was then developed to determine an impact profile on agriculture products and estimate potential losses due to drought in the area. Table 9-6 shows annualized exposure.

Table 9-6. Potential Annualized Losses for Bastrop County

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Bastrop County	$0	$0

Drought impacts large areas and crosses jurisdictional boundaries. All existing and future buildings, facilities, and populations are exposed to this hazard and could potentially be impacted. However, drought impacts are mostly experienced in water shortages and crop/livestock losses on agricultural lands and typically have no impact on buildings.

In terms of vulnerability, population, agriculture, property, socioeconomics and environment are all vulnerable to drought in the Bastrop County planning area, including all participating jurisdictions, ISDs, and special districts. Typical demand can deplete water resources during extreme drought conditions. As resources are depleted, potable water is in short supply and overall water quality can suffer, elevating health concerns for all residents but especially vulnerable populations – typically children, the elderly, and the ill. In addition, potable water is used for drinking, sanitation, patient care, sterilization, equipment, heating and cooling systems, and many other essential functions in medical facilities.

The average person will survive only a few days without potable water, and this timeframe can be drastically shortened for those people with more fragile health – typically children, the elderly, and the ill. Population over 65 in the Bastrop County planning area is estimated at 14.6% of the total population, and children under the age of 5 are estimated at 6.5% or an estimated total of 17,822[4] potentially vulnerable residents in the planning area based on age. In addition, an estimated 11.2% of planning area population live below the poverty level (Table 9-7) which may contribute to overall health impacts of a drought.

Table 9-7. Populations at Greater Risk by Jurisdiction[5]

JURISDICTION	POPULATION 65 AND OLDER	POPULATION UNDER 5	POPULATION BELOW POVERTY LEVEL
Bastrop County	12,303	5,519	9,466
City of Bastrop	1,555	812	1,158
City of Elgin	1,161	727	1,339
City of Smithville	1,060	246	393
Bastrop ISD	-	389	-
Elgin ISD	-	214	-
McDade ISD	-	14	-
Smithville ISD	-	60	-

The population is also vulnerable to food shortages when drought conditions exist, and potable water is in short supply. Potable water is used for drinking, sanitation, patient care, sterilization, equipment, heating and cooling systems, and many other essential functions in medical facilities. All residents in the entire Bastrop County planning area could be adversely affected by drought conditions, which could limit water supplies and present health threats. During summer drought, or hot and dry conditions, elderly persons, small children, infants and the chronically ill who do not have adequate cooling units in their homes may become more vulnerable to injury and/or death.

[4] US Census Bureau 2019 data for Bastrop County

[5] ISD populations are also included in city data. Vulnerable populations are not applicable to special districts participating in the plan

Students and faculty in all participating ISDs are also vulnerable to drought, however, elementary facilities are considered more vulnerable due to their higher population of small children. Outdoor athletic activities or events at all campus facilities may increase the risk to participating students and faculty. All participating ISDs have multiple athletic fields that may have ongoing athletic activities that would need to be closely monitored during droughts.

Participating special districts do not have specific populations vulnerable to drought.

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

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

Impact of droughts experienced in the Bastrop County planning area, including all participating jurisdictions, ISDs, and special districts, has resulted in no injuries or fatalities supporting a "Limited" severity of impact meaning injuries and/or illnesses are treatable with first aid, shutdown of facilities and services for 24 hours or less, and less than 10% of property is destroyed or with major damage. Annualized loss over the 26-year reporting period in the Bastrop County planning area is considered negligible.

ASSESSMENT OF IMPACTS

The Drought Impact Reporter was developed in 2005 by the University of Nebraska-Lincoln to provide a national database of drought impacts. Droughts can have an impact on: the agriculture; business and industry; energy; fire; plants and wildlife; relief, response, and restrictions; society and public health; tourism and recreation; and water supply and quality. The reports are submitted from individuals from Federal, State, and local agencies, as well as the general public. Table 9-8 lists the drought impacts to Bastrop County from January 2005 through December 2021 based on reports received by the Drought Impact Reporter.

Table 9-8. Drought Impacts, 2005-2021

DROUGHT IMPACTS 2005-2019	
Agriculture	83
Business & Industry	2
Energy	2
Fire	33
Plants & Wildlife	57
Relief, Response & Restrictions	46
Society & Public Health	4

SECTION 9: DROUGHT

DROUGHT IMPACTS 2005-2019	
Tourism & Recreation	1
Water Supply & Quality	39

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

- The number of health-related low-flow issues (e.g., diminished sewage flows, increased pollution concentrations, reduced firefighting capacity, and cross-connection contamination) will increase as the drought intensifies.
- Public safety from forest/range/wildfires will increase as water availability and/or pressure decreases.
- Respiratory ailments may increase as the air quality decreases.
- There may be an increase in disease due to wildlife concentrations (e.g., rabies, Rocky Mountain spotted fever, Lyme disease).
- Jurisdictions and residents may disagree over water use/water rights, creating conflict.
- Political conflicts may increase between municipalities, counties, states, and regions.
- Water management conflicts may arise between competing interests.
- Increased law enforcement activities may be required to enforce water restrictions.
- Severe water shortages could result in inadequate supply for human needs as well as lower quality of water for consumption.
- Firefighters may have limited water resources to aid in firefighting and suppression activities, increasing risk to lives and property.
- During drought there is an increased risk for wildfires and dust storms.
- The community may need increased operational costs to enforce water restriction or rationing.
- Prolonged drought can lead to increases in illness and disease related to drought.
- Utility providers can see decreases in revenue as water supplies diminish.
- Utilities providers may cut back energy generation and service to their customers to prioritize critical service needs.
- Hydroelectric power generation facilities and infrastructure would have significantly diminished generation capability. Dams simply cannot produce as much electricity from low water levels as they can from high water levels.
- Fish and wildlife food and habitat will be reduced or degraded over time during a drought and disease will increase, especially for aquatic life.
- Wildlife will move to more sustainable locations creating higher concentrations of wildlife in smaller areas, increasing vulnerability and further depleting limited natural resources.
- Severe and prolonged drought can result in the reduction of a species or cause the extinction of a species altogether.

- Plant life will suffer from long-term drought. Wind and erosion will also pose a threat to plant life as soil quality will decline.
- Dry and dead vegetation will increase the risk of wildfire.
- Drought poses a significant risk to annual and perennial crop production and overall crop quality leading to higher food costs.
- Drought related declines in production may lead to an increase in unemployment.
- Drought may limit livestock grazing resulting in decreased livestock weight, potential increased livestock mortality, and increased cost for feed.
- Negatively impacted water suppliers may face increased costs resulting from the transport water or develop supplemental water resources.
- Long term drought may negatively impact future economic development.

The overall extent of damages caused by periods of drought is dependent on its extent and duration. The level of preparedness and pre-event planning done by government, businesses, and citizens will contribute to the overall economic and financial conditions in the aftermath of a drought event.

SECTION 10: HURRICANE / TROPICAL STORM WIND

Hazard Description 1
Location 1
Extent 2
Historical Occurrences 2
Significant Events 4
Probability of Future Events 5
Vulnerability and Impact 5
Assessment of Impacts 7

HAZARD DESCRIPTION

According to the National Oceanic and Atmospheric Administration (NOAA), a hurricane is an intense tropical weather system of strong thunderstorms with well-defined surface circulation and maximum sustained winds of 74 mph or higher. In the Northern Hemisphere circulation of winds near the Earth's surface is counterclockwise.



Hurricanes often begin as tropical depressions that intensify into tropical storms when maximum sustained winds increase to between 35 – 64 knots (39 – 73 mph). At these wind speeds, the storm becomes more organized and circular in shape and begins to resemble a hurricane. Tropical storms resulting in high winds and heavy rainfall can be equally problematic without ever becoming a hurricane and can be dangerous to people and property, resulting in high winds and heavy rainfall, as Tropical Storm Hermine did for Travis and Williamson Counties in September 2010. Once sustained winds reach or exceed 74 mph, the storm becomes a hurricane. The intensity of a land falling hurricane is expressed in categories relating wind speeds to potential damage. Tropical storm-force winds are strong enough to be dangerous to those caught in them.

LOCATION

The Bastrop County planning area is located inland from the coast and is outside of the hurricane wind speed hazard areas. Thus, the Bastrop County planning area is in a low-risk area for hurricane wind speeds of 90 miles per hour (mph) or less. However, the Bastrop County planning area, including all participating jurisdictions, ISDs and special districts, is susceptible to the indirect threats of a hurricane, including high winds and flooding. Additionally, the Bastrop County planning area has hosted coastal area residents who evacuate during hurricane events.

SECTION 10: HURRICANE/TROPICAL STORM WIND

EXTENT

As a hurricane develops, the barometric pressure (measured in millibars or inches) at its center falls and winds increase. If the atmospheric and oceanic conditions are favorable, it can intensify into a tropical depression. When maximum sustained winds reach or exceed 39 miles per hour, the system is designated a tropical storm, given a name, and is closely monitored by the National Hurricane Center in Miami, Florida. When sustained winds reach or exceed 74 miles per hour the storm is deemed a hurricane.

Hurricanes are categorized according to the strength and intensity of their winds using the Saffir-Simpson Hurricane Scale (Table 10-1). A Category 1 storm has the lowest wind speeds, while a Category 5 hurricane has the highest. However, a lower category storm can inflict greater damage than higher category storms depending on where they strike, the amount of storm surge, other weather they interact with, and how slow they move.

Table 10-1. Extent Scale for Hurricanes[1]

CATEGORY	MAXIMUM SUSTAINED WIND SPEED (Mph)	MINIMUM SURFACE PRESSURE (Millibars)	STORM SURGE (Feet)
1	74 – 95	Greater than 980	3 – 5
2	96 – 110	979 – 965	6 – 8
3	111 – 130	964 – 945	9 – 12
4	131 – 155	944 – 920	13 – 18
5	155 +	Less than 920	19+

Based on the historical storm tracks for hurricanes and the location of the Bastrop County planning area, which is outside of the hurricane wind hazard area, the highest extent to be mitigated is for a Category 1 storm for the planning area.

HISTORICAL OCCURRENCES

By the time hurricanes and tropical storms have made landfall at various magnitudes (categories) in the Bastrop County planning area, the storms have usually weakened to tropical storms or depressions, being near the end of their life cycle. With the storms having reduced winds, extreme rainfall is the hazard of concern. In Figure 10-1 below, hurricane tracks are reflective of their strength in the Bastrop County planning area. Table 10-2 lists the storms that have tracked through the planning area. Historical hurricane data for Bastrop County, including all participating jurisdictions, ISDs and special districts, is provided on a County-wide basis per the National Centers for Environmental Information (NCEI) and National Oceanic and Atmospheric Administration (NOAA) databases.

[1] Source: National Hurricane Center

Figure 10-1. Location of Historic Storm Tracks

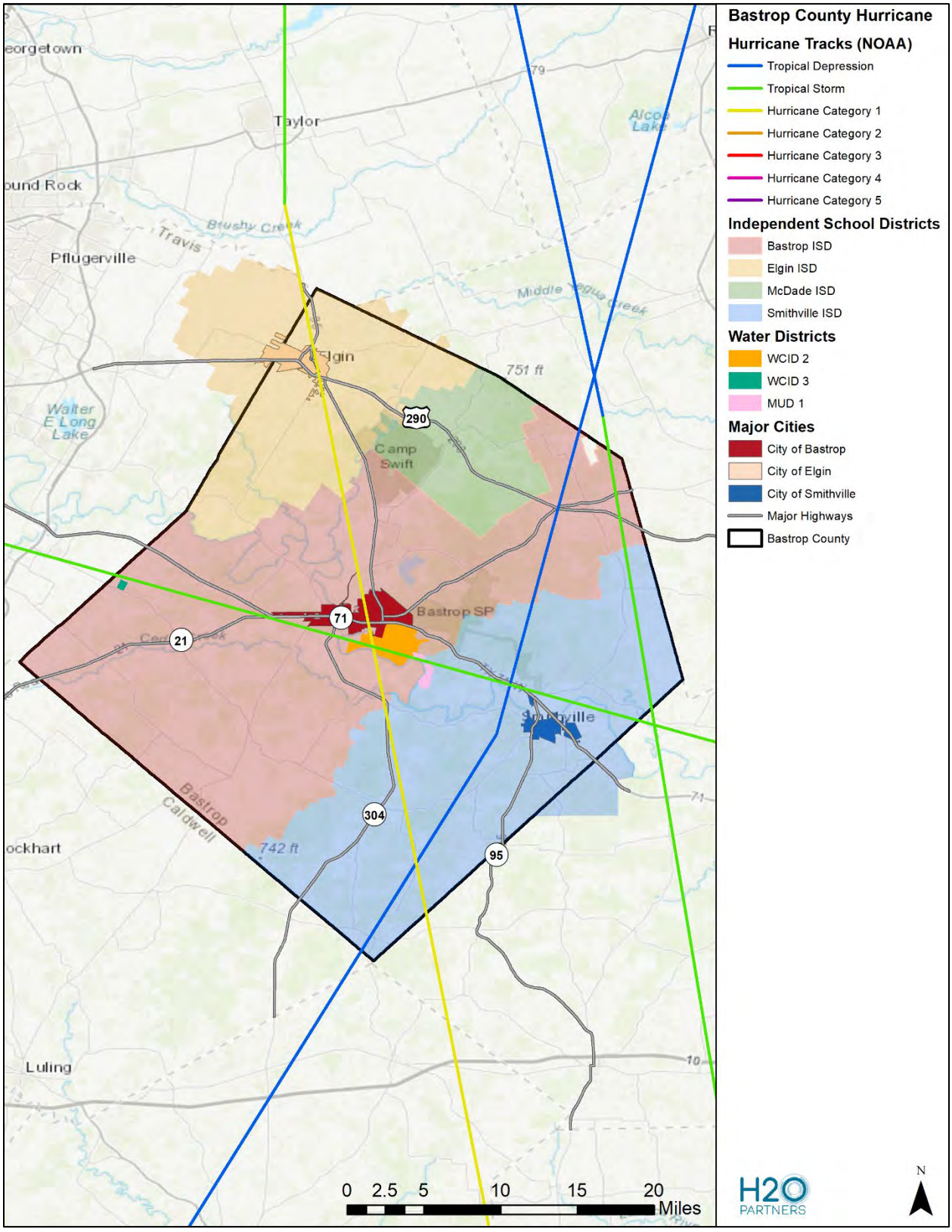


Table 10-2. Historic Storms

YEAR	STORM NAME	CATEGORY
1902	Unnamed	Tropical Storm
1941	Unnamed	Tropical Storm
1961	Carla	Category 1
1973	Delia	Tropical Storm
2015	Bill	Tropical Storm
2017	Harvey	Tropical Storm

Based on the list of historical hurricane and tropical storm events for the Bastrop County planning area (listed above) two of the events have occurred since the 2016 Plan.

SIGNIFICANT EVENTS

Tropical Storm Bill, June 16-17, 2015 – Bastrop County

Tropical Storm Bill made landfall on Matagorda Island, Matagorda County, Texas at 11:45 am. Its maximum sustained wind speed at landfall was 60 mph. Tropical Storm Bill moved inland and was downgraded to a tropical depression at 1:00 am on June 17. After spending three days over land as a tropical depression, Bill finally transitioned into a post-tropical cyclone on the afternoon of June 20 over eastern Kentucky. Although Bill brought coastal flooding and gusty winds to the Texas Coast at landfall, its primary impact was rainfall flooding. Peak rainfall totals from Bill were: 13.28 inches near El Campo, Texas; 12.53 inches near Healdton, Oklahoma; and 11.77 inches near Ganado, Texas. A Flash Flood Watch was issued for Bastrop County, but no serious flooding occurred. Rainfall totals for the Bastrop County area during this event ranged from less than 0.5 to 4 inches.

Hurricane Harvey, August 25-26, 2017 – Bastrop County

Hurricane Harvey moved onshore as a Category 4 hurricane over San Jose Island east of Rockport during the late evening of August 25th. Harvey moved inland during the morning of August 26th as a Category 1 hurricane. It continued to weaken as it moved farther inland eventually reaching south central Texas as a tropical storm during the late evening of August 26th. A number of places in Fayette, Lavaca, and Bastrop Counties received 20 or more inches of rain. Tropical storm force winds with estimated gusts up to 60 mph caused damage across the region. Trees and branches were knocked down by the winds. Some of these in turn knocked down power lines causing power outages. 100 people were evacuated in Bastrop County. Rainfall over the far western side of Bastrop County was about 12 inches, while the Smithville area had a seven-day rain total of nearly 24 inches. The Colorado River at Smithville crested near 32 feet on August 28, flooding about 60 homes in the Smithville area. There were about 150 low water crossings underwater and many roads were damaged. Overall estimates to damage in the county are about 1.5 million dollars, about a million of that coming from damage to roads and bridges.

SECTION 10: HURRICANE/TROPICAL STORM WIND

PROBABILITY OF FUTURE EVENTS

Based on historical occurrences of significant hurricane wind events, the probability of future events is Unlikely, with a frequency of occurrence of one event every ten years or more for the Bastrop County planning area, including all participating jurisdictions, ISDs, and special districts.

VULNERABILITY AND IMPACT

Hurricane-force winds can cause major damage to large areas; hence all existing buildings, facilities and populations are equally exposed and vulnerable to this hazard and could potentially be impacted. Most structures in the planning area can resist the effects of all but the most severe wind storms. The Bastrop County planning area features multiple mobile or manufactured home parks throughout the planning area. These parks are typically more vulnerable to hurricane events than typical site-built structures. In addition, manufactured homes are located sporadically throughout the planning area which would also be more vulnerable. The US Census data indicates a total of 7,672 (25.5%) manufactured homes located in the Bastrop County planning area (Table 10-3). In addition, 25.4% (approximately 7,612 structures) of the single family residential (SFR) structures in the entire planning area were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant hurricane events.

Table 10-3. Bastrop County Structures at Greater Risk

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Bastrop County[2]	7,672	7,612
City of Bastrop	42	950
City of Elgin	213	1,407
City of Smithville	200	1,227
Bastrop ISD	-	-
Elgin ISD	-	-
McDade ISD	-	-
Smithville ISD	-	-
Bastrop County MUD #1	0	3
Bastrop County WCID #2	0	1
Bastrop County WCID #3	0	0

The following critical facilities would be vulnerable to hurricane events in the planning area:

[2] County totals includes all incorporated jurisdictions and unincorporated areas.

Table 10-4. Bastrop County Critical Facilities at Risk

JURISDICTION	CRITICAL FACILITIES
Bastrop County	1 Animal Shelter, 2 Cancer Research Facilities, 7 Communications Facilities, 1 County 911 Dispatch Facility, 8 Government Facilities, 1 Detention Facility, 4 Educational Facilities, 3 Electric Cooperative Facilities, 1 EOC, 1 Emergency Services Facility, 1 Prison Facility, 13 Fire Station Facilities, 1 Gas Storage Facility, 2 Hazardous Material Facilities, 4 Vulnerable Population Residential Facilities, 4 Emergency Medical Facilities, 1 Military Training Facility, 1 Pipeline Transportation Facility, 1 Power Distribution Facility, 2 Power Generation Facilities, 2 Propane Distribution Facilities, 1 Rail Yard Facility, 4 Government Storage Facilities, 1 School Bus Transport Facility, 1 Sheriff's Office, 2 DOT Program Facilities, 1 Wastewater Treatment Plant, 2 Water Facilities
City of Bastrop	2 Bridges, 1 Government Facility, 2 Communications Facility, 1 Corrections Facility, 6 Educational Facilities, 2 Electric Substations, 1 Emergency Shelter, 2 Fire Station Facilities, 2 Emergency Medical Facilities, 2 Police Station Facilities (including 911 Center), 1 Government Storage Facility, 19 Wastewater Lift Stations, 2 Wastewater Treatment Facilities, 12 Water Well Facilities
City of Elgin	1 Emergency Evacuation Center, 1 Helicopter Landing Pad, 1 Emergency Medical Facility, 1 Police Station, 1 Fire Station, 1 Water Treatment Facility
City of Smithville	1 Government Facility, 1 Government Storage Facility, 2 Chemical Storage Facilities, 1 Communications Facility, 1 Emergency Shelter, 2 Fire Stations, 1 Municipal Airport, 1 Police Station, 3 Pump Stations, 2 Wastewater Chemical Facilities, 4 Wastewater Treatment Facilities, 1 Water System Facility, 6 Water Storage Facilities, 3 Water Well Facilities
Bastrop ISD	14 School Campus Locations (All facilities including schools, administration facilities, maintenance and operations facilities, service center, stadium, technology building, and transportation facility)
Elgin ISD	7 School Campus Locations (All facilities including schools, administration facilities, development center, maintenance and operations, nutrition services facility, technology building, and transportation facility)
McDade ISD	4 School Campus Locations (All facilities including schools, administration facilities, AG shop facility, band hall, maintenance and operations, nutrition services facility, technology building, and transportation facility)

JURISDICTION	CRITICAL FACILITIES
Smithville ISD	4 School Campus Locations (All facilities including schools, administration facilities, and maintenance and operations facilities)
Bastrop County MUD #1	11 Services Office, 1 Operations Center, 1 Operations and Maintenance Firm, 1 Wastewater Plant, 1 Water Plant, 1 Water Facility, All Pipeline Infrastructure
Bastrop County WCID #2	1 Water Well and Pumping Station, All Pipeline Infrastructure
Bastrop County WCID #3	None

Storm track data was available for the past 150 years; and property and crop loss data was available from 1950 to the present. Only hurricane wind events that have been reported have been factored into this Risk Assessment. It is likely that additional hurricane wind occurrences have gone unreported before and during the recording period. Table 10-5 shows the annualized losses based on historical incident information for the planning area. The average annual loss estimate for the Bastrop County planning area is considered negligible as most damages related to hurricane and tropical storm events are recorded under the flood profile (Section 5).

Table 10-5. Potential Annualized Losses by Jurisdiction

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Bastrop County	$0	$0

The impact of hurricane wind events experienced in Bastrop County planning area has resulted in no injuries or fatalities. Based on the level of risk and historical occurrences for hurricane winds in the Bastrop County planning area, including all participating jurisdictions, ISDs, and special districts, there is a “Limited” severity of impact; meaning the shutdown of critical facilities and services could be for 24-hours or less, and less than ten percent of property can be destroyed or experience major damage.

ASSESSMENT OF IMPACTS

Hurricane events have the potential to pose a significant risk to people and can create dangerous and difficult situations for public health and safety officials. The impact of climate change could produce larger, more severe hurricane events, exacerbating the current hurricane impacts. Worsening hurricane conditions can be frequently associated with a variety of impacts, including:

- Individuals exposed to the storm can be struck by flying debris, falling limbs, or downed trees causing serious injury or death.
- Structures can be damaged or crushed by falling trees, which can result in physical harm to the occupants.
- Driving conditions in all jurisdictions may be dangerous during a hurricane event, especially over the Causeway or other elevated bridges, elevating the risk of injury and accidents during evacuations if not timed properly.
- Additional resources may be required for emergency preparedness and response during the summer months due to increases in populations along the coast.

- Emergency evacuations may be necessary prior to a hurricane landfall, requiring emergency responders, evacuation routing and temporary shelters in the planning area.
- Significant debris and downed trees can result in emergency response vehicles being unable to access areas of the community.
- Downed power lines may result in roadways being unsafe for use, which may prevent first responders from answering calls for assistance or rescue.
- During hurricane landfall, first responders may be prevented from responding to calls, as the winds may reach a speed in which their vehicles and equipment are unsafe to operate.
- Hurricane events often result in widespread power outages increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.
- Extended power outage often results in an increase in structure fires and carbon monoxide poisoning, as individuals attempt to cook or heat their homes with alternate, unsafe cooking or heating devices, such as grills.
- Extreme hurricane events may rupture gas lines and down trees and power lines, increasing the risk of structure fires during and after a storm event.
- Extreme hurricane events may lead to prolonged evacuations during search and rescue, and immediate recovery efforts requiring additional emergency personnel and resources to prevent entry, and protect citizens and property.
- First responders are exposed to downed power lines, unstable and unusual debris, hazardous materials, and generally unsafe conditions.
- Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications.
- Critical staff may be unable to report for duty, limiting response capabilities.
- City or county departments may be damaged, delaying response and recovery efforts for the entire community.
- Private sector entities that the city and its residents rely on, such as utility providers, financial institutions, and medical care providers may not be fully operational and may require assistance from neighboring communities until full services can be restored.
- Economic disruption negatively impacts the programs and services provided by the community due to short- and long-term loss in revenue.
- Some businesses not directly damaged by the hurricane may be negatively impacted while roads are cleared and utilities are being restored, further slowing economic recovery.
- Older structures built to less stringent building codes may suffer greater damage as they are typically more vulnerable to hurricane damage.
- Large scale hurricanes can have significant economic impact on the affected area, as it must now fund expenses such as infrastructure repair and restoration, temporary services and facilities, overtime pay for responders, as well as normal day-to-day operating expenses.
- Businesses that are more reliant on utility infrastructure than others may suffer greater damages without a backup power source.

SECTION 10: HURRICANE/TROPICAL STORM WIND

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

SECTION 11: LIGHTNING

Hazard Description 1
Location 1
Extent 1
Historical Occurrences 3
Probability of Future Events 3
Vulnerability and Impact 4
Assessment of Impacts 5

HAZARD DESCRIPTION

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

According to FEMA, an average of 300 people are injured and 80 people are killed in the United States each year by lightning. Direct lightning strikes also have the ability to cause significant damage to buildings, critical facilities, and infrastructure. Lightning is also responsible for igniting wildfires that can result in widespread damages to property before firefighters have the ability to contain and suppress the resultant fire.

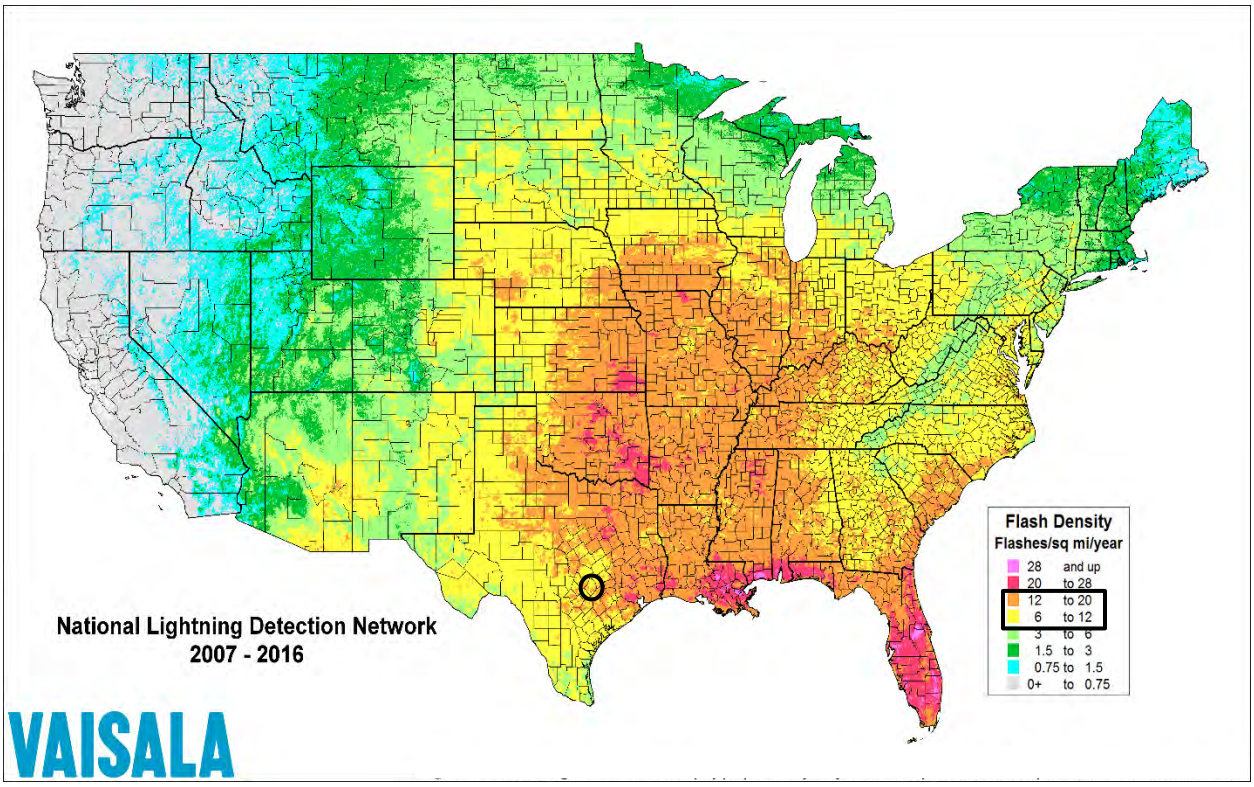
LOCATION

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

EXTENT

According to the NOAA, the average number of cloud-to-ground flashes for the State of Texas between 2007 and 2016 was 11.3 flashes per square mile. Vaisala's U.S. National Lightning Detection Network lightning flash density map (Figure 11-1) shows a range of six to twenty cloud-to-ground lightning flashes per square mile per year for the entire Bastrop County planning area. This rate equates to approximately 5,376 to 17,920 flashes per year for the entire planning area.

Figure 11-1. Lightning Flash Density, 2007-2016



The extent for lightning can be expressed in terms of the number of strikes in an interval. NOAA utilizes lightning activity levels (LALs) on a scale from 1-6. LAL rankings reflect the frequency of cloud-to-ground lightning either forecast or observed (Table 11-1).

Table 11-1. NOAA Lightning Activity Levels (LAL)

LAL	CLOUD & STORM DEVELOPMENT	LIGHTNING STRIKES/ 15 MIN
1	No thunderstorms.	-
2	Cumulus clouds are common but only a few reach the towering cumulus stage. A single thunderstorm must be confirmed in the observation area. The clouds produce mainly virga, but light rain will occasionally reach the ground. Lightning is very infrequent.	1-8
3	Towering cumulus covers less than two-tenths of the sky. Thunderstorms are few, but two to three must occur within the observation area. Light to moderate rain will reach the ground, and lightning is infrequent.	9-15
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

LAL	CLOUD & STORM DEVELOPMENT	LIGHTNING STRIKES/ 15 MIN
5	Towering cumulus and thunderstorms are numerous. They cover more than three-tenths and occasionally obscure the sky. Rain is moderate to heavy and lightning is frequent and intense.	>25
6	Similar to LAL 3 except thunderstorms are dry.	

The NCEI does not include the LAL for historical lightning events, therefore in order to determine the extent of lightning strikes, the yearly average range of estimated number of lightning strikes within the planning area (5,376 to 17,920 flashes) and a cloud-to-ground flash density of six to twenty flashes per square mile were divided by the number[1] of thunderstorm events that occur annually in the planning area. Bastrop County, including all participating jurisdictions, ISDs, and special districts, should expect an average range of six to eighteen lightning strikes within 15 minutes at any given time during a lightning or combined lightning and thunderstorm event, indicating lightning strikes have an average LAL range of 2 to 4, which can be anticipated for all participating jurisdictions.

HISTORICAL OCCURRENCES

Since January 1996, there has been no recorded lightning events reported as having impacted the Bastrop County Planning Area, based upon NCEI records. Elgin ISD reported a lightning event that disrupted the phone system in 1991. No other participating jurisdiction, ISD or special district reported any specific lightning events. However, all special district team members report lightning as a significant and frequently occurring event, impacting infrastructure and operations.

It is highly likely multiple lightning occurrences have gone unreported before and during the recording period. The NCEI is a national data source organized under the National Oceanic and Atmospheric Administration and considered a reliable resource for hazards. However, the flash density for the planning area along with input from local team members indicates regular lightning occurrences that simply have not been reported.

PROBABILITY OF FUTURE EVENTS

Based on the annual lightning flash density and input from the planning team the probability of occurrence for future lightning events in the Bastrop County planning area, including all participating jurisdictions, ISDs, and special districts, is considered highly likely, or an event probable in the next year. The planning team stated that lightning occurs regularly in the area. According to NOAA, the Bastrop County planning area is located in an area of the country that experiences six to twenty lightning flashes per square mile per year (approximately 5,376 to 17,920 flashes per year). Given this estimated probability of events, it can be expected that future lightning events will continue to threaten life and cause minor property damages throughout the planning area, including all participating jurisdictions, ISDs, and special districts.

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

VULNERABILITY AND IMPACT

Vulnerability is difficult to evaluate since lightning events can occur at different strength levels, in random locations, and can create a broad range of damages depending on the strike location. Due to the randomness of these events, all existing and future structures and facilities in the entire Bastrop County planning area could potentially be impacted and remain vulnerable to possible injury and property loss from lightning strikes. The Bastrop County planning area has no reported lightning events however the county, including all participating jurisdictions, ISDs, and special districts, are vulnerable and could be impacted by lightning.

The direct and indirect losses associated with these events include injury and loss of life, damage to structures and infrastructure, agricultural losses, utility failure (power outages), and stress on community resources. The entire population of the Bastrop County planning area, is considered exposed to the lightning hazard. The peak lightning season in the State of Texas is from June to August; however, the most fatalities occur in July. Fatalities occur most often when people are outdoors and/or participating in some form of recreation. Population located outdoors is considered at risk and more vulnerable to a lightning strike compared to being inside a structure. Students and faculty participating in outdoor functions at both ISDs would be more vulnerable.

The entire general building stock and all infrastructure of the Bastrop County planning area, are considered exposed to the lightning hazard. Lightning can be responsible for damages to buildings, cause electrical, forest and/or wildfires, and damage infrastructure such as power transmission lines and communication towers. Agricultural losses can be extensive due to lightning and resulting fires.

The following critical facilities would be vulnerable to lightning events in each participating jurisdiction:

Table 11-2. Critical Facilities at Risk by Jurisdiction

JURISDICTION	CRITICAL FACILITIES
Bastrop County	1 Animal Shelter, 2 Cancer Research Facilities, 7 Communications Facilities, 1 County 911 Dispatch Facility, 8 Government Facilities, 1 Detention Facility, 4 Educational Facilities, 3 Electric Cooperative Facilities, 1 EOC, 1 Emergency Services Facility, 1 Prison Facility, 13 Fire Station Facilities, 1 Gas Storage Facility, 2 Hazardous Material Facilities, 4 Vulnerable Population Residential Facilities, 4 Emergency Medical Facilities, 1 Military Training Facility, 1 Pipeline Transportation Facility, 1 Power Distribution Facility, 2 Power Generation Facilities, 2 Propane Distribution Facilities, 1 Rail Yard Facility, 4 Government Storage Facilities, 1 School Bus Transport Facility, 1 Sheriff's Office, 2 DOT Program Facilities, 1 Wastewater Treatment Plant, 2 Water Facilities
City of Bastrop	2 Bridges, 1 Government Facility, 2 Communications Facility, 1 Corrections Facility, 6 Educational Facilities, 2 Electric Substations, 1 Emergency Shelter, 2 Fire Station Facilities, 2 Emergency Medical Facilities, 2 Police Station Facilities (including 911 Center), 1 Government Storage Facility, 19

JURISDICTION	CRITICAL FACILITIES
	Wastewater Lift Stations, 2 Wastewater Treatment Facilities, 12 Water Well Facilities
City of Elgin	1 Emergency Evacuation Center, 1 Helicopter Landing Pad, 1 Emergency Medical Facility, 1 Police Station, 1 Fire Station, 1 Water Treatment Facility
City of Smithville	1 Government Facility, 1 Government Storage Facility, 2 Chemical Storage Facilities, 1 Communications Facility, 1 Emergency Shelter, 2 Fire Stations, 1 Municipal Airport, 1 Police Station, 3 Pump Stations, 2 Wastewater Chemical Facilities, 4 Wastewater Treatment Facilities, 1 Water System Facility, 6 Water Storage Facilities, 3 Water Well Facilities
Bastrop ISD	14 School Campus Locations (All facilities including schools, administration facilities, maintenance and operations facilities, service center, stadium, technology building, and transportation facility)
Elgin ISD	7 School Campus Locations (All facilities including schools, administration facilities, development center, maintenance and operations, nutrition services facility, technology building, and transportation facility)
McDade ISD	4 School Campus Locations (All facilities including schools, administration facilities, AG shop facility, band hall, maintenance and operations, nutrition services facility, technology building, and transportation facility)
Smithville ISD	4 School Campus Locations (All facilities including schools, administration facilities, and maintenance and operations facilities)
Bastrop County MUD #1	11 Services Office, 1 Operations Center, 1 Operations and Maintenance Firm, 1 Wastewater Plant, 1 Water Plant, 1 Water Facility, All Pipeline Infrastructure
Bastrop County WCID#2	1 Water Well and Pumping Station, All Pipeline Infrastructure
Bastrop County WCID#3	None

Impact of lightning experienced in the Bastrop County planning area has resulted in no injuries or fatalities. Impact of lightning events experienced in the Bastrop County planning area including all participating jurisdictions, ISDs, and special districts, would be “Limited,” and injuries and illnesses would be treatable with first aid. The quality of life lost would be minor, and facilities would be shut down for 24 hours or less. Overall, the average loss estimate for the entire Bastrop County planning area is negligible.

ASSESSMENT OF IMPACTS

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

- Individuals exposed to the storm can be directly struck, posing significant health risks and potential death.
- Structures can be damaged or crushed by falling trees damaged by lightning, which can result in physical harm to the occupants.
- Lightning strikes can result in widespread power outages increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.
- Extended power outage often results in an increase in structure fires and carbon monoxide poisoning as individuals attempt to cook or heat their homes with alternate, unsafe cooking or heating devices, such as grills.
- Lightning strikes can be associated with structure fires and wildfires, creating additional risk to residents and first responders.
- Emergency operations and services may be significantly impacted due to power outages and/or loss of communications.
- City or county departments may be damaged, delaying response and recovery efforts for the entire community.
- Economic disruption due to power outages and fires negatively impacts the programs and services provided by the community due to short- and long-term loss in revenue.
- Some businesses not directly damaged by lightning events may be negatively impacted while utilities are being restored, further slowing economic recovery.
- Businesses that are more reliant on utility infrastructure than others may suffer greater damages without a backup power source.

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

SECTION 12: HAIL

Hazard Description 1
Location 1
Extent 1
Historical Occurrences 2
Significant Events 6
Probability of Future Events 6
Vulnerability and Impact 6
Assessment of Impacts 9

HAZARD DESCRIPTION



Hailstorm events are a potentially damaging outgrowth of severe thunderstorms. During the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to the rapid rising of warm air into the upper atmosphere, and the subsequent cooling of the air mass. Frozen droplets gradually accumulate into ice crystals until they fall as precipitation that is round or irregularly shaped masses of ice typically greater than 0.75 inches in diameter. The size of hailstones is a direct result of the size and severity of the storm. High velocity updraft winds are required to keep hail in suspension in thunderclouds. The strength of the updraft is a by-product of heating on the Earth's surface. Higher temperature gradients above Earth's surface result in increased suspension time and hailstone size.

LOCATION

Hailstorms are an extension of severe thunderstorms that could potentially cause severe damage. As a result, they are not confined to any specific geographic location and can vary greatly in size, location, intensity, and duration. Therefore, the Bastrop County planning area, including all participating jurisdictions, ISDs, and special districts, are equally at risk to the hazard of hail.

EXTENT

The National Weather Service (NWS) classifies a storm as "severe" if there is hail three-quarters of an inch in diameter (approximately the size of a penny) or greater, based on radar intensity or as seen by observers. The intensity category of a hailstorm depends on hail size and the potential damage it could cause, as depicted in the National Centers for Environmental Information (NCEI) Intensity Scale in Table 12-1.

Table 12-1. Hail Intensity and Magnitude[1]

SIZE CODE	INTENSITY CATEGORY	SIZE (Diameter Inches)	DESCRIPTIVE TERM	TYPICAL DAMAGE
H0	Hard Hail	Up to 0.33	Pea	No damage
H1	Potentially Damaging	0.33 – 0.60	Marble	Slight damage to plants and crops
H2	Potentially Damaging	0.60 – 0.80	Dime	Significant damage to plants and crops
H3	Severe	0.80 – 1.20	Nickel	Severe damage to plants and crops
H4	Severe	1.2 – 1.6	Quarter	Widespread glass and auto damage
H5	Destructive	1.6 – 2.0	Half Dollar	Widespread destruction of glass, roofs, and risk of injuries
H6	Destructive	2.0 – 2.4	Ping Pong Ball	Aircraft bodywork dented and brick walls pitted
H7	Very Destructive	2.4 – 3.0	Golf Ball	Severe roof damage and risk of serious injuries
H8	Very Destructive	3.0 – 3.5	Hen Egg	Severe damage to all structures
H9	Super Hailstorms	3.5 – 4.0	Tennis Ball	Extensive structural damage, could cause fatal injuries
H10	Super Hailstorms	4.0 +	Baseball	Extensive structural damage, could cause fatal injuries

The intensity scale in Table 12-1 ranges from H0 to H10, with increments of intensity or damage potential in relation to hail size (distribution and maximum), texture, fall speed, speed of storm translation, and strength of the accompanying wind. Based on available data regarding the previous occurrences for the area, the Bastrop County planning area, including all participating jurisdictions, ISDs, and special districts, may experience hailstorms ranging from an H0 to an H10. The County can mitigate a storm from low risk or hard hail to a super hailstorm with baseball ball size hail that leads to extensive structural damage and could cause fatal injuries.

HISTORICAL OCCURRENCES

Historical evidence shown in Figure 12-1 demonstrates that the planning area is vulnerable to hail events overall, which typically result from severe thunderstorm activity. Historical events with

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

reported damages, injuries, or fatalities are shown in Table 12-2. A total of 126 reported historical hail events impacted the Bastrop County planning area between January 1968 and September 2021 (Summary Table 12-3). These events were reported to NCEI and NOAA databases and may not represent all hail events to have occurred during the past 54 years. Only those events for the Bastrop County planning area with latitude and longitude available were plotted (Figure 12-1).

Historical hail data for the participating ISDs are provided within the city they are located on a City-wide basis per the NCEI database. Historical events for the MUD #1, WCID #2 and WCID #3 are provided within the reported county events per the NCEI database. Events for the ISDs and special districts are not reported separate and apart from city and county events.

The Elgin ISD reported three historical hail events with significant damages (Table 12-3 below). There have been no reported losses as a result of hail for any of the remaining ISDs or participating special districts.

Figure 12-1. Spatial Historical Hail Events, 1968-2021[2]

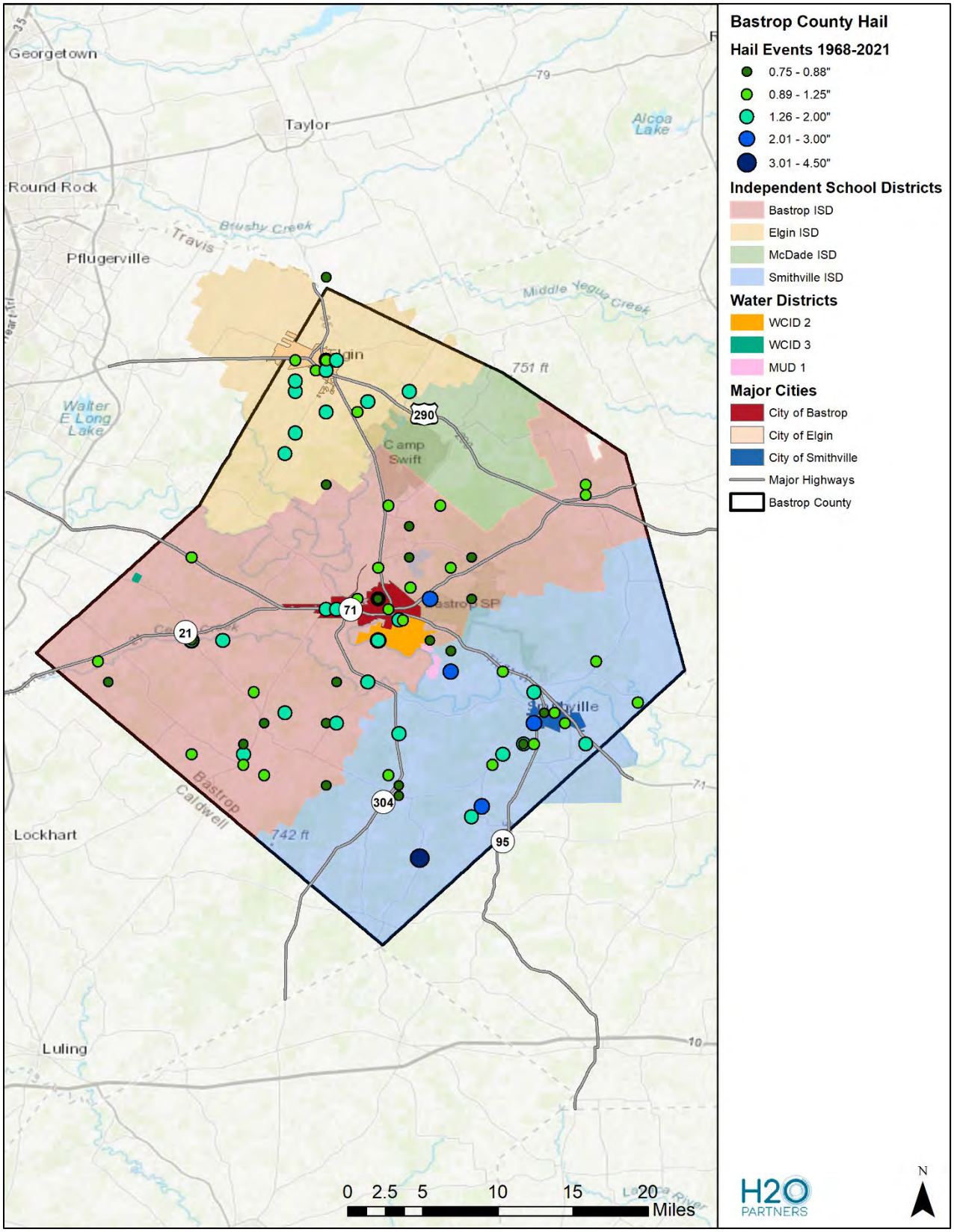


Table 12-2. Historical Hail Events, 1968-2021[3]

JURISDICTION	DATE	MAGNITUDE	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
Bastrop County	3/25/1993	4.5	0	0	$9,158	$0
City of Smithville	5/25/2011	1	0	0	$2,328	$0
Elgin ISD	2016	Unknown	0	0	$2,528,494	$0
Bastrop County	5/23/2017	1.25	0	0	$5,373	$0
Elgin ISD	2020	Unknown	0	0	$830,000	$0
Elgin ISD	2021	Unknown	0	0	$600,000	$0
TOTALS		**(Max Extent)**	**0**	**0**	**$3,975,353**	**$0**

Table 12-3. Historical Hail Events Summary, 1968-2021

JURISDICTION	NUMBER of EVENTS	MAGNITUDE	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
Bastrop County	68	4.5 inches	0	0	$14,531	$0
City of Bastrop	25	1.75 inches	0	0	$0	$0
City of Elgin	16	1.75 inches	0	0	$0	$0
City of Smithville	14	5.5 inches	0	0	$2,328	$0
Bastrop ISD	0	N/A	0	0	$0	$0
Elgin ISD	3	Unknown	0	0	$3,958,494	$0
McDade ISD	0	N/A	0	0	$0	$0
Smithville ISD	0	N/A	0	0	$0	$0
Bastrop County MUD #1	0	N/A	0	0	$0	$0
Bastrop County WCID #2	0	N/A	0	0	$0	$0
Bastrop County WCID #3	0	N/A	0	0	$0	$0
TOTAL LOSSES	**126**	**(Max Extent)**	**0**	**0**	**$3,975,353**	

[2] Historical events reported from January 1968 through September 2021. Elgin ISD provided data for three events with estimated damages and the year of the event. Additional details were not available.
[3] Only recorded events with fatalities, injuries, and/or damages are listed.

Based on the list of historical hail events for the Bastrop County planning area (listed above) 54 of the events have occurred since the 2016 Plan.

SIGNIFICANT EVENTS

May 25, 2011 – City of Smithville/Bastrop County
A thunderstorm produced quarter size hail and strong wind gusts that knocked down some trees and a privacy fence near Lake Thunderbird.

May 23, 2017 – Bastrop County
A thunderstorm produced half dollar size hail that accumulated on the ground in Paige. A house was damaged by the wind driven hail.

PROBABILITY OF FUTURE EVENTS

Based on available records of historic events, 126 events in a 54-year reporting period for Bastrop County provides a probability of two to three events per year. This frequency supports a highly likely probability of future events for the Bastrop County planning area including all participating jurisdictions, ISDs, and special districts.

VULNERABILITY AND IMPACT

Damage from hail approaches 1 billion dollars in the U.S. each year. Much of the damage inflicted by hail is to crops. Even relatively small hail can shred plants to ribbons in a matter of minutes. Vehicles, roofs of buildings and homes, and landscaping are most commonly damaged by hail.

Utility systems on roofs at school districts and critical facilities would be vulnerable and could be damaged. Hail could cause a significant threat to people as they could be struck by hail and falling trees and branches. Outdoor student activities and events may elevate the risk to students and faculty when a hailstorm strikes with little warning. Hail events during school hours could elevate the risk to students and faculty due to broken windows and flying debris. Portable buildings utilized by campuses within school districts would be more vulnerable to hail events than the typical site built structures. In addition, outdoor equipment at all ISD campuses would be more vulnerable including air conditioning units, and athletic fields equipped with operational infrastructure. Windows at all structures would be vulnerable and shattered glass may cause injury to students and faculty.

The Bastrop County planning area features mobile or manufactured home parks throughout the planning area, including all participating jurisdictions. These parks are typically more vulnerable to hail events than typical site-built structures. In addition, manufactured homes are located sporadically throughout the planning area including all participations which would also be more vulnerable. The US Census data indicates a total of 7,672 (25.5%) manufactured homes located in the Bastrop County, Table 12-4). In addition, 25.4% (approximately 7,612 structures) of the single family residential (SFR) structures in the Bastrop County planning area were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant hail events.

Table 12-4. Structures at Greater Risk by Jurisdiction

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Bastrop County[4]	7,672	7,612
City of Bastrop	42	950
City of Elgin	213	1,407
City of Smithville	200	1,227
Bastrop ISD	-	-
Elgin ISD	-	-
McDade ISD	-	-
Smithville ISD	-	-
Bastrop County MUD #1	0	3
Bastrop County WCID #2	0	1
Bastrop County WCID #3	0	0

The following critical facilities would be vulnerable to hail events in each participating jurisdiction:

Table 12-5. Critical Facilities at Risk by Jurisdiction

JURISDICTION	CRITICAL FACILITIES
Bastrop County	1 Animal Shelter, 2 Cancer Research Facilities, 7 Communications Facilities, 1 County 911 Dispatch Facility, 8 Government Facilities, 1 Detention Facility, 4 Educational Facilities, 3 Electric Cooperative Facilities, 1 EOC, 1 Emergency Services Facility, 1 Prison Facility, 13 Fire Station Facilities, 1 Gas Storage Facility, 2 Hazardous Material Facilities, 4 Vulnerable Population Residential Facilities, 4 Emergency Medical Facilities, 1 Military Training Facility, 1 Pipeline Transportation Facility, 1 Power Distribution Facility, 2 Power Generation Facilities, 2 Propane Distribution Facilities, 1 Rail Yard Facility, 4 Government Storage Facilities, 1 School Bus Transport Facility, 1 Sheriff's Office, 2 DOT Program Facilities, 1 Wastewater Treatment Plant, 2 Water Facilities
City of Bastrop	2 Bridges, 1 Government Facility, 2 Communications Facility, 1 Corrections Facility, 6 Educational Facilities, 2 Electric Substations, 1 Emergency Shelter, 2 Fire Station Facilities, 2 Emergency Medical Facilities, 2 Police Station Facilities

[4] County totals includes all incorporated jurisdictions and unincorporated areas.

JURISDICTION	CRITICAL FACILITIES
	(including 911 Center), 1 Government Storage Facility, 19 Wastewater Lift Stations, 2 Wastewater Treatment Facilities, 12 Water Well Facilities
City of Elgin	1 Emergency Evacuation Center, 1 Helicopter Landing Pad, 1 Emergency Medical Facility, 1 Police Station, 1 Fire Station, 1 Water Treatment Facility
City of Smithville	1 Government Facility, 1 Government Storage Facility, 2 Chemical Storage Facilities, 1 Communications Facility, 1 Emergency Shelter, 2 Fire Stations, 1 Municipal Airport, 1 Police Station, 3 Pump Stations, 2 Wastewater Chemical Facilities, 4 Wastewater Treatment Facilities, 1 Water System Facility, 6 Water Storage Facilities, 3 Water Well Facilities
Bastrop ISD	14 School Campus Locations (All facilities including schools, administration facilities, maintenance and operations facilities, service center, stadium, technology building, and transportation facility)
Elgin ISD	7 School Campus Locations (All facilities including schools, administration facilities, development center, maintenance and operations, nutrition services facility, technology building, and transportation facility)
McDade ISD	4 School Campus Locations (All facilities including schools, administration facilities, AG shop facility, band hall, maintenance and operations, nutrition services facility, technology building, and transportation facility)
Smithville ISD	4 School Campus Locations (All facilities including schools, administration facilities, and maintenance and operations facilities)
Bastrop County MUD #1	11 Services Office, 1 Operations Center, 1 Operations and Maintenance Firm, 1 Wastewater Plant, 1 Water Plant, 1 Water Facility, All Pipeline Infrastructure
Bastrop County WCID#2	1 Water Well and Pumping Station, All Pipeline Infrastructure
Bastrop County WCID#3	None

Hail has been known to cause injury to humans and occasionally has been fatal. Overall, the average loss estimate of property and crops (in 2021 dollars) is $3,975,353, having an approximate annual loss estimate of $73,618. Based on historic loss and damages, the impact of hail damages on the Bastrop County planning area, including all participating jurisdictions, ISDs, and special districts, can be considered “Limited” severity of impact meaning injuries and illness can be treated with first aid, county area facilities are shut down for 24 hours or less, and less than ten percent of property destroyed or with major damage.

Table 12-6. Potential Annualized Losses by Jurisdiction

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATE
Bastrop County	$14,531	$269
City of Bastrop	$0	$0
City of Elgin	$0	$0
City of Smithville	$2,328	$43
Bastrop ISD	$0	$0
Elgin ISD	$3,958,494	$73,305
McDade ISD	$0	$0
Smithville ISD	$0	$0
Bastrop County MUD #1	$0	$0
Bastrop County WCID #2	$0	$0
Bastrop County WCID #3	$0	$0
Planning Area	**$3,975,353**	**$73,618**

ASSESSMENT OF IMPACTS

Hail events have the potential to pose a significant risk to people and can create dangerous situations. Impacts to the planning area can include:

- Hail may create hazardous road conditions during and immediately following an event, delaying first responders from providing for or preserving public health and safety.
- Individuals and first responders who are exposed to the storm may be struck by hail, falling branches, or downed trees resulting in injuries or possible fatalities.
- Residential structures can be damaged by falling trees, which can result in physical harm to occupants.
- Large hail events will likely cause extensive roof damage to residential structures along with siding damage and broken windows, creating a spike in insurance claims and a rise in premiums.
- Automobile damage may be extensive depending on the size of the hail and length of the storm.
- Hail events can result in power outages over widespread areas increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.
- Extended power outage can result in an increase in structure fires and/or carbon monoxide poisoning, as individuals attempt to cook or heat their home with alternate, unsafe cooking or heating devices, such as grills.

- First responders are exposed to downed power lines, damaged structures, hazardous spills, and debris that often accompany hail events, elevating the risk of injury to first responders and potentially diminishing emergency response capabilities.
- Downed power lines and large debris, such as downed trees, can result in the inability of emergency response vehicles to access areas of the community.
- Hazardous road conditions may prevent critical staff from reporting for duty, limiting response capabilities.
- Economic disruption negatively impacts the programs and services provided by the community due to short- and long-term loss in revenue.
- Some businesses not directly damaged by the hail event may be negatively impacted while roads are cleared and utilities are being restored, further slowing economic recovery.
- Businesses that are more reliant on utility infrastructure than others may suffer greater damages without a backup power source.
- Hazardous road conditions will likely lead to increases in automobile accidents, further straining emergency response capabilities.
- Depending on the severity and scale of damage caused by large hail events, damage to power transmission and distribution infrastructure can require days or weeks to repair.
- A significant hail event could significantly damage agricultural crops, resulting in extensive economic losses for the community and surrounding area.
- Hail events may injure or kill livestock and wildlife.
- A large hail event could impact the accessibility of recreational areas and parks due to extended power outages or debris clogged access roads.

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

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HAZARD DESCRIPTION

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

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



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

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

LOCATION

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

SECTION 13: THUNDERSTORM WIND

EXTENT

The extent or magnitude of a thunderstorm wind event is measured by the Beaufort Wind Scale. Table 13-1 describes the different intensities of wind in terms of speed and effects, from calm to violent and destructive.

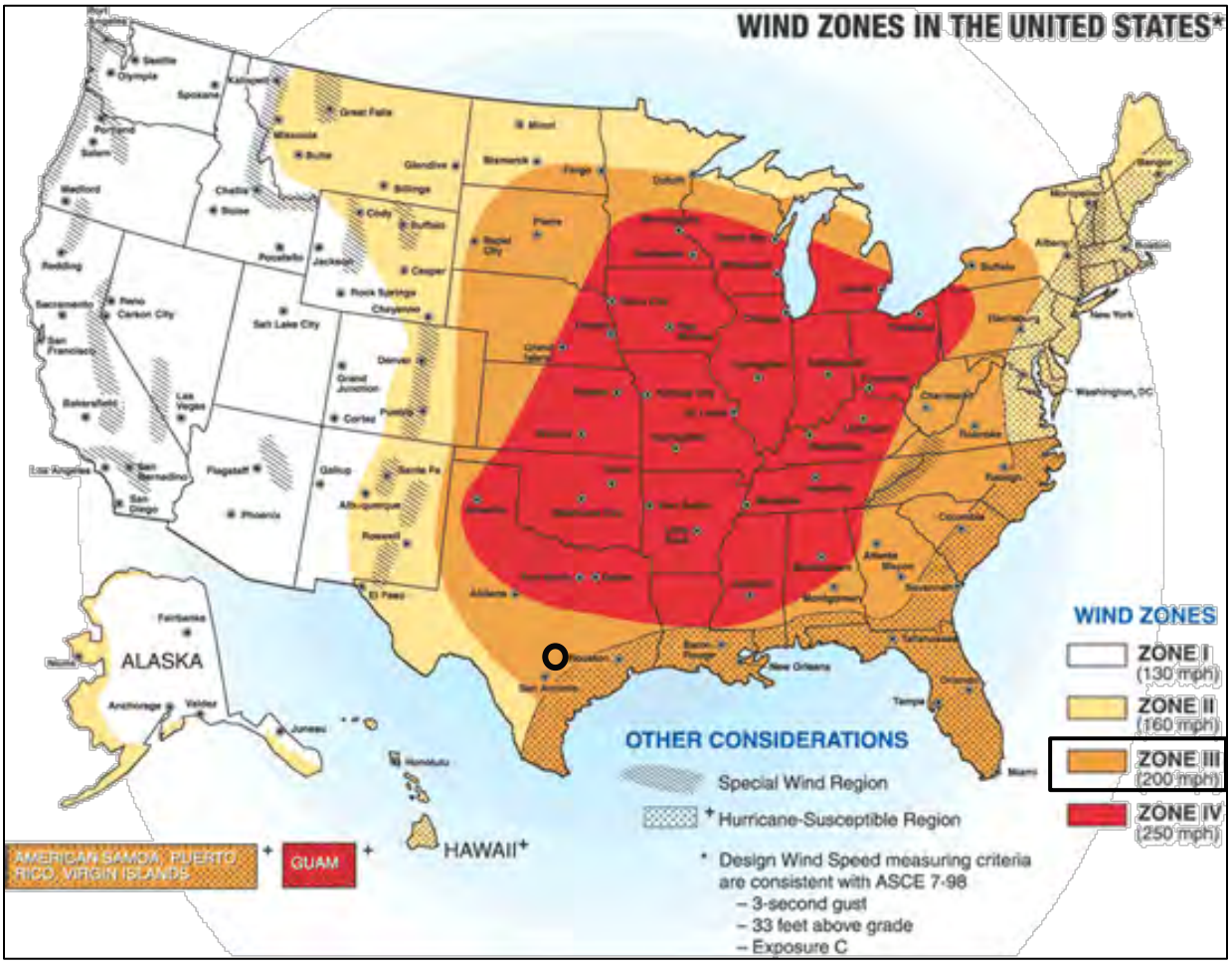
Table 13-1. Beaufort Wind Scale[1]

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

Figure 13-1 displays the wind zones as derived from NOAA.

[1] Source: World Meteorological Organization

Figure 13-1. Wind Zones in the United States[2]



On average, the planning area experiences one to two thunderstorm wind events every year. The planning area is located in Zone III, meaning they can experience winds up to 200 mph. Bastrop County has experienced a significant wind event or an event with winds in the range of "Force 12" on the Beaufort Wind Scale with winds at or above 84 mph. This is the most significant event that can be expected in the future for all participating jurisdictions.

HISTORICAL OCCURRENCES

Tables 13-2, 13-3, and 13-4 depict historical occurrences of thunderstorm wind events for the Bastrop County planning area according to the National Centers for Environmental Information (NCEI) data. Since January 1973, 95 thunderstorm wind events are known to have impacted the Bastrop County planning area, based upon NCEI records. Table 13-3 presents information on known historical events impacting the Bastrop County planning area with resulting damages, injuries or fatalities. It is important to note that high wind events associated with other hazards, such as tornadoes, are not accounted for in this section.

[2] Bastrop County is indicated by the circle.

SECTION 13: THUNDERSTORM WIND

The NCEI is a national data source organized under the National Oceanic and Atmospheric Administration. The NCEI is the largest archive available for climate data; however, it is important to note that the only incidents recorded are those that are reported to the NCEI from January 1973 through September 2021 have been factored into this risk assessment. In the tables that follow throughout this section, some occurrences seem to appear multiple times in one table. This is due to reports from various locations throughout the County. In addition, property damage estimates are not always available. Where an estimate has been provided in a table for losses, the dollar amounts have been altered to indicate the damage in 2021 dollars. Historical thunderstorm wind data for all participating jurisdictions are provided on a City-wide basis per the NCEI database.

Thunderstorm wind events for Bastrop ISD and Smithville ISD are included under the City of Bastrop and the City of Smithville, respectively, as they do not have events reported separate and apart from the reported city events. McDade ISD is reported under county events. Events for all participating special districts are provided within the Bastrop County events per the NCEI database as they do not have events reported separate and apart from the reported county events. Elgin ISD has reported five thunderstorm events with damages that were not reported to the NCEI. These events have been included in the table below (Table 13-3).

Table 13-2. Historical Thunderstorm Wind Events with Reported Damages, 1973-2021[3]

MAXIMUM WIND SPEED RECORDED (MPH)	NUMBER OF REPORTED EVENTS
0-30	23
31-40	0
41-50	14
51-60	28
61-70	16
71-80	0
81-90	0
91-100	1
Unknown	13

Table 13-3. Historical Thunderstorm Wind Events, 1973-2021[4]

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
City of Bastrop	11/6/1994	12:20 AM	0	0	0	$0	$5,271

[3] Historical events are reported from January 1973 through September 2021.

[4] Only recorded events with fatalities, injuries or damages are listed. Magnitude is listed when available. Damage values are in 2021 dollars.

SECTION 13: THUNDERSTORM WIND

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Bastrop County	6/11/1995	1:50 AM	0	0	0	$34,494	$17,247
City of Smithville	8/21/1995	3:30 PM	0	0	0	$25,803	$0
City of Elgin*[5]	5/1989	Unknown	Unknown	0	0	$3,070	$0
City of Elgin*	5/1992	Unknown	Unknown	0	0	$2,530	$0
Bastrop County	8/29/1995	5:00 PM	0	0	0	$17,202	$0
City of Bastrop	9/20/1996	12:20 AM	Unknown	0	0	$16,668	$0
City of Bastrop	4/4/1997	7:00 PM	Unknown	0	0	$82,089	$0
City of Elgin	4/4/1997	7:30 PM	Unknown	0	0	$164,179	$32,836
City of Bastrop	9/3/1997	6:30 PM	Unknown	0	0	$146,844	$0
City of Bastrop	9/9/1997	3:40 PM	Unknown	0	0	$32,632	$0
Bastrop County	7/14/1998	3:35 PM	Unknown	0	0	$32,232	$0
City of Bastrop	5/26/1999	5:30 PM	Unknown	0	0	$23,738	$0
City of Smithville	5/28/1999	3:28 PM	56	0	0	$31,650	$0
City of Elgin	9/2/2000	5:50 PM	Unknown	0	0	$30,284	$0
Bastrop County	10/22/2000	5:00 PM	Unknown	0	0	$30,231	$0
Bastrop County	11/5/2000	9:20 PM	Unknown	0	0	$15,107	$0
Bastrop County	3/19/2002	9:00 PM	Unknown	0	0	$147,100	$147,100
Bastrop County	6/16/2002	3:15 AM	Unknown	0	0	$73,100	$0
City of Elgin	6/16/2002	3:00 AM	Unknown	0	0	$146,200	$0
City of Bastrop	6/13/2003	4:30 PM	55	0	0	$114,541	$0
Bastrop County	8/8/2003	4:15 PM	60	0	0	$142,478	$0
City of Bastrop	8/11/2003	2:00 PM	60	0	0	$28,496	$0
City of Smithville	8/21/2003	11:15 PM	60	0	0	$28,496	$0
Bastrop County	4/25/2007	1:10 AM	70	0	0	$101,802	$0
Bastrop County	8/22/2009	5:15 PM	50	0	0	$30,465	$0

[5] The Elgin ISD provided 5 thunderstorm events with reported damages not included in the NCEI database. Time, date and magnitude was not available.

SECTION 13: THUNDERSTORM WIND

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
City of Bastrop	8/22/2009	5:15 PM	45	0	0	$2,437	$0
City of Elgin	8/22/2009	4:16 PM	50	0	0	$3,656	$0
Bastrop County	8/27/2009	11:50 PM	50	0	0	$9,749	$0
City of Bastrop	6/2/2010	8:10 PM	43	0	0	$603	$0
Bastrop County	8/24/2010	3:45 PM	43	0	0	$6,024	$0
City of Elgin	8/14/2011	5:00 PM	52	0	0	$11,610	$0
Bastrop County	6/12/2012	5:00 PM	43	0	0	$1,146	$0
Bastrop County	8/18/2012	8:33 PM	50	0	0	$11,417	$0
Bastrop County	4/2/2013	5:47 PM	43	0	0	$2,262	$0
Bastrop County	4/7/2014	6:55 PM	48	0	0	$5,547	$0
City of Smithville	4/7/2014	7:30 PM	48	0	0	$2,219	$0
City of Elgin*	2015	Unknown	Unknown	0	0	$48,991	$0
City of Elgin*	2016	Unknown	Unknown	0	0	$117,524	$0
City of Elgin	5/23/2017	4:34 PM	65	0	0	$107,470	$0
City of Bastrop	4/13/2018	10:03 PM	52	0	0	$5,249	$0
City of Elgin*	2019	Unknown	Unknown	0	0	$15,389	$0
Bastrop County	5/3/2019	7:45 PM	56	0	0	$10,270	$0
City of Bastrop	5/30/2019	3:47 AM	61	0	0	$5,135	$0
Bastrop County	6/6/2019	3:03 PM	52	0	0	$5,134	$0
City of Bastrop	6/9/2019	6:30 PM	61	0	0	$5,134	$0
City of Smithville	1/10/2020	9:11 PM	65	0	0	$25,489	$0
City of Smithville	1/10/2020	9:12 PM	70	0	0	$10,195	$0
Bastrop County	5/28/2021	6:35 PM	70	0	0	$20,000	$0
TOTALS			**(Max Extent)**	**0**	**0**	**$1,934,081**	**$202,454**

Table 13-4. Summary of Historical Thunderstorm Wind Events, 1973-2021

JURISDICTION	NUMBER OF EVENTS	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Bastrop County	53	100 mph	0	0	$695,760	$164,347
City of Bastrop	20	70 mph	0	0	$463,566	$5,271
City of Elgin	16	65 mph	0	0	$463,399	$32,836
City of Smithville	11	70 mph	0	0	$123,852	$0
Bastrop ISD	0	N/A	0	0	$0	$0
Elgin ISD	5	Unknown	0	0	$187,504	$0
McDade ISD	0	N/A	0	0	$0	$0
Smithville ISD	0	N/A	0	0	$0	$0
Bastrop County MUD #1	0	N/A	0	0	$0	$0
Bastrop County WCID #2	0	N/A	0	0	$0	$0
Bastrop County WCID #3	0	N/A	0	0	$0	$0
TOTAL LOSSES	**100**	**(Max Extent)**	**0**	**0**	**$2,136,535**	

Based on the list of historical thunderstorm wind events for the Bastrop County planning area (listed above) 25 of the events have occurred since the 2016 Plan.

SIGNIFICANT EVENTS

March 19, 2002 – Bastrop County
The widespread derecho continued to blow down trees. Only spotty damage was indicated to roofs of homes and windows of cars and homes.

July 22, 2006 – Bastrop County
Severe thunderstorm winds blew the roof off a barn, damaged two other barns, and overturned a mobile home in the Cedar Creek area.

May 25, 2017 – City of Eglin
A thunderstorm produced wind gusts estimated at 75 mph that blew down trees and power lines in Elgin.

PROBABILITY OF FUTURE EVENTS

Most thunderstorm winds occur during the months of March, April, May, and September. Based on available records of historic events, there have been 95 events in a 49-year reporting period. This frequency supports a probability of one to two events every year. Even though the intensity

of thunderstorm wind events is not always damaging for the Bastrop County planning area, the frequency of occurrence for a thunderstorm wind event is highly likely. This means that an event is probable within the next year for the Bastrop County planning area, including all participating jurisdictions, ISDs, and special districts.

VULNERABILITY AND IMPACT

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

Trees, power lines and poles, signage, manufactured housing, radio towers, concrete block walls, storage barns, windows, garbage recepticles, brick facades, and vehicles, unless reinforced, are vulnerable to thunderstorm wind events. More severe damage involves windborne debris; in some instances, patio furniture and other lawn items have been reported to have been blown around by wind and, very commonly, debris from damaged structures in turn have caused damage to other buildings not directly impacted by the event. In numerous instances roofs have been reported as having been torn off of buildings. The portable buildings used at various locations within each ISD or special district, locations would be more vulnerable to thunderstorm wind events than typical site-built structures and could potentially pose a greater risk for wind-blown debris. In addition, some of the ISD structures feature roof top Air Conditioning Units that would be vulnerable to high winds flying debris. These structures would also be more vulnerable. These units would also pose the additional threat of contributing to flying debris, causing additional damages to campus structures.

The US Census data indicates a total of 7,672 manufactured homes (approximately 25.5%) located in the Bastrop County planning area, including all participating jurisdictions, ISDs, and special districts, (Table 13-5). In addition, 25.4% (approximately 7,612 structures) of the residential structures in the Bastrop County planning area were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant wind events.

Table 13-5. Structures at Greater Risk by Jurisdiction

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Bastrop County[6]	7,672	7,612
City of Bastrop	42	950
City of Elgin	213	1,407
City of Smithville	200	1,227
Bastrop ISD	-	-

[6] County totals includes all incorporated jurisdictions and unincorporated areas.

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
Elgin ISD	-	-
McDade ISD	-	-
Smithville ISD	-	-
Bastrop County MUD #1	0	3
Bastrop County WCID #2	0	1
Bastrop County WCID #3	0	0

The following critical facilities would be vulnerable to thunderstorm wind events in each participating jurisdiction:

Table 13-6. Critical Facilities at Risk by Jurisdiction

JURISDICTION	CRITICAL FACILITIES
Bastrop County	1 Animal Shelter, 2 Cancer Research Facilities, 7 Communications Facilities, 1 County 911 Dispatch Facility, 8 Government Facilities, 1 Detention Facility, 4 Educational Facilities, 3 Electric Cooperative Facilities, 1 EOC, 1 Emergency Services Facility, 1 Prison Facility, 13 Fire Station Facilities, 1 Gas Storage Facility, 2 Hazardous Material Facilities, 4 Vulnerable Population Residential Facilities, 4 Emergency Medical Facilities, 1 Military Training Facility, 1 Pipeline Transportation Facility, 1 Power Distribution Facility, 2 Power Generation Facilities, 2 Propane Distribution Facilities, 1 Rail Yard Facility, 4 Government Storage Facilities, 1 School Bus Transport Facility, 1 Sheriff's Office, 2 DOT Program Facilities, 1 Wastewater Treatment Plant, 2 Water Facilities
City of Bastrop	2 Bridges, 1 Government Facility, 2 Communications Facility, 1 Corrections Facility, 6 Educational Facilities, 2 Electric Substations, 1 Emergency Shelter, 2 Fire Station Facilities, 2 Emergency Medical Facilities, 2 Police Station Facilities (including 911 Center), 1 Government Storage Facility, 19 Wastewater Lift Stations, 2 Wastewater Treatment Facilities, 12 Water Well Facilities
City of Elgin	1 Emergency Evacuation Center, 1 Helicopter Landing Pad, 1 Emergency Medical Facility, 1 Police Station, 1 Fire Station, 1 Water Treatment Facility
City of Smithville	1 Government Facility, 1 Government Storage Facility, 2 Chemical Storage Facilities, 1 Communications Facility, 1 Emergency Shelter, 2 Fire Stations, 1 Municipal Airport, 1 Police Station, 3 Pump Stations, 2 Wastewater Chemical Facilities, 4

JURISDICTION	CRITICAL FACILITIES
	Wastewater Treatment Facilities, 1 Water System Facility, 6 Water Storage Facilities, 3 Water Well Facilities
Bastrop ISD	14 School Campus Locations (All facilities including schools, administration facilities, maintenance and operations facilities, service center, stadium, technology building, and transportation facility)
Elgin ISD	7 School Campus Locations (All facilities including schools, administration facilities, development center, maintenance and operations, nutrition services facility, technology building, and transportation facility)
McDade ISD	4 School Campus Locations (All facilities including schools, administration facilities, AG shop facility, band hall, maintenance and operations, nutrition services facility, technology building, and transportation facility)
Smithville ISD	4 School Campus Locations (All facilities including schools, administration facilities, and maintenance and operations facilities)
Bastrop County MUD #1	11 Services Office, 1 Operations Center, 1 Operations and Maintenance Firm, 1 Wastewater Plant, 1 Water Plant, 1 Water Facility, All Pipeline Infrastructure
Bastrop County WCID#2	1 Water Well and Pumping Station, All Pipeline Infrastructure
Bastrop County WCID#3	None

A thunderstorm wind event can also result in traffic disruptions, injuries and in rare cases, fatalities. Impact of thunderstorms winds experienced in the Bastrop County planning area has resulted in no injuries or fatalities. Impact of thunderstorm wind events experienced in the entire Bastrop County planning area would be “Limited,” and injuries and illnesses would be treatable with first aid, less than ten percent property damaged or destroyed, and facilities would be shut down for 24 hours or less. Overall, the average loss estimate (in 2021 dollars) is $2,136,535, having an approximate annual loss estimate of $43,603 (Table 13-7).

Table 13-7. Potential Annualized Losses by Jurisdiction

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Bastrop County	$860,107	$17,553
City of Bastrop	$468,837	$9,568
City of Elgin	$496,235	$10,127
City of Smithville	$123,852	$2,528
Bastrop ISD	$0	$0

SECTION 13: THUNDERSTORM WIND

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Elgin ISD	$187,504	$3,827
McDade ISD	$0	$0
Smithville ISD	$0	$0
Bastrop County MUD #1	$0	$0
Bastrop County WCID #2	$0	$0
Bastrop County WCID #3	$0	$0
Planning Area	**$2,136,535**	**$43,603**

ASSESSMENT OF IMPACTS

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

- Individuals exposed to the storm can be struck by flying debris, falling limbs, or downed trees causing serious injury or death.
- Structures can be damaged or crushed by falling trees, which can result in physical harm to the occupants.
- Significant debris and downed trees can result in emergency response vehicles being unable to access areas of the community.
- Downed power lines may result in roadways being unsafe for use, which may prevent first responders from answering calls for assistance or rescue.
- During exceptionally heavy wind events, first responders may be prevented from responding to calls, as the winds may reach a speed in which their vehicles and equipment are unsafe to operate.
- Thunderstorm wind events often result in widespread power outages increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.
- Extended power outage often results in an increase in structure fires and carbon monoxide poisoning, as individuals attempt to cook or heat their homes with alternate, unsafe cooking or heating devices, such as grills.
- First responders are exposed to downed power lines, unstable and unusual debris, hazardous materials, and generally unsafe conditions.
- Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications.
- Critical staff may be unable to report for duty, limiting response capabilities.
- City or county departments may be damaged, delaying response and recovery efforts for the entire community.
- Private sector entities that the City and its residents rely on, such as utility providers, financial institutions, and medical care providers may not be fully operational and may require assistance from neighboring communities until full services can be restored.

- Economic disruption negatively impacts the programs and services provided by the community due to short- and long-term loss in revenue.
- Some businesses not directly damaged by thunderstorm wind events may be negatively impacted while roads are cleared and utilities are being restored, further slowing economic recovery.
- Older structures built to less stringent building codes may suffer greater damage as they are typically more vulnerable to thunderstorm winds.
- Large scale wind events can have significant economic impact on the affected area, as it must now fund expenses such as infrastructure repair and restoration, temporary services and facilities, overtime pay for responders, and normal day-to-day operating expenses.
- Businesses that are more reliant on utility infrastructure than others may suffer greater damages without a backup power source.
- Activities at locations such as Lake Bastrop attract tourism including hiking, camping, boating, and fishing throughout the year. A large thunderstorm wind event could impact recreational activities, placing visitors in imminent danger, potentially requiring emergency services or evacuations.
- Recreational areas and parks may be damaged or inaccessible due to downed trees or debris, causing temporary impacts to area businesses.

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

SECTION 14: WINTER STORM

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HAZARD DESCRIPTION



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

Winter storms that threaten Bastrop County planning area usually begin as powerful cold fronts that push south from central Canada. Although the county is at risk to ice hazards, extremely cold temperatures, and snow, the effects and frequencies of winter storm events are generally mild and short-lived. As indicated in Figure 14-1, on average, the Bastrop County planning area, including all participating jurisdictions, ISDs, and special districts, typically experience approximately 11-17 extreme cold days a year, meaning up to 17 days are at or around freezing temperatures. During times of ice and snow accumulation, response times will increase until public works road crews are able to make major roads passable. Table 14-1 describes the types of winter storms possible to occur in the Bastrop County planning area including all participating jurisdictions, ISDs, and special district.

Figure 14-1. Extreme Cold Days, 1960-2003[1]

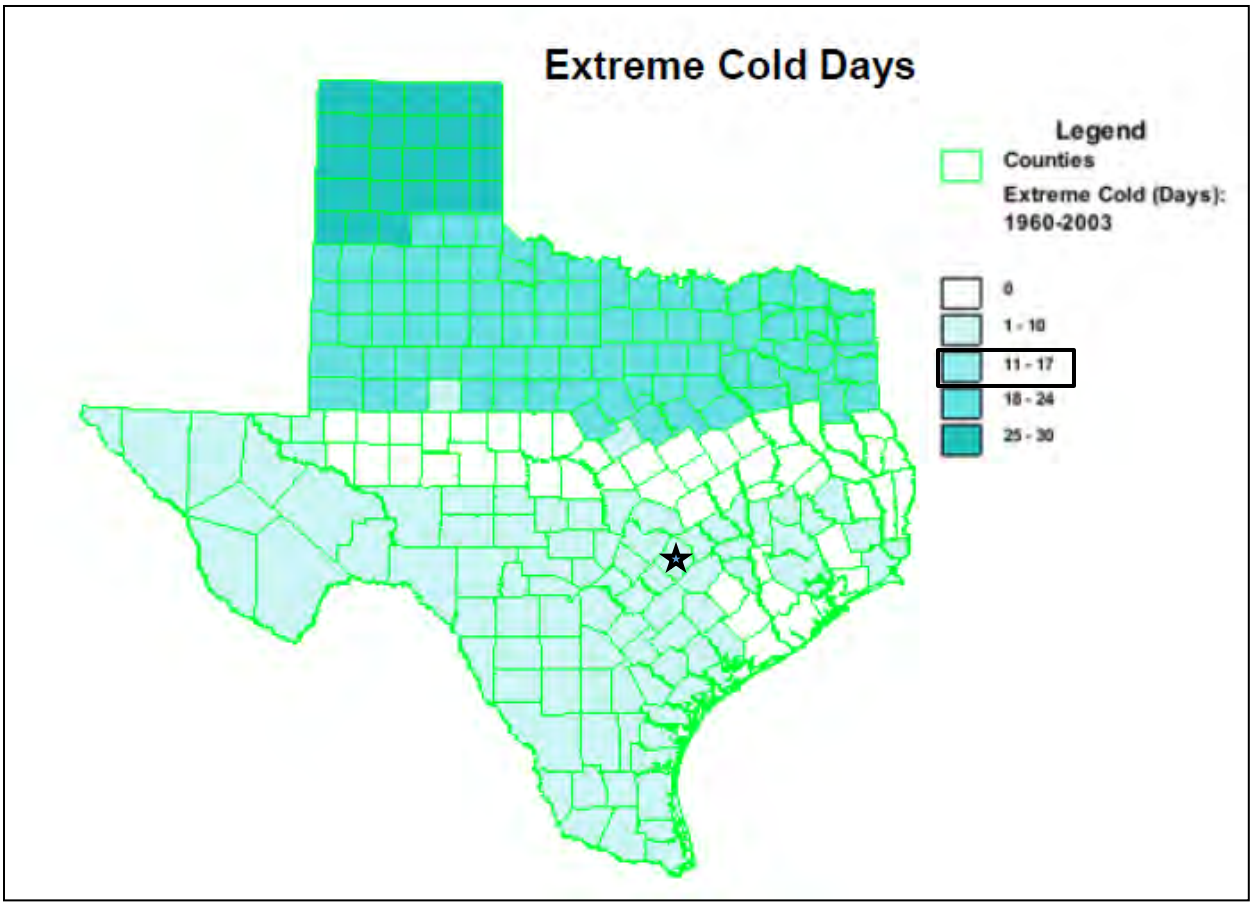


Table 14-1. Types of Winter Storms

TYPE OF WINTER STORM	DESCRIPTION
Winter Weather Advisory	This alert may be issued for a variety of severe conditions. Weather advisories may be announced for snow, blowing or drifting snow, freezing drizzle, freezing rain, or a combination of weather events.
Winter Storm Watch	Severe winter weather conditions may affect your area (freezing rain, sleet, or heavy snow may occur separately or in combination).
Winter Storm Warning	Severe winter weather conditions are imminent.
Freezing Rain or Freezing Drizzle	Rain or drizzle is likely to freeze upon impact, resulting in a coating of ice glaze on roads and all other exposed objects.
Sleet	Small particles of ice usually mixed with rain. If enough sleet accumulates on the ground, it makes travel hazardous.
Blizzard Warning	Sustained wind speeds of at least 35 mph are accompanied by considerable falling or blowing snow. This alert is the most perilous winter storm with visibility dangerously restricted.

[1] Source: National Weather Service. Bastrop County indicated by star.

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

LOCATION

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

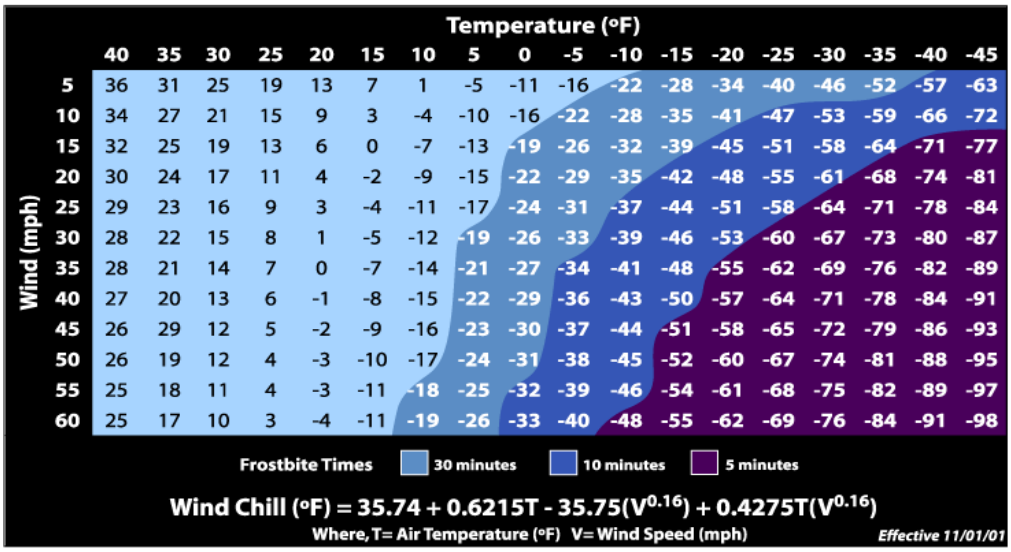
EXTENT

The extent or magnitude of a severe winter storm is measured in intensity based on the temperature and level of accumulations as shown in Table 14-2. Table 14-2 should be read in conjunction with the wind-chill factor described in Figure 14-2 to determine the intensity of a winter storm. The chart is not applicable when temperatures are over 50°F or winds are calm. This is an index developed by the National Weather Service.

Table 14-2. Magnitude of Severe Winter Storms

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

Figure 14-2. Wind Chill Chart



Wind (mph)	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45	26	29	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Wind chill temperature is a measure of how cold the wind makes real air temperature feel to the human body. Since wind can dramatically accelerate heat loss from the body, a blustery 30°F day would feel just as cold as a calm day with 0°F temperatures. The Bastrop County planning area, including all participating jurisdictions, ISDs, and special districts, has never experienced a blizzard, but based on 18 previous occurrences recorded from 1996 through September 2021, it has been subject to winter storm watches, warnings, freezing rain, sleet, snow, and wind chill.

The average number of cold days is similar for the entire planning area, including Bastrop County, all participating jurisdictions, ISDs, and special districts. Therefore, the intensity or extent of a winter storm event to be mitigated for the area ranges from mild to significant according to the definitions at Table 14-2. The entire Bastrop County planning area can expect anywhere between 0.1 to 4.0 inches of ice and snow during a winter storm event and temperatures between 20 and 50 degrees with winds ranging from 0 to 20 mph.

HISTORICAL OCCURRENCES

Table 14-3 shows historical occurrences for Bastrop County from 1996 through September 2021 provided by the NCEI database. There have been 18 recorded winter storm events in Bastrop County, including all participating jurisdictions, ISDs, and special districts. Historical winter storm information, as provided by the NCEI, identifies winter storm activity across a multi-county forecast area for each event. The appropriate percentage of the total property and crop damage reported for the entire forecast area has been allocated to each county impacted by the event. Historical winter storm data for the county, all participating jurisdictions, ISDs, and special districts, are provided on a County-wide basis per the NCEI database. Table 14-3 shows historical incident information for the planning area.

Table 14-3. Historical Winter Storm Events, 1996-2021[2]

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Bastrop County	2/1/1996	0	0	$0	$0
Bastrop County	12/23/1998	0	0	$0	$0
Bastrop County	12/13/2000	0	0	$0	$0
Bastrop County	2/25/2003	0	0	$0	$0
Bastrop County	1/15/2007	0	0	$0	$0
Bastrop County	12/9/2008	0	0	$0	$0
Bastrop County	2/3/2011	0	0	$0	$0
Bastrop County	2/9/2011	0	0	$0	$0
Bastrop County	12/7/2013	0	0	$0	$0
Bastrop County	12/5/2013	0	0	$0	$0
Bastrop County	2/6/2014	0	0	$0	$0
Bastrop County	1/23/2014	0	0	$0	$0
Bastrop County	12/7/2017	0	0	$0	$0
Bastrop County	1/16/2018	0	0	$0	$0
Bastrop County	2/5/2020	0	0	$0	$0
Bastrop County	1/10/2021	0	0	$0	$0
Bastrop County	2/13/2021	0	0	$0	$0
Bastrop County	2/16/2021	0	0	$0	$0
TOTALS		**0**	**0**	**$0**	**$0**

Based on the list of historical winter storm events for the Bastrop County planning area (listed above) 6 of the events have occurred since the 2016 Plan.

SIGNIFICANT EVENTS

January 16, 2018 – Bastrop County
A cold front brought a shallow layer of subfreezing air to South Central Texas. Isentropic lift of warm moist air over this shallow cold layer led to wintry precipitation. Most of the precipitation was freezing rain and sleet, but there was some snow toward the end of the event. There were reports of 1/8 inch of ice accumulated in Leon Valley, New Braunfels, and San Geronimo. Icy roads were

[2] Values are in 2021 dollars. Historical events are reported from January 1996 through September 2021.

a problem across the region. Ice closed many roads across the region and caused numerous vehicle accidents.

February 16-18, 2021 - Bastrop County
Freezing rain caused roads to ice quickly. An estimated quarter inch of ice accumulated on driveways near Cedar Creek

PROBABILITY OF FUTURE EVENTS

According to historical records, the planning area experiences approximately one winter storm event every one to two years. Hence, the probability of a future winter storm event affecting the Bastrop County planning area, including all participating jurisdictions, ISDs, and special districts, is highly likely, with a winter storm likely to occur within the next year.

VULNERABILITY AND IMPACT

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

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

All populations, buildings, critical facilities, and infrastructure in the entire Bastrop County planning area, including all participating jurisdictions, ISDs, and special districts, are vulnerable to severe winter events.

The following critical facilities would be vulnerable to Winter Storm events in each participating jurisdiction:

Table 14-4. Critical Facilities by Jurisdiction

JURISDICTION	CRITICAL FACILITIES
Bastrop County	1 Animal Shelter, 2 Cancer Research Facilities, 7 Communications Facilities, 1 County 911 Dispatch Facility, 8 Government Facilities, 1 Detention Facility, 4 Educational Facilities, 3 Electric Cooperative Facilities, 1 EOC, 1 Emergency Services Facility, 1 Prison Facility, 13 Fire Station Facilities, 1 Gas Storage Facility, 2 Hazardous Material Facilities, 4 Vulnerable Population Residential Facilities, 4 Emergency Medical Facilities, 1 Military Training Facility, 1 Pipeline Transportation Facility, 1 Power Distribution Facility, 2 Power Generation Facilities, 2 Propane Distribution Facilities, 1 Rail Yard Facility, 4 Government Storage Facilities, 1 School Bus Transport Facility, 1 Sheriff's Office, 2 DOT Program Facilities, 1 Wastewater Treatment Plant, 2 Water Facilities

JURISDICTION	CRITICAL FACILITIES
City of Bastrop	2 Bridges, 1 Government Facility, 2 Communications Facility, 1 Corrections Facility, 6 Educational Facilities, 2 Electric Substations, 1 Emergency Shelter, 2 Fire Station Facilities, 2 Emergency Medical Facilities, 2 Police Station Facilities (including 911 Center), 1 Government Storage Facility, 19 Wastewater Lift Stations, 2 Wastewater Treatment Facilities, 12 Water Well Facilities
City of Elgin	1 Emergency Evacuation Center, 1 Helicopter Landing Pad, 1 Emergency Medical Facility, 1 Police Station, 1 Fire Station, 1 Water Treatment Facility
City of Smithville	1 Government Facility, 1 Government Storage Facility, 2 Chemical Storage Facilities, 1 Communications Facility, 1 Emergency Shelter, 2 Fire Stations, 1 Municipal Airport, 1 Police Station, 3 Pump Stations, 2 Wastewater Chemical Facilities, 4 Wastewater Treatment Facilities, 1 Water System Facility, 6 Water Storage Facilities, 3 Water Well Facilities
Bastrop ISD	14 School Campus Locations (All facilities including schools, administration facilities, maintenance and operations facilities, service center, stadium, technology building, and transportation facility)
Elgin ISD	7 School Campus Locations (All facilities including schools, administration facilities, development center, maintenance and operations, nutrition services facility, technology building, and transportation facility)
McDade ISD	4 School Campus Locations (All facilities including schools, administration facilities, AG shop facility, band hall, maintenance and operations, nutrition services facility, technology building, and transportation facility)
Smithville ISD	4 School Campus Locations (All facilities including schools, administration facilities, and maintenance and operations facilities)
Bastrop County MUD #1	11 Services Office, 1 Operations Center, 1 Operations and Maintenance Firm, 1 Wastewater Plant, 1 Water Plant, 1 Water Facility, All Pipeline Infrastructure
Bastrop County WCID#2	1 Water Well and Pumping Station, All Pipeline Infrastructure
Bastrop County WCID#3	None

People and animals are subject to health risks from extended exposure to cold air. Elderly people are at greater risk of death from hypothermia during these events, especially in the rural areas of the county where populations are sparse, icy roads may impede travel, and there are fewer neighbors to check in on the elderly. According to the U.S. Center for Disease Control, every year hypothermia kills about 600 Americans, half of whom are 65 years of age or older. In addition, populations living below the poverty level may not be able to afford to run heat on a regular basis

Population over 65 in the entire Bastrop County planning area is estimated at 14.6% of the total population or an estimated total of 12,303[3] potentially vulnerable residents in the planning area based on age. Children under five in the planning area is estimated at 6.5%, or approximately 5,519. An estimated 11.2% of the planning area population live below the poverty level (Table 14-5).

Table 14-5. Population at Greater Risk by Jurisdiction

JURISDICTION	POPULATION 65 AND OLDER	POPULATION UNDER 5	POPULATION BELOW POVERTY LEVEL
Bastrop County	12,303	5,519	9,466
City of Bastrop	1,555	812	1,158
City of Elgin	1,161	727	1,339
City of Smithville	1,060	246	393
Bastrop ISD	-	389	-
Elgin ISD	-	214	-
McDade ISD	-	14	-
Smithville ISD	-	60	-

All Independent School Districts are also at risk from winter storm events. Power outages at schools without emergency generators could make the schools unsafe for students to attend. Each ISD will also have to consider the safety of the students during the transportation to and from the schools, if roadways are closed, unsafe, or obstructed. There is also a risk as sporting events and practices at ISD athletic fields where events are typically held outside during late fall or early winter when temperatures begin to lower. Ice storms during the school day can lead to early school closings often combined with hazardous driving conditions. The risk of injury to students and faculty will be elevated along walkways and parking lots as well as access and secondary roads. In addition, participating ISDs employ 224 people and the special districts employ 15 people who frequently work outdoors and may be at greater risk during winter storm events.

Historic loss for winter storm events is considered negligible. The potential severity of impact for the Bastrop County planning area, including all participating jurisdictions, ISDs, and special districts, are “Limited” meaning injuries are treatable with first aid, shutdown of facilities and services for 24 hours or less, and less than 10% of property destroyed or with major damage.

Annualized losses are not included for participating ISDs or any special district as there have not been events or losses to affect these entities separate and apart from a historical occurrence for their location.

[3] US Census Bureau 2019 data for Bastrop County.

Table 14-6. Potential Annualized Losses for Bastrop County Planning Area

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
Bastrop County	$0	$0

ASSESSMENT OF IMPACTS

The greatest risk from a winter storm hazard is to public health and safety. Potential impacts for the planning area may include:

- Vulnerable populations, particularly the elderly and young children, can face serious or life-threatening health problems from exposure to extreme cold including hypothermia and frostbite.
- Loss of electric power or other heat source can result in increased potential for fire injuries or hazardous gas inhalation because residents burn candles for light or use fires or generators to stay warm.
- Response personnel, including utility workers, public works personnel, debris removal staff, tow truck operators, and other first responders, are subject to injury or illness resulting from exposure to extreme cold temperatures.
- Response personnel would be required to travel in potentially hazardous conditions, elevating the life safety risk due to accidents and potential contact with downed power lines.
- Operations or service delivery may experience impacts from electricity blackouts due to winter storms.
- Power outages are possible throughout the planning area due to downed trees and power lines and/or rolling blackouts.
- Critical facilities without emergency backup power may not be operational during power outages.
- Emergency response and service operations may be impacted by limitations on access and mobility if roadways are closed, unsafe, or obstructed.
- Hazardous road conditions will likely lead to increases in automobile accidents, further straining emergency response capabilities.
- Depending on the severity and scale of damage caused by ice and snow events, damage to power transmission and distribution infrastructure can require days or weeks to repair.
- A winter storm event could lead to tree, shrub, and plant damage or death.
- Severe cold and ice could significantly damage agricultural crops.
- Schools may be forced to shut early due to treacherous driving conditions.
- Exposed water pipes may be damaged by severe or late season winter storms at both residential and commercial structures, causing significant damages.

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

SECTION 15: DAM AND LEVEE FAILURE

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Vulnerability and Impact 8
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HAZARD DESCRIPTION

DAMS

Dams are water storage, control, or diversion structures that impound water upstream in reservoirs. Dam failure can take several forms, including a collapse of or breach in the structure. While most dams have storage volumes small enough that failures have few or no repercussions, dams storing large amounts can cause significant flooding downstream. Dam failures can result from any one or a combination of the following causes:

- Prolonged periods of rainfall and flooding, which cause most failures;
- Inadequate spillway capacity, resulting in excess overtopping of the embankment;
- Internal erosion caused by embankment or foundation leakage or piping;
- Improper maintenance, including failure to remove trees, repair internal seepage problems, or maintain gates, valves, and other operational components;
- Improper design or use of improper construction materials;
- Failure of upstream dams in the same drainage basin;
- High winds, which can cause significant wave action and result in substantial erosion;
- Destructive acts of terrorism; and,
- Earthquakes, which typically cause longitudinal cracks at the tops of the embankments, leading to structural failure.

Benefits provided by dams include water supplies for drinking; irrigation and industrial uses; flood control; hydroelectric power; recreation; and navigation. At the same time, dams also represent a risk to public safety. Dams require ongoing maintenance, monitoring, safety inspections, and sometimes even rehabilitation to continue safe service.

In the event of a dam failure, the energy of the water stored behind the dam is capable of causing rapid and unexpected flooding downstream, resulting in loss of life and substantial property damage. A devastating effect on water supply and power generation could be expected as well. The terrorist attacks of September 11, 2001 generated increased focus on protecting the country's infrastructure, including ensuring the safety of dams.

One major issue with the safety of dams is their age. The average age of America's 84,000 dams is 52 years. According to statistics released in 2009 by the Association of State Dam Safety Officials[1], more than 2,000 dams near population centers are in need of repair. In addition to the continual aging of dams, there have not been significant increases in the number of safety inspectors resulting in haphazard maintenance and inspection.

The Association of State Dam Safety Officials estimate that $16 billion will be needed to repair all high-hazard dams, but the total for all state dam-safety budgets is less than $60 million[2]. The current maintenance budget does not match the scale of America's long-term modifications of its watersheds. Worse still, more people are moving into risky areas. As the American population grows, dams that once could have failed without major repercussions are now upstream of cities and development.



LEVEE

A levee is simply a man-made embankment built to keep a river from overflowing its banks or to prevent ocean waves from washing into undesired areas. A levee is typically little more than a mound of less permeable soil, like clay, wider at the base and narrower at the top. These mounds run in a long strip in varying height, sometimes for many miles, along a river, lake, or ocean. But there's no set height for levees. Their measurements vary according to the storms the area receives, even if those storms occur only once every hundred or thousand years.

Living by the water provides humans with a number of advantages: fertile farmland, transportation, trade, and hydroelectric power. Levees allow humans to enjoy these assets without fear of flooding. But humans often forget how powerful waters behind a levee can be. In 1927, the Mississippi River swelled under heavy rains, charging through a line of levees and

[1] Association of State Dam Safety Officials, Journal of Dam Safety
[2] Source: www.damsafety.org

flooding an area the size of Ireland. In 1953, the North Sea broke through the Netherland's ancient system of dikes and killed thousands.

In 2005, New Orleans made international news when Hurricane Katrina breached its levees. Much of the city lies 10 feet (3 meters) below sea level. Over the course of the city's history, low-lying, boggy areas have been pumped dry to create new land. Much of this reclaimed land has sunk as it dried out. The entire city now depends on the levees, along with massive pumping stations, to keep the water out.

LOCATION

The State of Texas has 7,413 dams, all regulated by the Texas Commission on Environmental Quality (TCEQ). The National Dam Safety Review Board (in coordination with FEMA) and the National Inventory of Dams (NID) lists a total of thirty-five dams or levees in or near the Bastrop County planning area, including all participating jurisdictions (complete list located in Appendix D). Each of these dams were analyzed individually by location, volume, elevation, and condition (where available) when determining the risk, if any, for each dam. Each dam or levee site was further analyzed for potential risks utilizing FEMA's National Flood Hazard Layer (where available) to map locations and fully understand development near the dam or levee and topographical variations that may increase risk.

Most of the dams listed were embankments for typically dry detention drainage areas, irrigation reservoirs, or shored up stream embankments. These types of structures are utilized for flood control and irrigation and do not pose a dam or levee failure risk. Other dams in the planning area feature such limited storage capacity that they pose no risk to structures, infrastructure, or citizens. Dams that were deemed to pose no past, current, or future risk to the planning area are not profiled in the plan as no loss of life or impact to critical facilities or infrastructure is expected in the event of a breach. Based on this detailed analysis, the planning team was able to determine that only four of the thirty-five dams pose a risk to the planning area.

The jurisdictions profiling dam or levee failure include Bastrop County, the City of Bastrop, Bastrop ISD, and the City of Smithville. These dams, listed in Table 15-1, are profiled in detail in the Extent section of this hazard profile. Figure 15-1 illustrates the general location for the critical dams in the planning area. While inundation maps are not available for the profiled dams, an estimated inundation radius has been included on the location map for each profiled dam or levee (indicated by the red circle). For dams with a maximum storage capacity of 100,000 acre-feet or more, all structures within five miles are considered to be at risk to potential dam or levee failure hazards. For dams with a maximum storage capacity between 10,000 and 100,000 acre-feet, all structures within three miles are considered to be at risk to potential dam or levee failure hazards. For dams with a maximum storage capacity of less than 10,000 acre-feet, all structures within one mile are considered to be at risk to potential dam or levee failure hazards. It should be noted that the City of Elgin, Elgin ISD, McDade ISD, Smithville ISD, Bastrop County MUD #1, Bastrop County WCID #2 and Bastrop County WCID #3 are not located within any of the estimated inundation zones. These participating entities will not profile dam or levee failure as a hazard for their location.

Figure 15-1. Critical Dam and Levee Locations

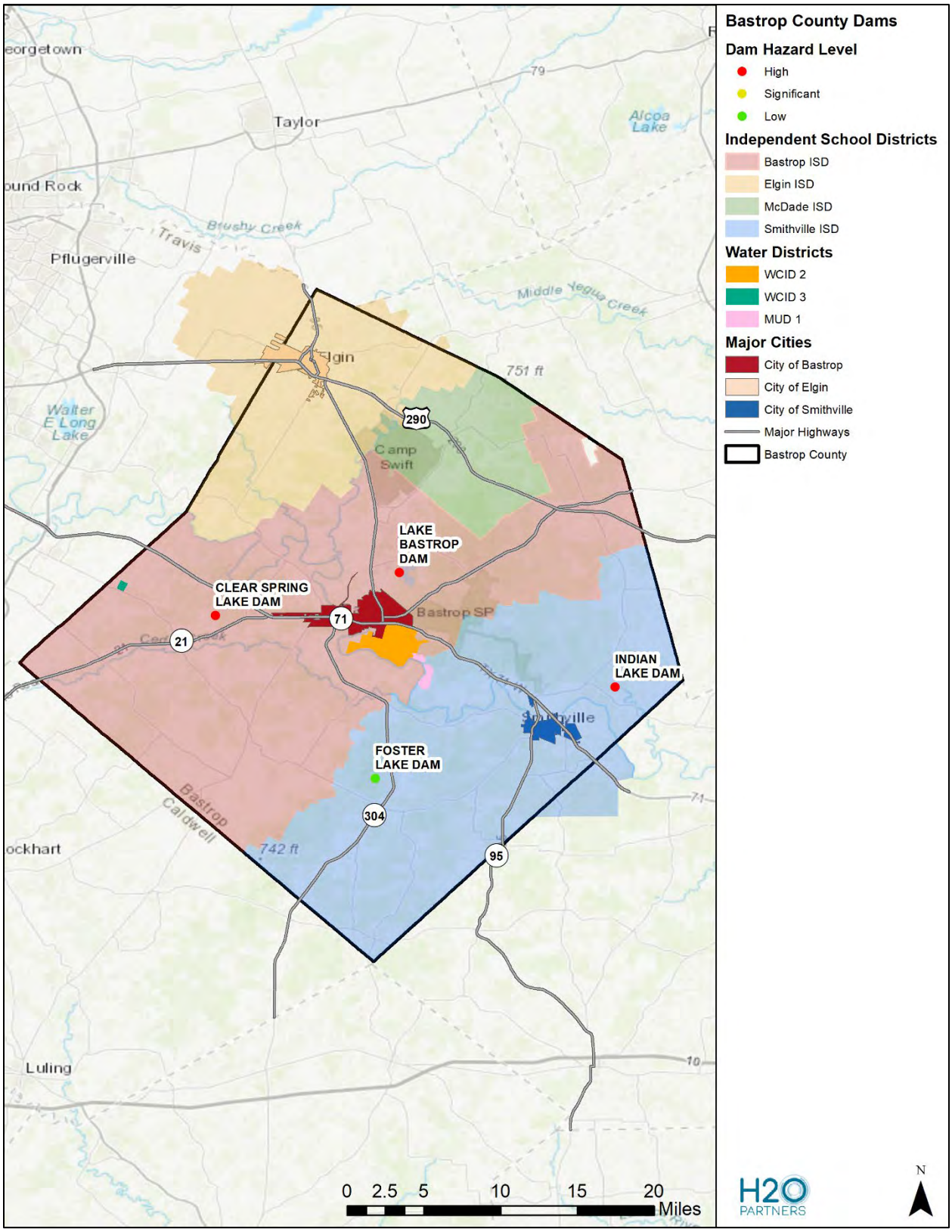


Table 15-1. Bastrop County Dam and Levee Survey

JURISDICTION	DAM OR LEVEE NAME	HEIGHT (Ft.)	STORAGE (Acre Ft.)	CONDITION	Hazard Classification
Bastrop County	Clear Spring Lake Dam	24	350	Unsatisfactory	High
Bastrop County	Indian Lake Dam	36	822	Fair	High
City of Bastrop / Bastrop County	Lake Bastrop Dam	88	24,700	Satisfactory	High
City of Smithville / Bastrop County	Foster Lake Dam	35	1,200	Not Rated	Low

EXTENT

The extent or magnitude of a dam or levee failure event is described in terms of the classification of damages that could result from a dam's failure, not the probability of failure. For dams with a maximum storage capacity of 100,000 acre-feet or more, all census blocks within five miles are considered to be at risk to potential dam or levee failure hazards. For dams with a maximum storage capacity between 10,000 and 100,000 acre-feet, all census blocks within three miles are considered to be at risk to potential dam or levee failure hazards. For dams with a maximum storage capacity of less than 10,000 acre-feet, all census blocks within one mile are considered to be at risk to potential dam or levee failure hazards.

Clear Spring Lake Dam:
Clear Spring Lake Dam is located in unincorporated Bastrop County on Greens Creek. The dam was constructed in 1950 and is used primarily for recreation. It is privately owned by the Friends of Clear Springs Lake and is regulated by TCEQ. The area located near the dam is rural with limited development within a one-mile radius. Approximately 25 residential structures and outbuildings and access roads could be impacted by a breach. A dam failure could cause limited infrastructure damages, power outages, and utility systems disruptions. In the event of a breach, it is estimated the average breach width would be 90.9 feet with a maximum breach flow of 12,313 cubic feet per second according to the National Weather Service (NWS) Dam Break Equation. A dam breach could result in an estimated depth up to 10 feet with the highest depth in the immediate area of the dam breach.

Indian Lake Dam:
Indian Lake Dam is located in unincorporated Bastrop County on a tributary of the Gravelly Creek. The dam was constructed in 1962 and is used primarily for recreational purposes. It is privately owned by the Indian Lake Owners Association and is regulated by TCEQ. A breach should follow the path of the channel, but it is anticipated that the water released by the breach could temporarily exceed the capacity and overflow the banks of the channel for approximately one mile. The area located near the dam is semi-densely populated within a one-mile radius. Approximately 100 residential structures and outbuildings, 5 commercial structures, and several access roads could be impacted by a breach. A dam failure could cause limited infrastructure damages, power outages, and utility systems disruptions. In the event of a breach, it is estimated the average breach width would be 124.6 feet with a maximum breach flow of 17,664 cubic feet per second

according to the National Weather Service (NWS) Dam Break Equation. A dam breach could result in an estimated depth up to 15 feet with the highest depth in the immediate area of the dam breach.

Foster Lake Dam:
Foster Lake Dam is located in the City of Smithville on a tributary of the Piney Creek. A breach should follow the path of the tributary, but it is anticipated that the water released by the breach could temporarily exceed the capacity and overflow the banks of the tributary for approximately one mile. The dam was constructed in 1964 and is used primarily for water supply. It is privately owned by an individual and is regulated by TCEQ. The area located near the dam is rural with limited development within a one-mile radius. Approximately 20 residential structures and outbuildings and several access roads could be impacted by a breach. No critical facilities would be impacted. A dam failure could cause limited infrastructure damages, power outages, and utility systems disruptions. In the event of a breach, it is estimated the average breach width would be 136.0 feet with a maximum breach flow of 1.598 cubic feet per second according to the National Weather Service (NWS) Dam Break Equation. A dam breach could result in an estimated depth up to 15 feet with the highest depth in the immediate area of the dam breach.

Lake Bastrop Dam:
Lake Bastrop Dam is located in the City of Bastrop on Spicer Creek. A breach should follow the path of the creek, but it is anticipated that the water released by the breach could temporarily exceed the capacity and overflow the banks of the creek for approximately three miles. The dam was constructed in 1964 and is used primarily for recreation and as a power plant cooling pond. It is owned by the Lower Colorado River Authority and is regulated by TCEQ. The area located near the dam is densely populated within a three-mile radius. Approximately 600-800 residential structures and outbuildings, multiple commercial structures (including several churches, an RV park, and high school) and several thoroughfares and access roads could be impacted by a breach. A dam failure could cause limited infrastructure damages, power outages, and utility systems disruptions. In the event of a breach, it is estimated the average breach width would be 364.8 feet with a maximum breach flow of 190,815 cubic feet per second according to the National Weather Service (NWS) Dam Break Equation. A dam breach could result in an estimated depth up to 25 feet with the highest depth in the immediate area of the dam breach.

Table 15-2 represents the extent or magnitude of a dam or levee failure event that could be expected for the Bastrop County planning area for each profiled dam.

Table 15-2. Extent by Jurisdiction

JURISDICTION	PROFILED DAM	EXTENT (FLOW DEPTH)	LEVEL OF INTENSITY TO MITIGATE
Bastrop County	Clear Spring Lake Dam	0-10 Feet	Dam failure presents a moderate threat for the county due to the dams condition. Loss of life is not expected. While some residential structures could be impacted, the greatest threat in the event of a breach would be localized flooding. Some infrastructure and utilities could be minimally impacted. Economic loss would be minimal.

JURISDICTION	PROFILED DAM	EXTENT (FLOW DEPTH)	LEVEL OF INTENSITY TO MITIGATE
Bastrop County	Indian Lake Dam	0-15 Feet	Dam failure presents a low threat for the county. Loss of life is not expected. While some residential and commercial structures could be impacted, the greatest threat in the event of a breach would be localized flooding. Some infrastructure and utilities could be minimally impacted. Economic loss would be minimal.
City of Smithville / Bastrop County	Foster Lake Dam	0-15 Feet	Dam failure presents a low threat for the city and county. Loss of life is not expected. While some residential and commercial structures could be impacted, the greatest threat in the event of a breach would be localized flooding. Critical facilities would not be impacted. Some infrastructure and utilities could be minimally impacted. Economic loss would be minimal.
City of Bastrop / Bastrop County	Lake Bastrop Dam	0-25 Feet	Dam failure presents a low threat for the city and county due to the dam's condition. Loss of life could be anticipated depending on the breach conditions. While a significant number of residential and commercial structures could be impacted, the greatest threat in the event of a breach would be localized flooding. Some critical facilities could be minimally impacted. Some infrastructure and utilities could be minimally impacted. Economic loss would be minimal.

HISTORICAL OCCURRENCES

The State of Texas has not experienced loss of life or extensive economic damage due to a dam or levee failure since the first half of the twentieth century. However, there may be many incidents that are not reported and, therefore, the actual number of incidents is likely to be greater.

There has been one recorded dam failure event for the planning area. On May 25, 2015, the Bastrop State Park Lake dam failed after excessive rains. Water from the 10-acre lake ran down Copperas Creek to the Colorado River. No infrastructure or structures were damaged, and no injuries were reported as a result of the breach. The Bastrop State Park Lake dam was classified as a “low-hazard” by TCEQ, meaning it did not have people or roads that would be affected if it failed. No other dam failures were reported for the planning area.

SECTION 15: DAM AND LEVEE FAILURE

PROBABILITY OF FUTURE EVENTS

Only one historical event has been recorded in the Bastrop County planning area. The risk of dam or levee failure is monitored closely, particularly on those dams that could cause damages or injuries. The probability of a future event is unlikely for those jurisdictions profiling dam or levee failure as a hazard, meaning an event is possible in the next ten years.

VULNERABILITY AND IMPACT

There are thirty-five dams or levees in or near the Bastrop County planning area. All dams or levees were evaluated in-depth to determine the risk, if any, associated with each dam. This analysis indicated four dams or levees in the planning area that presents a risk to structures or infrastructure in the planning area.

Flooding is the most prominent effect of dam or levee failure. If the dam or levee failure is extensive, a large amount of water would enter the downstream waterways forcing them out of their banks. There may be significant environmental effects, resulting in flooding that could disperse debris and hazardous materials downstream that can damage local ecosystems. If the event is severe, debris carried downstream can block traffic flow, cause power outages, and disrupt local utilities, such as water and wastewater, which could result in school closures. For specific vulnerability, please refer to the narrative for each dam or levee under the Extent section of this profile.

Annualized loss-estimates for dam or levee failure are not available; neither is there a breakdown of potential dollar losses for critical facilities, infrastructure and lifelines, or hazardous-materials facilities. If a significant dam or levee should fail, however, the severity of impact for the planning area would likely be minimal.

The severity of impact from a dam or levee breach would be “Limited,” meaning it could result in injuries that can be treated with first-aid, critical facilities being shut down for 24-hours or less and less than 10% of the property in the estimated breach inundation area destroyed or with major damage. For these reasons, creating mitigation actions to remove or protect people and structures from the path of destruction is necessary in order to minimize impact from dam or levee failure.

ASSESSMENT OF IMPACTS

Any individual dam or levee has a very specific area that will be impacted by a catastrophic failure. Dams identified as high or significant hazard can directly threaten the lives of individuals living or working in the inundation zone below the dam. The impact from any catastrophic failure would be similar to that of a flash flood. The impact of climate change could produce greater risk of dam or levee failures due to larger more frequent floods, exacerbating the current dam or levee failure impacts. Increased dam or levee failure threats can be associated with a variety of impacts, including:

- There could be injuries from impacts with debris carried by the flood.
- Individuals involved in the cleanup may be at risk from the debris left behind.
- Continuity of operations for any jurisdiction outside the direct impact area could be very limited.
- Roads and bridges could be destroyed.
- Homes and businesses could be damaged or destroyed.

- Emergency services may be temporarily unavailable.
- Disruption of operations and the delivery of services in the impacted area.
- A large dam or levee with a high head of water could effectively scour the terrain below it for miles, taking out all buildings and other infrastructure.
- Scouring force could erode soil and any buried pipelines.
- Scouring action of a large dam or levee will destroy all vegetation in its path.
- Wildlife and wildlife habitat caught in the flow will likely be destroyed.
- Fish habitat will likely be destroyed.
- Topsoil will erode, slowing the return of natural vegetation.
- The destructive high velocity water flow may include substantial debris and hazardous materials, significantly increasing the risks to life and property in its path.
- Debris and hazardous material deposited downstream may cause further pollution of areas far greater than the inundation zone.
- Destroyed businesses and homes may not be rebuilt, reducing the tax base and impacting long term economic recovery.
- Historical or cultural resources may be damaged or destroyed.
- Recreational activities and tourism may be temporarily unavailable or unappealing, slowing economic recovery.

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

SECTION 16: EARTHQUAKE

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HAZARD DESCRIPTION

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

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

According to the U.S. Geological Society (USGS) Earthquake Hazards Program, an earthquake hazard is anything associated with an earthquake that may influence an individual's normal activities. Table 16-1 describes definition of examples.

Table 16-1. Definitions of Earthquake Hazards[1]

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

[1] Source: USGS, 2012

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

LOCATION

Earthquake hazard areas are mapped by the US Geological Survey from lowest hazard to highest hazard areas. Figure 16-1 shows major earthquake hazard areas. An Earthquake Hazard Map, also known as a Percent Peak Ground Accelerations (%PGA) Map. The map shows the %PGA values with a 4% chance of being exceeded over 50 years. %PGA is an earthquake measurement that displays three things: the geographic area affected (all colored areas on the map), the probability of an earthquake of each given level of severity (2% chance in 50 years), and the strength of ground movement (severity) shown as percent of the acceleration force of gravity (%g) (the PGA is indicated by color). The Bastrop County Planning Area including all participating jurisdictions, ISDs, and special districts, is identified in Table 16-1, is located in a low hazard area of 0-8%g peak ground acceleration.

Figure 16-1. U.S. Map of Peak Ground Acceleration

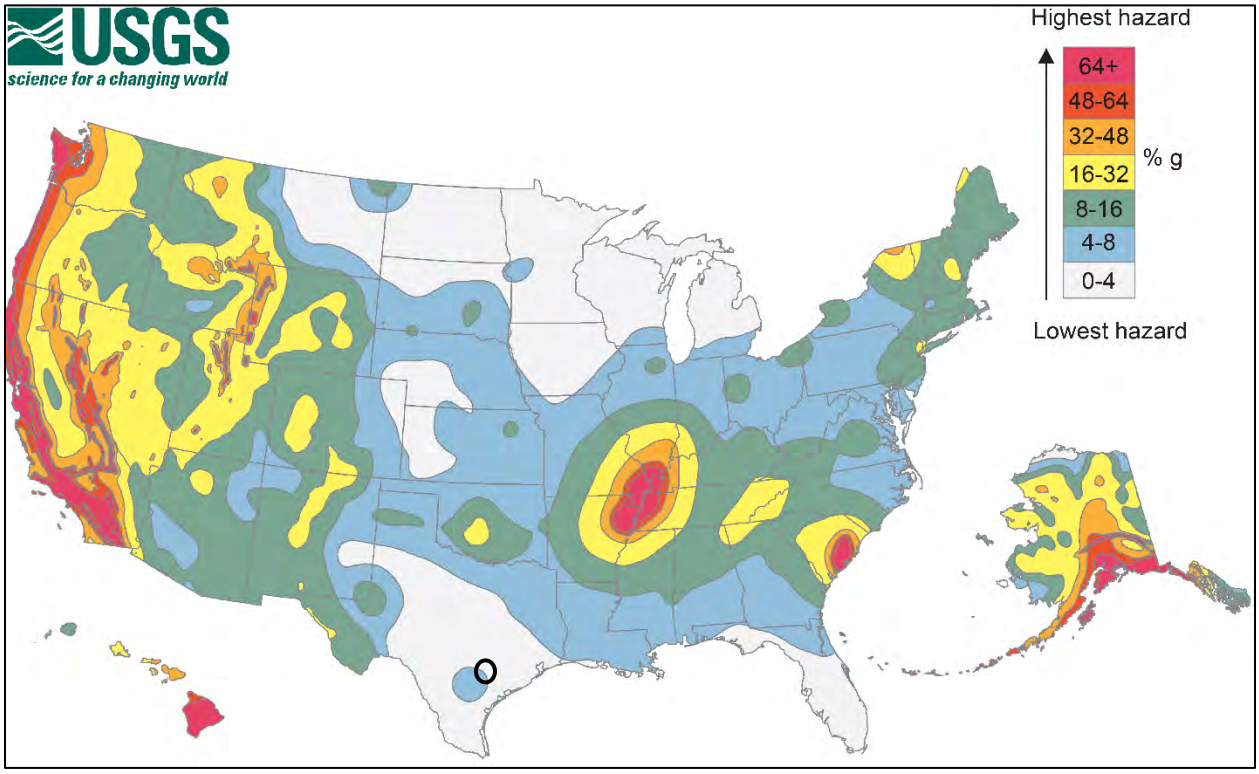
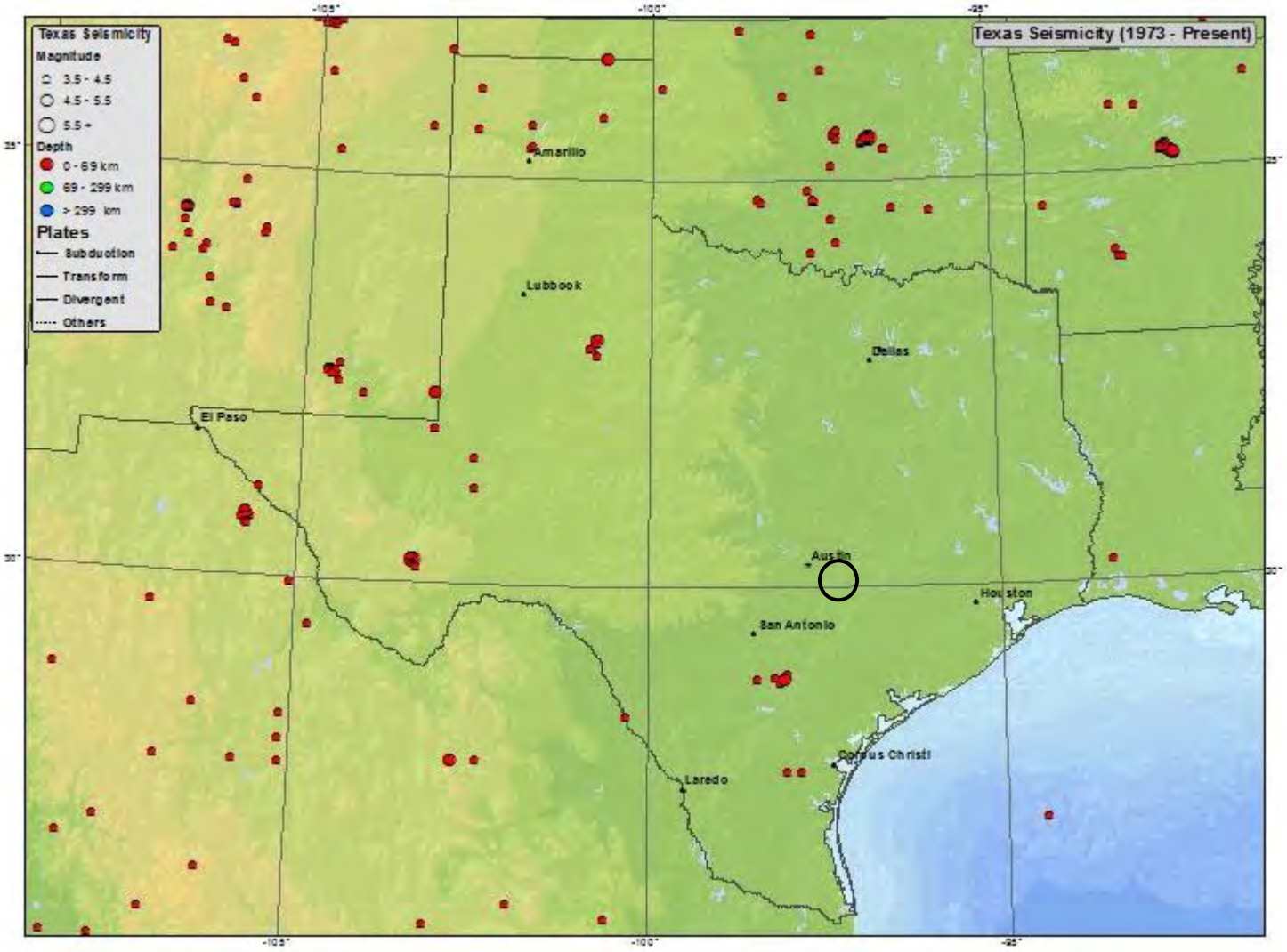


Figure 16-2 maps historic earthquake epicenters across Texas between 1973 and 2012.

Figure 16-2. Historic Earthquake Epicenters in Texas, 1973-2012



EXTENT

The magnitude, or intensity of an earthquake, is a recorded value of the amplitude of seismic waves. The Richter scale is the most commonly used scale that measures the magnitude of earthquakes. It has no upper limit and is not used to describe damage (Table 16-2).

Table 16-2. Richter Scale

RICHTER MAGNITUDES	EARTHQUAKE EFFECTS
2.5 or LESS	Usually not felt, but can be recorded by seismograph
2.5-5.4	Often felt, but only causes minor damage
5.5-6.0	Slight damage to buildings and other structures
6.1 TO 6.9	May cause a lot of damage in very populated areas

RICHTER MAGNITUDES	EARTHQUAKE EFFECTS
7.0 TO 7.9	Major earthquake; serious damage
8 OR GREATER	Great earthquake; can totally destroy communities near the epicenter

The intensity of an earthquake is expressed by the Modified Mercalli Scale, based on the effects of ground shaking on people, buildings, and natural features, and is location dependent. The Modified Mercalli Scale gives the intensity of the earthquake in values ranging from I to XII. Table 16-3 summarizes earthquake intensity as described by the Modified Mercalli Scale and provides a comparison between the Richter and Modified Mercalli Intensity Scales.

Table 16-3. Modified Mercalli Intensity (MMI) Scale

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

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

Table 16-4 lists the Modified Mercalli Intensity (MMI) with the corresponding Acceleration (%g) (PGA), as well as the perceived shaking and potential damage expected.

Table 16-4. Modified Mercalli Intensity (MMI) and PGA Equivalents

MMI	ACCELERATION (%g) (PGA)	PERCEIVED SHAKING	POTENTIAL DAMAGE
I	<.17	Not Felt	None
II	.17-1.4	Weak	None
III	.17-1.4	Weak	None

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

Taking into consideration the possible extent of an earthquake for the area, by reviewing Tables 16-2 through 16-4 in conjunction with previous occurrences as depicted in Figure 16-2, Bastrop County Planning Area, including all participating jurisdictions, ISDs and special districts, experience on average less than 2.5 Richter Scale or Level IV or instrumental impact based on the Modified Mercalli intensity scale. This is the greatest extent the entire planning area can anticipate in the future.

HISTORICAL OCCURRENCES

According to USGS, and the National Geophysical Data Center (NGDC), there are no “significant” earthquakes on record for the state of Texas and the entire Bastrop County Planning Area from 2150 B.C. to present. A significant earthquake, as defined by NGDC, is one that has caused at least moderate damage (approximately $1 million or more), has resulted in 10 or more deaths, has registered as a magnitude 7.5 or greater, has registered as Modified Mercalli Intensity (MMI) Scale X or greater, or generated a tsunami. None of these criteria have been met by any seismic activity known to have impacted the Bastrop County Planning Area, including all participating jurisdictions, ISDs and special districts.

PROBABILITY OF FUTURE EVENTS

Earthquake Hazard Maps show the distribution of earthquake shaking levels that have a certain probability of occurring over a given period. According to the USGS, the entire Bastrop County Planning Area has a PGA of 0-8%g for earthquakes with a 4-percent probability of occurring within 50 years. Based on historical records, the probability of an earthquake affecting the Bastrop County Planning Area, including all participating jurisdictions, ISDs and special districts, is unlikely, meaning that an event is possible in the next ten years.

VULNERABILITY AND IMPACT

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

Table 16-5 includes the critical facilities that would be vulnerable to Earthquake events in each participating jurisdiction:

Table 16-5. Critical Facilities by Jurisdiction

JURISDICTION	CRITICAL FACILITIES
Bastrop County	1 Animal Shelter, 2 Cancer Research Facilities, 7 Communications Facilities, 1 County 911 Dispatch Facility, 8 Government Facilities, 1 Detention Facility, 4 Educational Facilities, 3 Electric Cooperative Facilities, 1 EOC, 1 Emergency Services Facility, 1 Prison Facility, 13 Fire Station Facilities, 1 Gas Storage Facility, 2 Hazardous Material Facilities, 4 Vulnerable Population Residential Facilities, 4 Emergency Medical Facilities, 1 Military Training Facility, 1 Pipeline Transportation Facility, 1 Power Distribution Facility, 2 Power Generation Facilities, 2 Propane Distribution Facilities, 1 Rail Yard Facility, 4 Government Storage Facilities, 1 School Bus Transport Facility, 1 Sheriff's Office, 2 DOT Program Facilities, 1 Wastewater Treatment Plant, 2 Water Facilities
City of Bastrop	2 Bridges, 1 Government Facility, 2 Communications Facility, 1 Corrections Facility, 6 Educational Facilities, 2 Electric Substations, 1 Emergency Shelter, 2 Fire Station Facilities, 2 Emergency Medical Facilities, 2 Police Station Facilities (including 911 Center), 1 Government Storage Facility, 19 Wastewater Lift Stations, 2 Wastewater Treatment Facilities, 12 Water Well Facilities
City of Elgin	1 Emergency Evacuation Center, 1 Helicopter Landing Pad, 1 Emergency Medical Facility, 1 Police Station, 1 Fire Station, 1 Water Treatment Facility
City of Smithville	1 Government Facility, 1 Government Storage Facility, 2 Chemical Storage Facilities, 1 Communications Facility, 1 Emergency Shelter, 2 Fire Stations, 1 Municipal Airport, 1 Police Station, 3 Pump Stations, 2 Wastewater Chemical Facilities, 4 Wastewater Treatment Facilities, 1 Water System Facility, 6 Water Storage Facilities, 3 Water Well Facilities
Bastrop ISD	14 School Campus Locations (All facilities including schools, administration facilities, maintenance and operations facilities, service center, stadium, technology building, and transportation facility)
Elgin ISD	7 School Campus Locations (All facilities including schools, administration facilities, development center, maintenance and operations, nutrition services facility, technology building, and transportation facility)
McDade ISD	4 School Campus Locations (All facilities including schools, administration facilities, AG shop facility, band hall, maintenance and operations, nutrition services facility, technology building, and transportation facility)

SECTION 16: EARTHQUAKE

JURISDICTION	CRITICAL FACILITIES
Smithville ISD	4 School Campus Locations (All facilities including schools, administration facilities, and maintenance and operations facilities)
Bastrop County MUD #1	11 Services Office, 1 Operations Center, 1 Operations and Maintenance Firm, 1 Wastewater Plant, 1 Water Plant, 1 Water Facility, All Pipeline Infrastructure
Bastrop County WCID#2	1 Water Well and Pumping Station, All Pipeline Infrastructure
Bastrop County WCID#3	None

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

SECTION 17: EXPANSIVE SOILS

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HAZARD DESCRIPTION

Expansive soils are soils and soft rocks with a relatively high percentage of clay minerals that are subject to changes in volume as they swell and shrink with changing moisture conditions. Drought conditions can cause soils to contract in response to a loss of soil moisture.



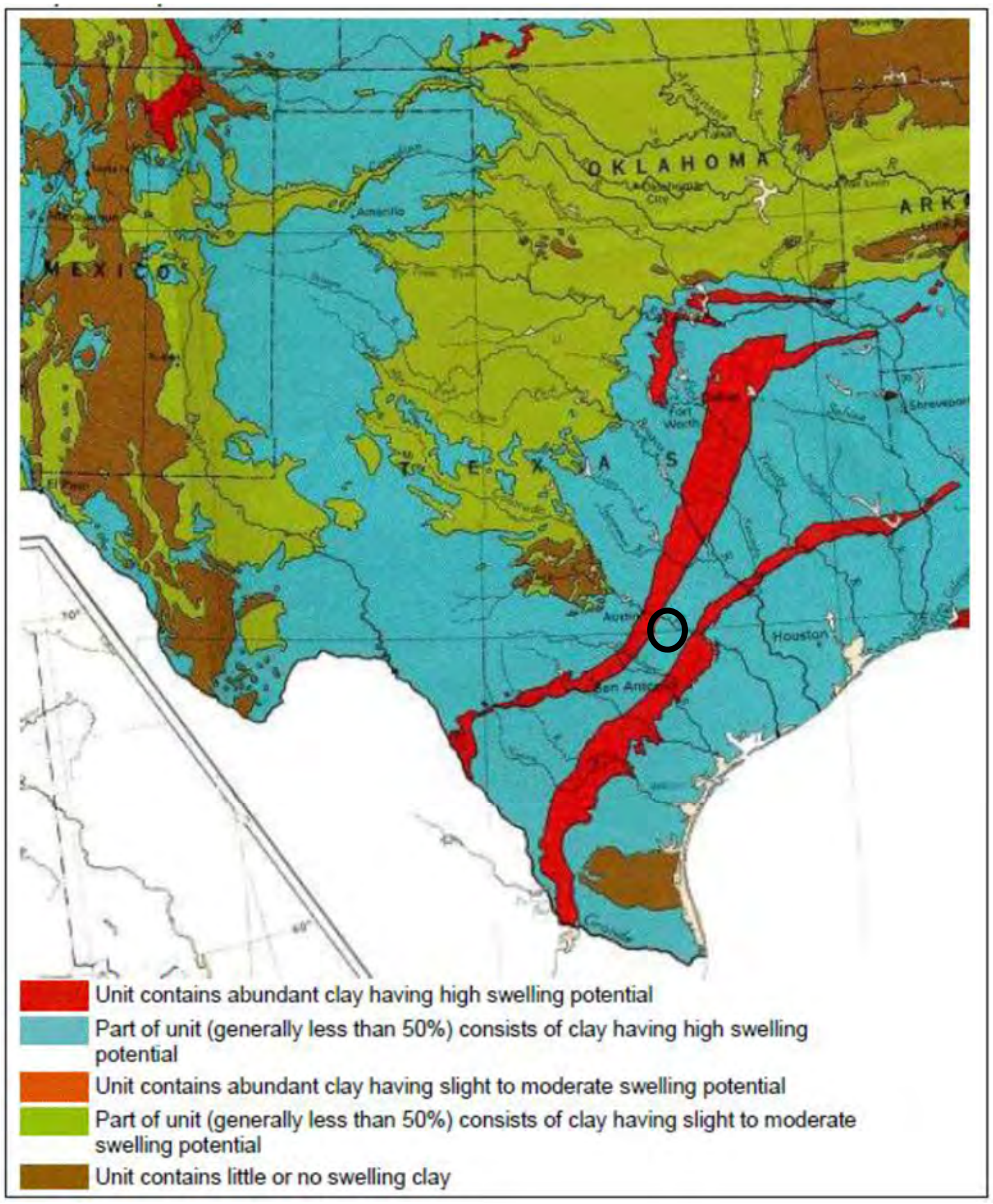
Expansive soils contain minerals such as smectite clays that are capable of absorbing water. When these clays absorb water they increase in volume and expand. Expansions in soil of 10 percent or more are not uncommon in the Bastrop County planning area. The change in soil volume and resulting expansion can exert enough force on a building or other structure to cause damage.

Expansive soils will also lose volume and shrink when they dry. A reduction in soil volume can affect the support to buildings or other structures and result in damage. Fissures in the soil can also develop and facilitate the deep penetration of water when moist conditions or runoff occurs. This produces a cycle of shrinkage and swelling that places repetitive stress on structures.

LOCATION

Bastrop County, including all participating jurisdictions, ISDs, and special districts, may be affected by some degree of expansive soils. Figure 17-1 depicts expansive soils across the State of Texas and the Bastrop County planning area is identified within the black circle. These areas receive the most moisture and are also vulnerable to droughts, which can cause the soils to expand and contract. Figure 17-2 depicts the types of land resources in the State of Texas due to their soil types.

Figure 17-1. Texas Geological Survey[1]



[1] Source: United States Geological Survey, http://www.usgs.gov

Figure 17-2. Texas Geological Survey[2]



The Bastrop County planning area, including all participating jurisdictions, ISDs, and special districts, is located within the Blackland Prairie and the Post Oak/Claypan Area, as identified within the black circle in Figure 17-2. The entire planning area is located in an area affected by moderate to high expansive soils.

Blackland Prairie: The Blackland Prairies consist of about 12.6 million acres of east-central Texas, extending southwesterly from the Red River to Bexar County. There are smaller areas to the southeast. The landscape is undulating with few scattered wooded areas that are mostly in the bottomlands. Surface drainage is moderate to rapid.

Both upland and bottomland soils are deep, dark-gray to black, and consist of alkaline clays. Some soils in the western part are shallow to moderately deep over chalk. Soils on the eastern edge are typically neutral to slightly acidic, grayish clays and loams over mottled clay subsoils (sometimes called graylands). Blackland soils are known as “cracking clays” because of their

[2] Source: USDA, http://www.nrcs.usda.gov

high shrink-swell property and the large, deep cracks that form in dry weather. This high shrink-swell property can cause serious damage to foundations, highways, and other structures, and is a safety hazard in pits and trenches.

Land use is almost equally cropland and grassland. Cotton, grain sorghums, corn, wheat, oats, and hay are grown in this area. Grassland is mostly improved pastures, with native range on the shallower and steeper soils. Water erosion, cotton root rot, soil tilth, and brush control are the major management problems.

Post Oak/Claypan Area: The Claypan Area consists of about 6.1 million acres in east-central Texas just east of the Blackland Prairie. The landscape is a gently undulating to rolling, moderately dissected woodland also known as the Post Oak Belt or Post Oak Savannah. Surface drainage is moderate. Upland soils commonly have a thin, light-colored, acid sandy loam surface layer over dense, mottled red, yellow, and gray claypan subsoils. Some deep, sandy soils with less clayey subsoils exist. Bottomlands are deep, highly fertile, reddish-brown to dark-gray loamy to clayey soils. Land use is mainly rangeland. Some areas are in improved pastures. Most cropland is in bottomlands that are protected from flooding. Major crops are cotton, grain sorghums, corn, hay, and forage crops, most of which are irrigated. Brush control on rangeland and irrigation water management on cropland are the major soil-management problems. Water erosion is a serious problem on the highly erosive claypan soils, especially where they are overgrazed.

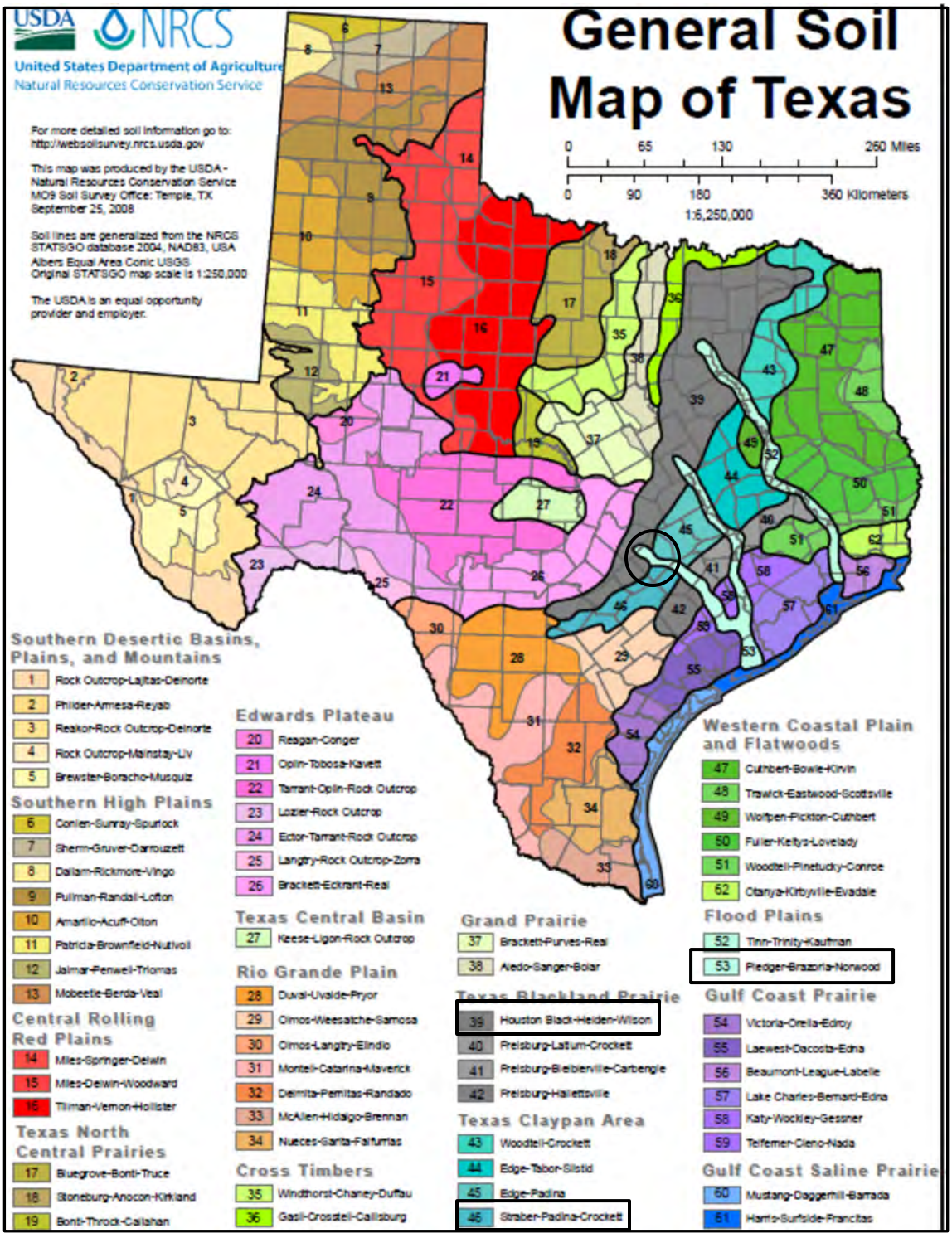
While the majority of the Bastrop County planning area is located in the Post Oak/Claypan Area, a small portion of the county along the northwest border is located in the Blackland Prairie.

EXTENT

The extent to which soil expansion is present in an area can be determined using the predominant soil composition and associated permeability. The soil survey was developed by the USDA Soils Conservation Service and contains information that can be applied in determining the suitability of soils in the planning area when selecting sites for roads, structures, and infrastructure.[3] Figure 17-3 shows the predominant soil types throughout the state of Texas and the planning area.

[3] Source: United States Department of Agriculture Soil Conservation Service

Figure 17-3. USDA General Soil Map of Texas



The grey area marked as #39 indicates predominant soils including Houston Black, Heiden, and Wilson. The teal area marked as #46 indicates predominant soils including Straber, Padina, and Crockett. The seafoam green area marked as #53 indicates predominant soils include Pledger, Brazoria and Norwood. The Bastrop County Soil Survey provides a description of these

predominant soils along with the plasticity index of each. Higher plasticity index soils exhibit greater sensitivity to drought conditions. The shrinking and swelling causes significant problems with foundations, roadways, sidewalks and other structures and infrastructure. Table 17-1 includes the plasticity index value ranges and soil properties while Table 17-2 includes additional descriptions of the soil types predominant throughout the planning area with the assigned plasticity index per soil type by area as identified in Figure 17-3. The predominant soil types for each area can vary greatly from one plat to the next.

The Plasticity Index is provided for each type of soil within the planning area. However, without a detailed soil survey map of the area, it is not possible to differentiate the plasticity index from one jurisdiction to the next. The plasticity index ranges are provided on a county-wide basis for each predominant soil type. This data deficiency is addressed in the mitigation actions in Section 24 of this plan. The plasticity index for each soil type as well as the descriptions provided in the tables below represent a summary of the data provided in the USDA Soil Survey of Bastrop County.[4]

Table 17-1. Value and Plasticity Index of Soils

PLASTICITY INDEX	SWELLING POTENTIAL
0-18	Low
18-22	Medium
22-35	High
>35	Very High

Table 17-2. Bastrop County Soil Description by Area and Plasticity Index of Soils

AREA	SOILS	DESCRIPTION	PLASTICITY INDEX	POTENTIAL EXPANSION/EXTENT LEVEL
39	Houston Black-Heiden-Wilson	Houston Black series soil consists of very deep, moderately well drained, very slowly permeable soil. These nearly level to moderately sloping soils occur on interfluves and side slopes on upland This predominant soil type is typically suitable for crops. Heiden series soil consists of deep and very deep to mudstone, well drained, very slowly permeable soils. These nearly level to moderately steep soils occur on foot slopes of	11-20; 25-37; 24-40	Low, Medium, High, Very High

[4] USDA Soil Survey of Bastrop County, 1978, website: https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/texas/TX021/0/bastrop.pdf

AREA	SOILS	DESCRIPTION	PLASTICITY INDEX	POTENTIAL EXPANSION/EXTENT LEVEL
		base slopes, shoulders of interfluves, and backslopes of side slopes of ridges on dissected plains. This predominant soil type is typically suitable for livestock grazing and hay production. Wilson series soil consists of very deep, moderately well drained, very slowly permeable soils. These nearly level to gently sloping soils are on treads of Pleistocene stream terraces. This predominant soil type is typically suitable for crops.		
46	Straber-Padina-Crockett	Straber series soil consists of very deep, moderately well drained, very slowly permeable soils that formed in calcareous loamy and clayey residuum derived from mudstone of the Willis Formation. They are somewhat poorly drained and permeability is very slow. A water table exists for a few days to several weeks during September to May. This predominant soil type is typically suitable for rangeland. Padina series soils consists of very deep, well drained, moderately permeable soils that formed in sandy residuum derived from sandstone. They are well drained, and permeability is moderate. These nearly level to moderately steep sloping soils are on broad ridges on inland dissected coastal plains. This predominant soil type is typically suitable mainly as brushy rangeland and used for grazing. Crockett series soils consists of soils that are deep to weathered shale of Cretaceous age. They are moderately well drained,	3-12; 28-45; 15-45	Low, Medium, High, Very High

AREA	SOILS	DESCRIPTION	PLASTICITY INDEX	POTENTIAL EXPANSION/EXTENT LEVEL
		and very slowly permeable. These soils are on broad ridges on the dissected plains. These nearly level to moderately sloping soils formed in alkaline residuum derived from interbedded shale and clay. This predominant soil type is typically suitable for crops.		
53	Pledger, Brazoria and Norwood	Pledger series soils consists of very deep, moderately well drained, very slowly permeable soils that formed in clayey alluvium. These nearly level soils are on flood plains. This predominant soil type is typically suitable for cropland or wildlife habitat. Brazoria series soils consists of very deep, moderately well drained, very slowly permeable soils formed in clayey alluvial sediments on the flood plains of the Brazos and Colorado Rivers. These gently to moderate sloping soils occur on flood plains of the Coastal Plains. This predominant soil type is typically suitable for cropland. Norwood series soils consists of very deep, well drained, moderately permeable soils on flood plains. This predominant soil type is typically suitable for cropland.	35-38; 47-52; 5-7	

High plasticity soils are prone to shrink and swell as soil moisture changes, which can degrade pavement, causing longitudinal cracking and edge drop-off. This effect can damage foundations of buildings and homes. The Bastrop County planning area is subject to a range of plasticity Index levels including low, medium, high, and very high, as indicated by the soils in Figure 17-3, and Tables 17-1 and 17-2 above. Plasticity of soils are highly subject to location and soil moisture content in any given time frame and location. Due to the broad plasticity index range throughout the Bastrop County planning area, including all participating jurisdictions, ISDs, and special districts, the worst the entire planning area may anticipate is very high swelling potential.

SECTION 17: EXPANSIVE SOILS

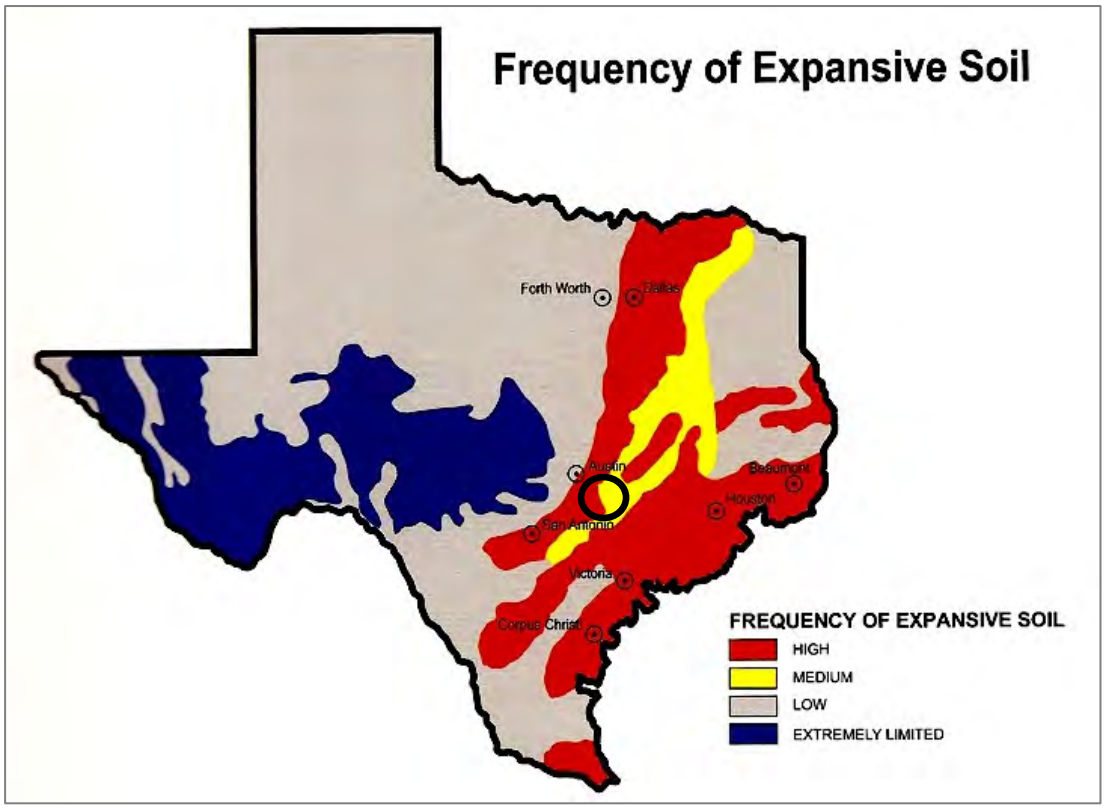
HISTORICAL OCCURRENCES

Expansive soil 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. Extreme conditions can damage roads, structures, and infrastructure, including projects still under construction. Damages from expansive soils are typically associated with droughts. The Elgin ISD and Bastrop County MUD #1 both report minor damages resulting from expansive soils. No other participating jurisdiction, ISD, or special district have any reported expansive soil events. However, expansive soils have been observed throughout the planning area. The limited reported data for historical expansive soil incidents is noted as a data deficiency for this planning cycle. An action has been created to enhance data collection for expansive soil incidents in future plan updates.

PROBABILITY OF FUTURE EVENTS

Since no records of specific incidences of loss associated with expansive soils were found, and no specific occurrences of expansive soils were identified within the planning area, the probability of future events cannot be determined at this time. However, according to public opinion, team input, and soil conditions, the probability of future events of loss due to expansive soils within the planning area, is highly likely, especially when drought cycles increase throughout the planning area. The Bastrop County planning area, including all participating jurisdictions, ISDs, and special districts, is shown in the black circle and is subject to a range of frequency of expansive soils, with a maximum “high” frequency. Therefore, the probability of expansive soil events with potential damages is considered highly likely, with an event likely every year.

Figure 17-4. Frequency of Expansive Soils



VULNERABILITY AND IMPACT



The effects of expansive soils are most prevalent when periods of moderate to high precipitation are followed by drought and then again by periods of rainfall. Other cases of damage result from increases in moisture volume from such sources as broken or leaking water and sewer lines. Dry clays are capable of absorbing water and will increase in volume in an amount proportional to the amount of water absorbed. Soils capable of changes in volume present a hazard to structures built over them and to the pipelines buried in them. Houses and one-story commercial buildings are more apt to be damaged by the expansion of swelling clays than are multi-story buildings, which are usually heavy enough to counter swelling pressures. However, if constructed on wet clay, multi-story buildings may also be damaged by clay shrinkage when moisture levels are substantially reduced.

Cracked foundations and floors, jammed windows and doors, and ruptured pipelines are typical types of damage resulting from swelling soils. Damage to the upper floors of larger buildings can occur when motion in the structure is significant. While all infrastructure within the Bastrop County planning area, including all participating jurisdictions, ISDs, and special districts, is vulnerable, slab on grade structures are more likely to suffer damages from expansive soils. In addition, older structures built to less stringent building codes may also be more susceptible to damages than new construction.

While the number of slab on grade structures is not available, the U.S. Census data indicates approximately 7,612[5] of the residential structures in the planning area were built before 1980 (Table 17-3) and may be more susceptible to damages.

Table 17-3. Structures at Greater Risk by Jurisdiction

JURISDICTION	SFR STRUCTURES BUILT BEFORE 1980
Bastrop County	7,612
City of Bastrop	950
City of Elgin	1,407
City of Smithville	1,227
Bastrop ISD	-
Elgin ISD	-
McDade ISD	-

[5] Structures under the county include all incorporated and unincorporated areas of the county and includes all participating jurisdictions, ISDs, and special districts.

Smithville ISD	-
Bastrop County MUD #1	3
Bastrop County WCID #2	1
Bastrop County WCID #3	0

The following critical facilities would be vulnerable to expansive soils in the planning area by jurisdiction.

Table 17-4. Critical Facilities by Jurisdiction

JURISDICTION	CRITICAL FACILITIES
Bastrop County	1 Animal Shelter, 2 Cancer Research Facilities, 7 Communications Facilities, 1 County 911 Dispatch Facility, 8 Government Facilities, 1 Detention Facility, 4 Educational Facilities, 3 Electric Cooperative Facilities, 1 EOC, 1 Emergency Services Facility, 1 Prison Facility, 13 Fire Station Facilities, 1 Gas Storage Facility, 2 Hazardous Material Facilities, 4 Vulnerable Population Residential Facilities, 4 Emergency Medical Facilities, 1 Military Training Facility, 1 Pipeline Transportation Facility, 1 Power Distribution Facility, 2 Power Generation Facilities, 2 Propane Distribution Facilities, 1 Rail Yard Facility, 4 Government Storage Facilities, 1 School Bus Transport Facility, 1 Sheriff's Office, 2 DOT Program Facilities, 1 Wastewater Treatment Plant, 2 Water Facilities
City of Bastrop	2 Bridges, 1 Government Facility, 2 Communications Facility, 1 Corrections Facility, 6 Educational Facilities, 2 Electric Substations, 1 Emergency Shelter, 2 Fire Station Facilities, 2 Emergency Medical Facilities, 2 Police Station Facilities (including 911 Center), 1 Government Storage Facility, 19 Wastewater Lift Stations, 2 Wastewater Treatment Facilities, 12 Water Well Facilities
City of Elgin	1 Emergency Evacuation Center, 1 Helicopter Landing Pad, 1 Emergency Medical Facility, 1 Police Station, 1 Fire Station, 1 Water Treatment Facility
City of Smithville	1 Government Facility, 1 Government Storage Facility, 2 Chemical Storage Facilities, 1 Communications Facility, 1 Emergency Shelter, 2 Fire Stations, 1 Municipal Airport, 1 Police Station, 3 Pump Stations, 2 Wastewater Chemical Facilities, 4 Wastewater Treatment Facilities, 1 Water System Facility, 6 Water Storage Facilities, 3 Water Well Facilities
Bastrop ISD	14 School Campus Locations (All facilities including schools, administration facilities, maintenance and operations facilities,

JURISDICTION	CRITICAL FACILITIES
	service center, stadium, technology building, and transportation facility)
Elgin ISD	7 School Campus Locations (All facilities including schools, administration facilities, development center, maintenance and operations, nutrition services facility, technology building, and transportation facility)
McDade ISD	4 School Campus Locations (All facilities including schools, administration facilities, AG shop facility, band hall, maintenance and operations, nutrition services facility, technology building, and transportation facility)
Smithville ISD	4 School Campus Locations (All facilities including schools, administration facilities, and maintenance and operations facilities)
Bastrop County MUD #1	11 Services Office, 1 Operations Center, 1 Operations and Maintenance Firm, 1 Wastewater Plant, 1 Water Plant, 1 Water Facility, All Pipeline Infrastructure
Bastrop County WCID#2	1 Water Well and Pumping Station, All Pipeline Infrastructure
Bastrop County WCID#3	None

The impact of expansive soils ranges from cosmetic cracks in walls to substantial foundation and structural damage that can result in a need for building demolition. Infrastructure such as pipelines can be damaged, causing increased maintenance and repairs, replacement, or damage to the point of failure. Sewer and water lines are also affected by shrink and swell soils. The movement of the soils can snap water and sewer lines, producing a minimum of temporary discomfort, and a maximum of a serious health and welfare risk.

Homeowners and public agencies that assume they cannot afford preventative measures such as more costly foundations and floor systems, often incur the largest percentage of damage and costly repairs from expanding soil. No figures are available for the total damage to homes in the planning area from expansive clays. In the Bastrop planning area, including all participating jurisdictions, ISDs, and special districts, the most extensive damage from expansive soils can occur to bridges, highways, streets, infrastructure, and parking lots. The greatest damage occurs when structures are constructed when clays are dry (such as during a drought) and then subsequent soaking rains swell the clay.

The impact of expansive soils experienced in the Bastrop County planning area has resulted in no injuries and fatalities, supporting a limited severity of impact meaning injuries and/or illnesses are treatable with first aid, shutdown of facilities and services for 24 hours or less, and less than 10 percent of property is destroyed or with major damage.

SECTION 18: INFECTIOUS DISEASE

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HAZARD DESCRIPTION

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

There are three classifications of disease impacts: endemic, epidemic, and pandemic. An endemic is always present at a low frequency, such as chicken pox in the United States. An epidemic is a sudden severe outbreak of disease, such as the bubonic plague during Medieval Times. A pandemic is an epidemic that becomes very widespread and affects a whole region, a continent, or the world, for example the 1957 flu pandemic caused at least 70,000 deaths in the United States and one to two million deaths worldwide. In recent years, fears of pandemic have risen because the globalized economy and growing population fosters large scale international travel and trade. Growing populations increase the vulnerability of all areas to disease because a denser population increases the risk of exposure to an infectious disease and advances the spread of infection.

The top 10 infectious diseases according to the World Health Organization (WHO) based upon number of deaths are presented in Table 18-1.

Table 18-1. Worldwide Mortality Due to Infectious Disease[1]

RANK	CAUSE OF DEATH	APPROXIMATE WORLDWIDE DEATHS IN 2018
1	Lower Respiratory Infections	4.4 million
2	Diarrheal diseases	3.1 million
3	Tuberculosis (TB)	3.1 million
4	Malaria	2.1 million
5	Hepatitis B	1.1 million
6	HIV/AIDS	1.0 million
7	Measles	1.0 million
8	Tetanus	160,000
9	Whooping Cough	355,000
10	Intestinal Worm Disease	135,000

While all of these diseases are monitored by Bastrop County on a regular basis, the primary disease of concern at the time of this planning process was the Coronavirus disease (COVID-19) due to its rapid spread and impact on the global economy.

Coronavirus disease (COVID-19) is an infectious disease caused by a recently discovered new strain of coronavirus. Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment. Older people, and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness.

The COVID-19 virus spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes, so it's important that you also practice respiratory etiquette (for example, by coughing into a flexed elbow). Many months into the COVID-19 pandemic, the coronavirus is still spreading uncontrolled through the country and throughout the world. Public health authorities including the U.S. Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO) recommend citizens to remain six feet apart, wash hands frequently, disinfect frequently touched surfaces, and wear masks. There is a growing school of evidence that COVID-19 cases are transmitted through aerosols (sometimes referred to as airborne).

Approximately twelve months prior to drafting of this plan, three vaccines for COVID-19 were approved by the Food and Drug Administration (FDA). To date more than 58% of Texans have been fully vaccinated against the virus. Similar to communities around the globe, Bastrop County

[1] Source: World Health Organization

has been dramatically impacted by this virus with 16,476 confirmed cases and 239 related deaths.[2] The economic impact of the virus has been devastating for the planning area. The planning area continues to slowly recover from the effects of the pandemic but, economic recovery is likely to take years. The COVID-19 infection was declared a pandemic by the World Health Organization on March 11, 2020.

The CDC contains the latest information and guidance on the COVID-19 pandemic and provides recommendations on protecting citizens and reducing the spread of the disease

LOCATION

Pandemics are random and only a few happen every century. The impacts from an infectious disease event can affect all areas of the world, therefore all areas are vulnerable, as evidenced by the current COVID-19 pandemic. Since air travel and worldwide shipping have increased, it has become increasingly difficult to contain localized outbreaks as infected or exposed people travel across the globe in a matter of hours. Third world countries have fewer resources to fight disease and may be more vulnerable than more industrialized nations. In the United States, the U.S. public health system works at the federal, state and local level to monitor diseases, plan and prepare for outbreaks, and prevent epidemics where possible.

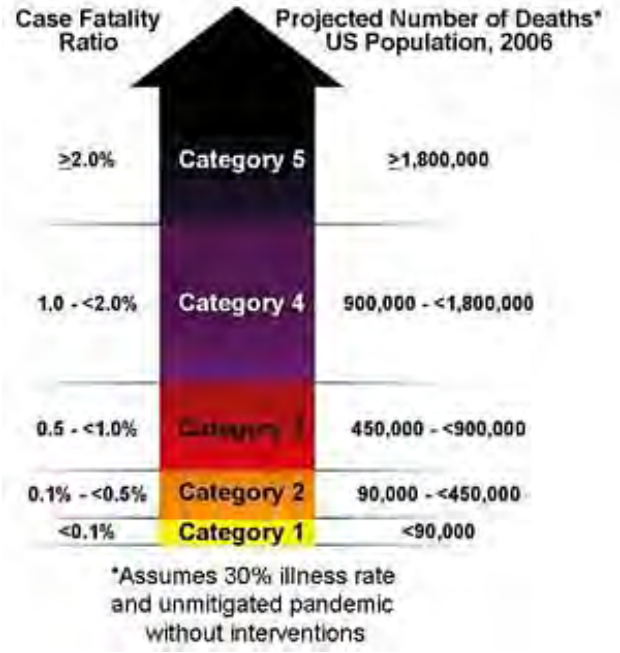
There is no distinct geographic boundary to infectious disease, therefore, it can occur throughout the Bastrop County planning area.

EXTENT

The severity of a pandemic virus can be evaluated from the perspective of the individual who has been infected; or from the population level, how many complications and deaths might be expected as a whole. The most common measure of severity for a pandemic virus event is the case-fatality rate (CFR) as depicted in Figure 18-1.

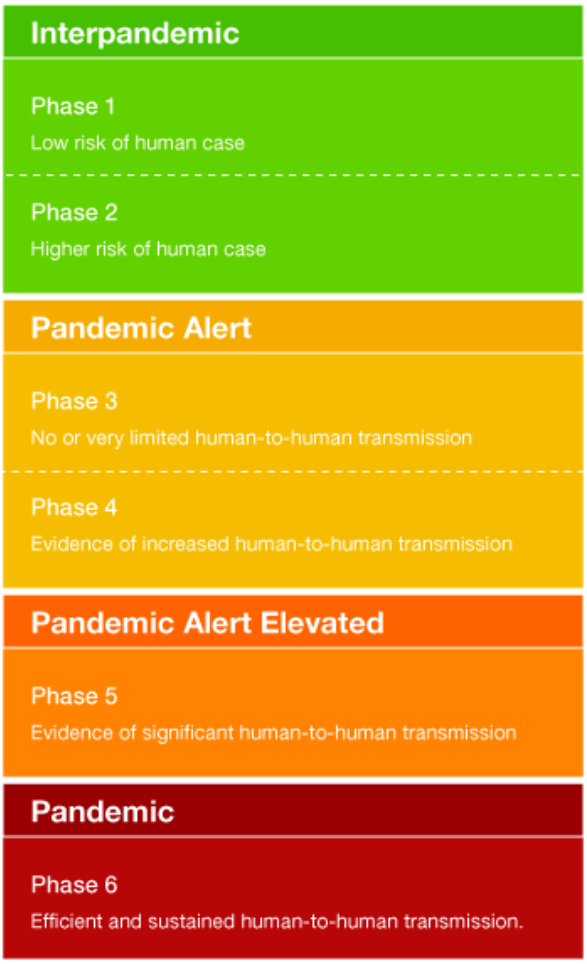
[2] The number of confirmed cases and related deaths from COVID-19 as of May 2022. https://usafacts.org/visualizations/coronavirus-covid-19-spread-map/state/texas/county/bastrop-county?utm_source=google&utm_medium=cpc&utm_campaign=ND-COVID&gclid=Cj0KCQiAubmPBhCyARIsAJWNpiMucSnRzN65H6nBbcIwbRTFERzSjUgyfVHGB4ELdomY7LWC4IIXDfQaAha8EALw_wcB

Figure 18-1. Case-Fatality Rate for Severity



The magnitude of a pandemic event is identified in terms of warning levels based on population. Figure 18-2 illustrates the various warning levels for pandemic. The current COVID-19 pandemic warning level is at Phase 6.

Figure 18-2. Risk levels for Pandemic (World Health Organization)



HISTORICAL OCCURRENCES

Occurrences of a biological event hazard are fairly common. Historically, there have been a number of *E. coli* and similar outbreaks traced to issues or deficiencies in the nation's food supply. In Texas, there have been several occurrences of biological hazards, as reported by the Center for Disease Control (CDC). From 2011 to 2015, the average number of E. coli outbreaks in Texas was 563 cases per year. In 2017, there was the largest mumps outbreak with 470 cases in Texas since 1990.

In March of 2009, a novel strain of Influenza A (H1N1 or "Swine Flu") virus was detected in Mexico and the United States. The virus spread worldwide. Final infection estimates were published in 2011. These final estimates were that from April 12, 2009 to April 10, 2010 approximately 60.8 million cases, 274,304 hospitalizations, and 12,469 deaths occurred in the United States due to H1N1[3]. The most commonly reported symptoms include cough, fever, sore throat, and

[3] SDS website: https://www.cdc.gov/h1n1flu/estimates_2009_h1n1.htm

gastrointestinal symptoms, such as vomiting and diarrhea. Most individuals infected with H1N1 did not require hospitalization and had symptoms that lasted four days.[4]

COVID-19 is the disease caused by a new strain of coronavirus called SARS-CoV-2. The World Health Organization (WHO) first learned of this new virus on December 31, 2019, following a report of a cluster of cases of 'viral pneumonia' in Wuhan, People's Republic of China. The virus quickly spread worldwide in the early spring of 2020. Since the early spring of 2020, 16,476 number of COVID-19 cases have been reported for the planning area with 239 associated fatalities.[5] The disease has been associated with a long list of potential symptoms, the worst of which are significant respiratory issues that can lead to death. Most individuals infected with COVID-19 did not require hospitalization. While the length of symptoms is still being studied, most patients experience symptoms for a few days to one week but can be infections for up to fourteen days, even after symptoms have subsided.[6]

PROBABILITY OF FUTURE EVENTS

Epidemics and pandemics have occurred in human and animal populations for thousands of years. As humans began to gather and congregate in urban areas, the potential for pandemics and epidemics increased. As trade routes became established and contact with other cities became more frequent, the potential for transmission of illnesses increased. In modern society, the ease of global travel has created a situation where viruses and bacteria can spread quickly from one continent to another.

Historical evidence shows that the population of the Bastrop County planning area is vulnerable to disease outbreak, and the probability of future infectious disease or pandemic events is possible. Local public health officials maintain surveillance in hopes of identifying disease prominence and containing potential threats before they become epidemics. Of concern is the reduction and treatment of COVID-19.

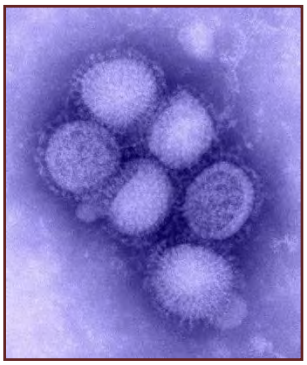
With the current COVID-19 pandemic, the probability of an infectious disease epidemic or pandemic in the Bastrop County planning area is unlikely and an event has the probability of occurring once every ten years or more. At the time this plan was being developed, the Bastrop County planning area was still suffering the impacts of the 2020 World Pandemic of COVID-19.

VULNERABILITY AND IMPACT

Estimated potential losses to the built environment are difficult to calculate because infectious disease causes little damage to the built environment and generally losses are experienced through public health response and medical costs, and lost wages of patients. Therefore, it is assumed that all buildings and facilities are exposed to disease but would experience negligible damage in the occurrence of an outbreak event. For example, upkeep and maintenance of buildings and facilities would fall behind due to the high absenteeism of employees or the closing of facilities.

[4] Carrat, F. et al. Timelines of Infection and Disease in Human Influenza: A Review of Volunteer Challenge Studies. American Journal of Epidemiology, 2008, 167: 775–785.
[5] The number of confirmed cases and related deaths from COVID-19 as of March 23, 2021.
[6] University of Maryland Medical System: https://www.umms.org/coronavirus/what-to-know/treat-covid-at-home

SECTION 18: INFECTIOUS DISEASE



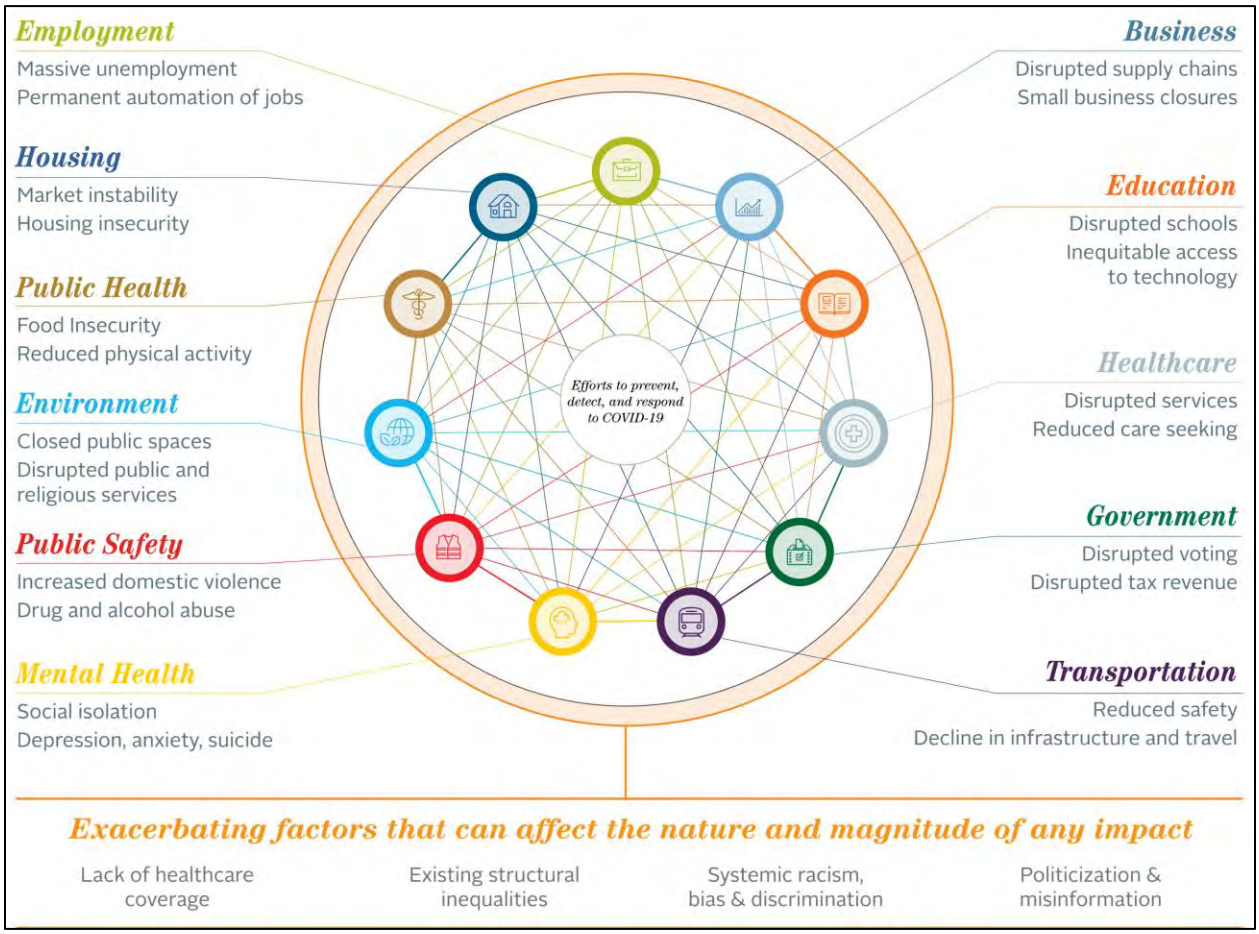
Critical infrastructure services, such as emergency services, utility services, water services and telecommunications can be limited by an infectious disease event. With the COVID-19 pandemic, most of the people affected have mild illness and do not require hospitalization. People at the highest risk for developing complications from COVID-19 include adults 60 years of age and older. In addition, people who have medical conditions, such as heart disease; chronic lung disease; blood, endocrine, kidney, liver or metabolic disorders; obesity, or a weakened immune system, can experience a worsening of existing conditions if they contract the COVID-19.

The current COVID-19 pandemic has demonstrated that the response costs to the public health sector for an outbreak, the economic impact, and the impact to health as a whole for the Bastrop County planning area, is “Substantial.” Multiple deaths can be expected, and the Bastrop County planning area facilities could be shut down for at least 4 weeks. Property damage could result from high absenteeism of persons responsible for property management.

The Bastrop County planning area executed a mandatory shutdown of non-essential businesses for three weeks as a direct result of COVID-19. The gradual re-opening of businesses and restaurants was completed in incremental stages to try and limit the spread of the infection and protect consumers while restarting the economy. Larger gatherings of people were limited to 50 and below and at times to 10 and below. Area school districts closed all campuses and implemented remote learning in the spring of 2020 and for the first weeks of the 2020-2021 school year. At the time of the drafting of this plan, in-person and remote learning was on-going with contract tracing for infected students.

The impacts of COVID-19, the mandatory shutdown, large gathering limits, ISD closures and pervasive unemployment have led to extensive secondary impacts. Figure 18-3 provides an overview of secondary impacts of COVID-19 in the United States.

Figure 18-3. Secondary Impacts of the COVID-19 Pandemic in the United States



ASSESSMENT OF IMPACTS

Pandemics impact larger than normal segments of the population, and few sectors of the population are left untouched by infectious disease, as evidenced by the current pandemic. The physical problems associated with the infectious disease may be short term or may lead to long-term physical maladies.

The impact of an infectious disease event will be measured by the number of fatalities, how the community is affected, and to what extent. If a large number of people get sick simultaneously, major social consequences will occur. Absenteeism in the workplace can have negative impacts on the overall functioning of society, particularly if it is prolonged.

The risks to public health and safety include first responders and others with increased exposure to the disease. Response personnel likely to experience the greatest impact would be those with medical responsibilities, such as fire fighters, ambulance workers, and clinic and hospital personnel. Response personnel could be in frequent contact with those who are either sick or infected and are prone to suffer proportionally higher impacts as a result.

Depending on the severity of the infectious disease event, there could be serious problems with continuity of operations and delivery of services. If county or city staff stay home due to illness, someone in their home is ill, or because they fear becoming ill, the ability of local government to maintain operations and deliver services could be seriously limited or compromised. A pandemic

illness that impacts county and city staff could have significant negative impacts, particularly for departments that do not have or exercise a Continuity of Operations Plan (COOP). Without a COOP that takes into account department-specific issues, or regular exercise of that COOP, critical departments may not be able to function and provide necessary services.

A pandemic event may result in heightened stress for responders, health care providers, public health workers, individuals, and communities. A vital part of pandemic planning is the development of strategies and tactics to address these potential problems. Psychological health resources should be provided to ensure that special populations are identified prior to the event and that unique service and transportation needs are incorporated into the local pandemic influenza emergency management plan. Stress management support to those who are symptomatic, those who believe they are ill, and to staff who are dealing with the increased workloads and personal concerns will be required. The public will require information on how to recognize and cope with the short- and long-term risks of sustained stress during mass vaccinations, for those debilitated by an illness, and their caregivers.

An infectious disease hazard affects living beings, therefore the vulnerability of property to an infectious disease event is minimal. Pandemics are unlikely to directly result in physical damage to the built environment. However, there is the possibility of indirect damage resulting from staff absenteeism and lack of routine operations and maintenance. Increased absenteeism of maintenance staff could result in reduced maintenance operations, which could negatively impact the operation of the system.

Human infectious diseases do not normally pose a risk to the natural environment. Infectious diseases tend to be specific to humans, and therefore pose little threat to the natural environment or non-mammalian species. However, certain exceptions exist including the avian flu, which can affect both birds and humans. It is possible that other pathogens may affect more than one species, but those pathogens would likely be limited to specific species.

Seasonal flu occurs annually and is estimated to cost the U.S. economy between $71 million and $167 million per year.[7] Severe pandemics have been predicted to cause more than $700 billion in economic losses, and to result in a 5.5% decrease in U.S. Gross Domestic Product (GDP).[8]

Major infectious disease events and pandemics can be expected to have larger and deeper impacts to the local and national economy. If the disease is slow-progressing, particularly long-lasting, or has long-term residual effects, the impact to the economy could be extended.

If the normal movement of the epidemic within society needs to be curtailed, a process known as “social distancing,” then a greater impact to the local economy could occur. Social distancing can be accomplished by a number of means; two ways of increasing social distance activity restrictions are to cancel events and close buildings or to restrict access to certain sites or buildings. These measures are sometimes called "focused measures to increase social distance."

Depending on the situation, examples of cancellations and building closures might include cancellation of public events, such as concerts, sports events, movies, plays; and closure of recreational facilities, such as community swimming pools, youth clubs, gymnasiums. While

[7] Source: World Health Organization

[8] Source: Federal Reserve Bank of St. Louis

necessary to limit the spread of the pathogen, facility closures could have economic ramifications.[9]

Infectious disease events are complicated hazards. Accurate information and clear, concise explanation during an infectious disease event are critical when conveying messages to the public. When a communication to the public fails, it can result in a loss of credibility, and can result in a loss of public confidence in leadership.

Infectious disease events can undermine the public's confidence in its government and leaders. Public dissatisfaction with government response will typically increase as the number of cases rise and public fear increases. Perceptions of inequality in medical care, particularly if those inequalities are based on socioeconomic status, ethnicity, age, gender, or seniority, can lead to increased dissatisfaction with government and leadership, and may result in a weakening of social order or hostility towards those in leadership or medical roles. Required rationing of supplies or vaccinations should be conscientiously carried out to avoid the appearance of bias or impropriety. Decisions regarding vaccinations, guidance, and treatment should be explained clearly and consistently to the public.

There could be significant public resistance to a decision to quarantine those who are ill or exposed, to restrict travel, or to implement social distancing. Any decision to restrict individual movement must be accompanied by a major public relations campaign to assure the public that these actions are necessary. If decisions are perceived by the public as necessary for their protection, the public is more likely to comply with official instruction.

[9] Source: GlobalSecurity.org

SECTION 19: CYBER-ATTACK

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HAZARD DESCRIPTION

A cyber-attack is any type of offensive maneuver employed by individuals or organizations that targets computer information systems, infrastructures, computer networks, and personal computer devices by various means of malicious acts. The malicious act usually originates from an anonymous source that either steals, alters, or destroys a specified target by hacking into a susceptible system.



Cyberspace and its underlying infrastructure are vulnerable to a wide range of risk including both physical and cyber threats and hazards. Sophisticated cyber actors and nation-states exploit vulnerabilities to steal information and money and can develop capabilities to disrupt, destroy, or threaten the delivery of essential services. Various crimes are perpetrated through cyberspace including the production and distribution of child pornography and child exploitation conspiracies, banking and financial fraud, intellectual property violations, and other crimes, all of which have substantial human and economic consequences.

Cyberspace is particularly difficult to secure from cyber-attack events, due to a number of factors including the ability of malicious actors to operate from anywhere in the world, the links between cyberspace and physical systems, and the difficulty of reducing vulnerabilities and consequences

in complex cyber networks. Of growing concern is the cyber threat to critical infrastructure, which is increasingly subject to sophisticated cyber intrusions that pose new risks. As information technology becomes increasingly integrated with physical infrastructure operations, there is increased risk for wide scale or high-consequence events that could cause harm or disrupt services upon which our economy and the daily lives of millions of Americans depend. In light of the risk and potential consequences of cyber events, strengthening the security and resilience of cyberspace has become an important homeland security mission.[1]

Bastrop County has enjoyed continued growth over the past decade. To address this growth, Bastrop County has become a leader in its use of computers, networks, and the data stored on them. The county takes steps to safeguard the integrity of its data and to prevent unauthorized access to information that is maintained in their computer systems. These measures are designed and intended to prevent corruption of data, block unauthorized access, and to ensure the integrity of information. This section reviews the hazards to the cybersecurity assets for the Bastrop County planning area.

HAZARDS

DENIAL OF SERVICE ATTACKS

A denial of service attack (DoS) is the attempt to make a computer or network resource unavailable to its intended users. A DoS attack may come from one or several computers, while a distributed denial of service attack (DDoS) will be launched from many, often thousands of computers. While a DoS attack may occur frequently and typically can be handled by the County's equipment, a DDoS attack can overload the Bastrop County's network or computer resources resulting in extended downtime. Often these attacks rely on lower level network vulnerabilities.

DATA LOSS/LEAKAGE

Data loss can result from a variety of reasons, both intentional and unintentional. Data loss may result from a failure to properly backup or have disaster recovery equipment and processes, employees improperly handling sensitive data, and criminal activities such as espionage, theft, sabotage, and other malicious acts.

INFRASTRUCTURE LOSS/FAILURE

Loss of computer and network resources may result from a variety of natural and human-caused disasters including tornadoes, hurricanes, and explosions due to accident, power loss, terrorism, and fire.

INSIDER THREATS

Insider threats are malicious threats to the planning area that comes from Bastrop County employees, contractors, and volunteers who have access to the County's computers, networks, and data. An insider can initiate a DoS attack, leak or steal data, and sabotage the infrastructure and data.

ORGANIZED CYBERCRIME, STATE-SPONSORED HACKERS ESPIONAGE

Organized cybercrime, which may include state-sponsored cybercrime, are attacks on the Bastrop County's computers, network, and data by criminal organizations. These criminals may be motivated by money or political reasons. Often these attacks are well planned out, difficult to identify due to their more limited scope, and can result in extensive damage.

[1] Source: Department of Homeland Security

THIRD PARTY MISMANAGEMENT

Reliance on third parties for cyber services implies acceptance of the risk that the third party will properly protect the cyber resources from loss or unavailability. Hazards from the use of third parties include DoS, DDoS, data loss and leakage, infrastructure loss and failure, insider threats, and organized cybercrime.

ADVANCE PERSISTENT THREATS

An advanced persistent threat (APT) is a stealthy and continuous attack on Bastrop County over a long period of time. The "advanced" process signifies sophisticated techniques using malware to exploit vulnerabilities in systems. The "persistent" process suggests that an external command and control system is continuously monitoring and extracting data from a specific target. The "threat" process indicates human involvement in orchestrating the attack.

CIVIL DISORDER

Civil disorder may impact the cybersecurity of the planning area by directly or indirectly impacting Bastrop County's ability to support its computers, networks, and data. Civil disorder can result in the planning area not having resources due to direct impact to the computers and networks, and indirectly by limiting the resources necessary to run the computers and networks.

LOCATION

Cyberwar is deceptive, invisible to most, and fought out of sight. It takes place in cyberspace, a location that cannot be seen, touched, or felt. The physical instruments, such as computers, routers, and cables can be seen; however, these instruments interact in cyberspace, a virtual and unseen realm. Thus, the source of the hazard can extend from one part of the world to attacks on public or private sector entities in another part of the world, and the perpetrator can remain unknown in a legally provable sense. The entire Bastrop County planning area, including all participating jurisdictions, can be affected by a cyber-attack.

EXTENT

Currently an official index for measuring the extent of a cyber-attack does not exist. The extent, nature, and timing of cyber-attack events are impossible to predict. There may or may not be any warning. Some cyber-attack events take a long time (weeks, months or years) to be discovered and identified.[2] Therefore, the Bastrop County planning area is vulnerable to all types of cyber-attack, and can occur anywhere, and at any time.

The extent of damages is based on historical incidents in the Bastrop County planning area are classified as low, medium, and high; third party information regarding the impact; and if the planning area has experienced an occurrence of the incident.

Denial of service attacks: Low

A DoS and DDoS attack could result in an extended cyber-outage in the planning area. The outage, although impacting the daily business of the planning area, would not have a substantial economic impact to the county.

[2] Source: http://www.ready.gov/cyber-attack

Data loss/leakage: High
Data loss and leakage experienced by the planning area could result in costly remediation efforts to ensue. For example, if personally identifiable information (PII) is leaked, the county may be required to pay for credit protection services. Since Bastrop County manages a large quantity of sensitive information, the possibility of costly remediation efforts is high.

Infrastructure loss/failure: High
Loss of a cyber-processing facility could result in very high expenses to remediate, repair, and recover from the loss.

Insider threats: Medium
Insider threats can result in substantial impacts to the organization, depending on what data the insider has accessed. Bastrop County has remediated insider threats by using the industry standard separation of duties, and performing background checks of its employees, contractors, and volunteers.

Organized cybercrime, state-sponsored hackers' espionage: High
The planning area is a moderate target for organized criminals and state-sponsored hackers due to its political environment and the size of the organization. Due to the potential extent of attacks by organized criminals, the possibility and severity of resulting damages are great.

Third party mismanagement: Low
Since each vendor is isolated to the service it performs, the damages from one third party's mismanagement is fairly low.

Advanced persistent threats: High
The impact of an APT to the planning area can be severe because a large number of systems can be affected and the remediation of such an attack could be expensive to recover from.

Civil disorder: High
The impacts of civil disorder on cybersecurity could be extensive due to the typical physical nature of the attacks.

HISTORICAL OCCURRENCES

USA Today reported that the electric grid is attacked every four days either physically or through cyber threats. The numbers of attacks are accelerating and becoming more sophisticated. The Texas Governor announced that websites belonging to state agencies have seen an increase in attempted cyber-attacks coming out of Iran (about 10,000 per minute) in the time since Iranian general Qassem Soleimani was killed in a U.S. drone strike.[3] While the attacks to gather data have not been successful, Bastrop County's technology security team remains on high alert. The Electric Reliability Council of Texas (ERCOT) reportedly has a team of professionals and a series of procedures they utilized to protect the planning area systems from cyber-attacks.

Even though cyber-attack events are virtually impossible to predict, the Bastrop County planning area has the potential of an occurrence happening at any time.

[3] Statesman News Network, January 2020, Website: https://www.statesman.com/news/20200110/austin-on-guard-after-texas-hit-with-increased-cyberattacks-from-iran

PROBABILITY OF FUTURE EVENTS

The probability of occurrence based on historical incidents in the planning area are classified as low, medium, and high; as well as third party information regarding the likelihood of incidents if the county has not had an occurrence of the incident.

Denial of service attacks: Low

The planning area has frequent DOS attacks which are not severe enough to cause impact to Bastrop County's service levels. Historically the county has had no DDoS attacks over the last year which successfully impacted services. Although there have been attempts for service disruptions through phishing emails, a fraudulent attempt to obtain sensitive information has not been successful. In the past, significant bad actors were identified by the U.S. Federal Government as Russia, Iran, and North Korea who historically attempt to disrupt or corrupt systems by damaging or gaining sensitive information through software. Bastrop County employs vendor software, which supports critical infrastructure. During the years of 2020 and 2021, the bad actors attempted to gain sensitive information continuously through vendor software. Although successful in some areas of the United States, Bastrop County was not affected.

Data loss/leakage: Low

The planning area is subject to several compliance requirements which specifically address data loss and leakage. These compliance standards include but are not limited to:

- Payment Card Industry Security Standard (PCI DSS)
- Health Insurance Portability and Accountability Act of 1996 (HIPAA)
- Criminal Justice Information Services Division (CJIS)

Historically, the county had no instances of data loss over the last year which resulted in the county having to remediate the situation.

Infrastructure loss/failure: Low

The planning area has multiple data centers which are hardened in various ways to minimize the possibility of outage. Resilience and redundancy are continuously being reviewed and addressed to reduce the risk of loss or failure. Additionally, many internal education and awareness campaigns are a part of critical infrastructure policy where members are tested internally by sending national phishing emails. The results of the test are made known internally for awareness as a prevention method. Historically, the infrastructure has had few outages that were extended. A prime example would be health care systems within the planning area.

Insider threats: Low

The planning area requires anyone who has access to Bastrop County's enterprise network and resources to have gone through a background check, which is regularly reviewed. There has never been evidence of insider attacks.

Organized cybercrime, state-sponsored hackers' espionage: Medium

Over the last five years Bastrop County had several instances of organized attack via DDoS and malware by an organization. Because Bastrop County is a large public entity, it is more prone to these types of attacks.

Third party mismanagement: Low

Bastrop County utilizes third parties for its cyber activities, and vets all contracts prior to final agreement. A county utilizes third parties for cyber training, cyber hygiene scanning, and for

external and internal testing. There has not been an instance of Third-party mismanagement to date.

Advanced persistent threats: Low
Bastrop County maintains systems which monitor symptoms of APT, and over the last five years there have been no instance of an infection by malware which had a command and control system.

Civil disorder: Low
Bastrop County has experienced civil disorder in the form of protests or large gatherings. National trends or urban developments in historical areas, makes Bastrop County subject to such events. The county, historically, has relatively low civil disorder events. Nationally, civil disorder events have been correlated or followed up by a cyber-attack to critical infrastructure. However, within the planning area, there have been no cyber-attacks tied into civil disturbance events in the past or within the last five years. Local, state and federal officials monitor such events and establish lines of communication in the event that a cyber incident may unfold. The probability to follow this national trend is low for the planning area.

Historical evidence shows that the Bastrop County planning area is vulnerable to a range of cyber treats, and the probability of future cyber-attacks is considered Highly Likely meaning an event is probable in the next year.

VULNERABILITY AND IMPACT



With the internet being largely open and unregulated, it leaves the planning area vulnerable to cyber-attacks and threats. The attack can be on information systems resulting in a data breach, or the spread of a virus. With the growing dependence on digital interconnectivity even a small incident may have widespread, and damaging consequences.

Transportation, public safety, and utility services are all critical, and highly dependent on information technology. The motive behind such disruptions can be driven by religious, political, other objectives.

A cyber-attack can last a few minutes to a couple of days, although large-scale events and their impacts can last much longer. Cyber-attacks differ by motive, type, vector, and perpetrator profile.

Cybersecurity involves protecting infrastructure by preventing, detecting, and responding to cyber-attack incidents. Unlike physical threats that prompt immediate action, such as “stop, drop, and roll,” in the event of a fire; cyber threats are often difficult to identify and comprehend. Among these dangers are viruses erasing entire systems, intruders breaking into systems and altering files, intruders using a computer or device to attack others, and intruders stealing confidential information. The spectrum of cyber-attack risks is limitless. Threats of cyber-attack can have wide-ranging effects on the individual, community, organizational, and national level. Risks from cyber-attack include:

- Organized cybercrime, state-sponsored hackers, and cyber espionage, which can pose national security risks to our country.
- Transportation, power, and other services may be disrupted by large scale cyber incidents, and the extent of the disruption is highly uncertain as it will be determined by many unknown factors including the target and size of the incident.
- Vulnerability to data breach and loss increases if an organization's network is compromised, and therefore information about a company, its employees, and its customers can be at risk.
- Individually owned devices such as computers, tablets, mobile phones, and gaming systems that connect to the Internet are vulnerable to intrusion, and therefore personal information may be at risk without proper security.[4]

Based on historical events, the potential impact of cyber-attacks for the entire Bastrop County planning area can be considered "Major" due to the critical facilities that can be indirectly impacted by an attack. While deaths, injuries or damages to the built environment are not directly impacted from a cyber-attack, the secondary or cascading affects of an attack could be devastating.

[4] Source: http://www.ready.gov/cyber-attack

SECTION 20: HAZARDOUS MATERIALS

Hazard Description 1
Location 2
Extent 4
Historical Occurrences 4
Probability of Future Events 5
Vulnerability and Impact 5
Assessment of Impacts 5

HAZARD DESCRIPTION

Hazardous materials come in the form of explosives, flammable and combustible substances, poisons, and radioactive materials. A hazardous material (HAZMAT) incident involves a substance outside normal safe containment in sufficient concentration to pose a threat to life, property, or the environment.

Chemicals are found everywhere. They purify drinking water, increase crop production, and simplify household chores. But chemicals also can be hazardous to humans or the environment if used or released improperly. Hazards can occur during production, storage, transportation, use, or disposal. You and your community are at risk if a chemical is used unsafely or released in harmful amounts into the environment where you live, work, or play.

In a hazardous materials incident, solid, liquid, and/or gaseous contaminants may be released from fixed or mobile containers. This profile focuses on fixed sites. Weather conditions will directly affect how the hazard develops.

The Toxics Release Inventory (TRI) is a publicly available database from the federal Environmental Protection Agency (EPA) which contains information on toxic chemical releases and other waste management activities that are reported annually by certain covered industry groups federal facilities. This inventory was established under the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) and expanded by the Pollution Prevention Act of 1990. Each year, facilities that meet certain activity thresholds must report their releases and other waste management activities for listed toxic chemicals to the EPA and their state or tribal entity. A facility must report if it meets the following three criteria:

- The facility falls within one of the following industrial categories: manufacturing; metal mining; coal mining; electric generating facilities that combust coal and/or oil; chemical wholesale distributors; petroleum terminals and bulk storage facilities; Resource Conservation and Recovery Act (RCRA) Subtitle C Treatment, Storage and Disposal (TSD) facilities; and solvent recovery services.
- Have ten or more full-time employee equivalents.
- Manufactures or processes more than 25,000 pounds or otherwise uses more than 10,000 pounds of any listed chemical during the calendar year. Persistent, Bio-accumulative and Toxic (PBT) chemicals are subject to different thresholds of ten pounds, 100 pounds or 0.1 grams depending on the chemical.

Tier II data is a publicly available database from the Texas Department of State Health Services Tier II Chemical Reporting Program. Under EPCRA, all facilities which store significant quantities of hazardous chemicals must share this information with state and local emergency responders and planners. Facilities in Texas share this information by filing annual hazardous chemical inventories with the Texas Department of State Health Services (DSHS), Local Emergency Planning Committees (LEPCs), and local fire departments. The Texas Tier II Report contains facility identification information and detailed chemical data about hazardous chemicals stored at the facility.

A facility must report if it meets the following criteria:

- Any company using chemicals that could present a physical or health hazard must report them, according to Tier II requirements.
- If an industry has an Occupational Safety and Health Administration (OSHA) deemed hazardous chemical that exceeds the appropriate threshold at a certain point in time, then the chemical must be reported. These chemicals may be on the list of 356 Extremely Hazardous Substances (EHS) or could be one of the 650,000 reportable hazardous substances (not on the EHS list). This reporting format is for a "snapshot in time." EHS chemicals have to be reported if the quantity is either greater than 500 pounds, or if the Threshold Planning Quantity (TPQ) amount is less than 500 pounds.

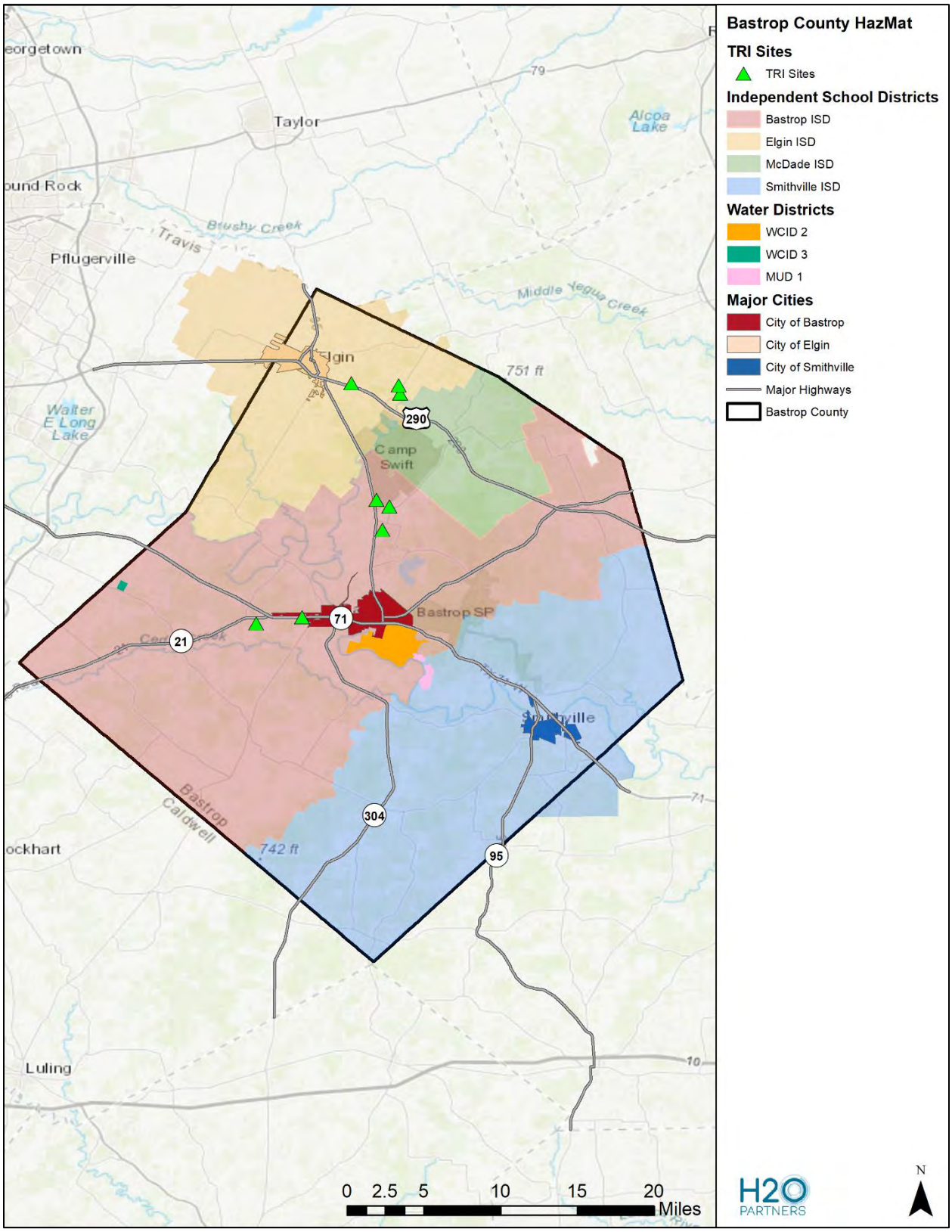
LOCATION

A hazardous material spill occurring along railroad tracks and major highways near population centers in the Bastrop County planning area is of concern to local emergency managers. Trains and trucks can carry a variety of materials that would, in large quantity, threaten the health and safety of people and the natural environment in the vicinity of a spill. In particular, State Route 95 and 71, which are generally paralleled by train tracks, is of concern, as are along US Route 290 or State Route21.

Under the Community Right-to-Know program laws upheld at the state and federal level, all facilities which store significant quantities of hazardous chemicals must share this information with state and local emergency responders and planners. Facilities in Texas share this information by filing annual hazardous chemical inventories with the state, with Local Emergency Planning Committees (LEPCs), and with local fire departments.

Figure 20-1 shows the locations of available georeferenced TRI and Tier 2 toxic sites in and around the Bastrop County planning area. Only toxic sites that have georeferenced data available were analyzed and the circle buffers are drawn around each hazardous material site.

Figure 20-1. Fixed HAZMAT Analysis Locations



EXTENT

The extent of a hazardous material release will depend on whether it is from a mobile or fixed site and the size of impact. The range of intensity will vary greatly depending on the circumstances. These factors and conditions include the material, toxicity, duration of the release, and environmental conditions such as the wind and precipitation.

Hazardous materials or toxic releases can have substantial impact on communities. Such events can cause multiple deaths, completely shut down facilities for 30 days or more, and cause more than 50 percent of affected properties to be destroyed or suffer major damage. In a hazardous materials incident, solid, liquid and/or gaseous contaminants may be released from fixed or mobile containers. Weather conditions would directly affect how the hazard develops. The micro-meteorological effects on buildings and terrain can alter travel patterns and duration of agents. Shielding in the form of permanent shelter can protect people from harmful effects. Non-compliance with fire and building codes, as well as failure to maintain existing fire and containment features can substantially increase damage from a hazardous materials release. The duration of a hazardous materials incident can range from hours to days. Warning time is minimal to none.

The spatial extent of a hazardous material release is minimal or expected to affect less than 10% of people or property.

HISTORICAL OCCURRENCES

Hazardous materials are substances which if released or misused can cause death, serious injury, long-lasting health effects, and damage to structure and other properties as well as to the environment. Many products containing hazardous chemicals are used and stored in homes routinely. These products are also shipped daily on the nation's highways, railroads, waterways, and pipelines.

A total of 16 transportation incidents have been reported in the Bastrop County planning area over the last 70 years. The data collected is from 1950 to 2020 and identifies the hazardous materials transportation incidents as in-transit, loading, and unloading of transport vehicles. The reported events with damages or fatalities are listed in Table 20-2 below.

Table 20-2. Hazardous Material Incident Events, Bastrop County

JURISDICTION	DATE	FATALITIES
Elgin	11/17/1993	0
Smithville	4/2/2000	0
Bastrop	2/19/2001	0
Elgin	1/6/2002	0
Sayers	4/20/2002	0
Bastrop	11/12/2005	0
Bastrop	3/19/2006	0
Smithville	11/25/2006	0

JURISDICTION	DATE	FATALITIES
Bastrop	9/28/2009	0
Elgin	3/18/2010	0
Bastrop	8/27/2010	0
Bastrop	10/4/2010	0
Garfield	4/7/2012	0
Smithville	3/3/2014	0
Smithville	4/4/2016	0
Elgin	5/31/2018	0
TOTAL LOSSES		**0**

PROBABILITY OF FUTURE EVENTS

Hazardous material spills are the result of human error and/or accidents, which cannot be predicted. However, given the amount of traffic through the planning area and the large population, the probability of a hazardous material spill is estimated by local officials to be probable in any given year. Nevertheless, most spills will not lead to negative health and safety impacts and will not cause substantial negative impacts on the air, soil, or groundwater. The probability of a spill threatening the health of thousands and of having long-term negative environmental consequences is, based on previous experience, estimated to be less than 1 percent in any given year.

Based on the historic incident records and team input, the frequency of occurrence for significant hazard material incidents is considered “Likely” and an event can be expected in the next three years for the Bastrop County planning area.

VULNERABILITY AND IMPACT

Based on the prevalence and geographic proximity of hazardous materials transportation routes and fixed locations, less than half of the Bastrop County planning area is vulnerable. The risk to the population depends on a variety of factors, including type and amount of chemical released, weather conditions, prevailing winds, time of day, and season. The environment is often vulnerable in a hazardous materials incident and can be heavily damaged by a hazardous materials incident.

Impact of hazardous materials incidents experienced in the Bastrop County planning area has resulted in no injuries or fatalities supporting a “Limited” severity of impact meaning injuries and/or illnesses are treatable with first aid, shutdown of facilities and services for 24 hours or less, and less than 10% of property is destroyed or with major damage.

ASSESSMENT OF IMPACTS

It is possible that a hazardous materials incident could involve a number of fatalities. It is likely that inhaled hazardous gasses may result in respiratory problems, including burning sensations

in the lungs, nose, and throat. Releases that involve solids or liquids can be absorbed through the skin and may cause burns on contact. In some instances, the threat to health and safety may not be evident for an extended period of time.

The particular transportation route and fixed site involved are significant factors in determining the risk to public health and safety and will determine the number of people in proximity to the hazard. Depending on the nature of the hazardous materials incident, the public could be required to either evacuate the area or shelter in place, which will interrupt normal routines.

SECTION 21: PIPELINE FAILURE

Hazard Description 1
Location 1
Extent 3
Historical Occurrences 3
Probability of Future Events 3
Vulnerability and Impact 3
Assessment of Impacts 6

HAZARD DESCRIPTION



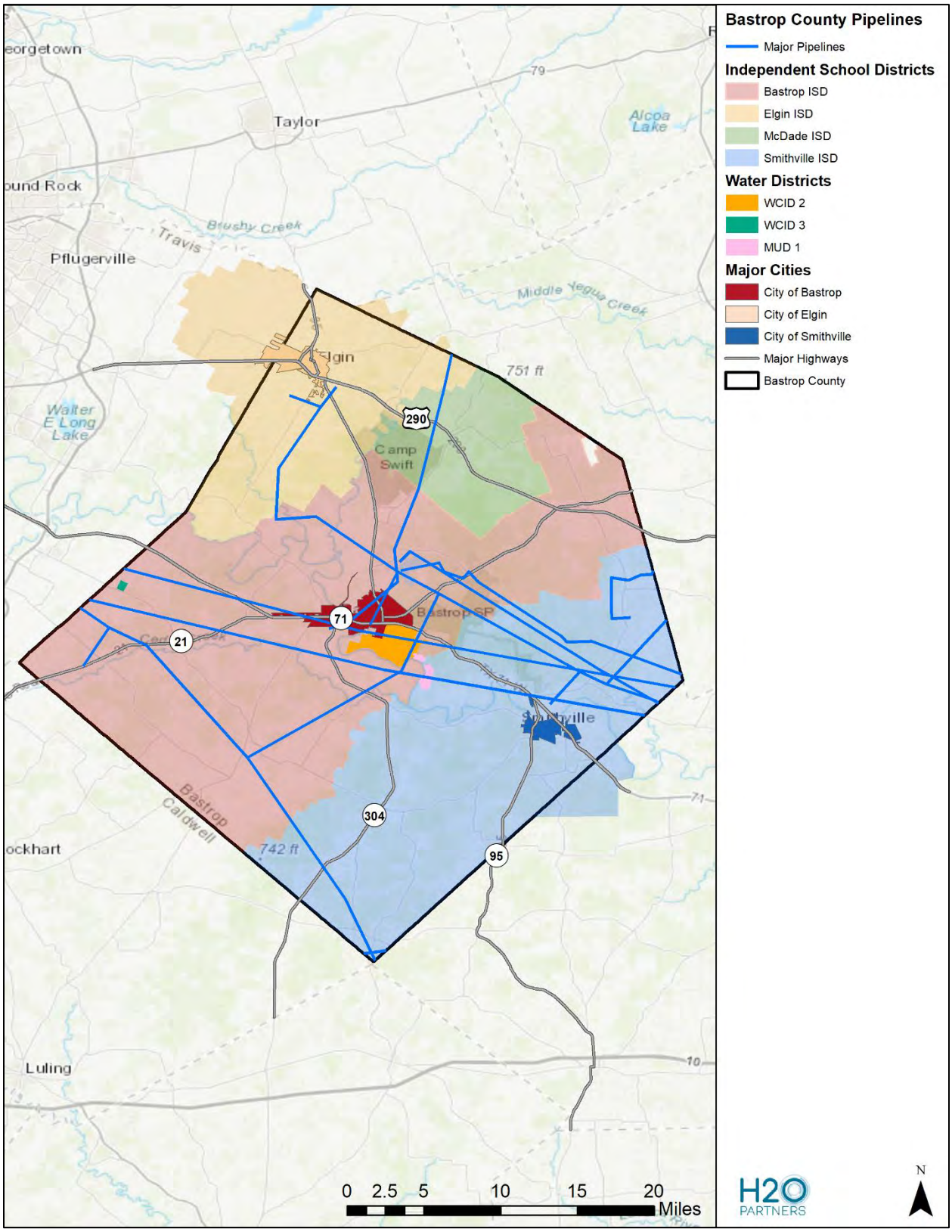
Energy pipeline breach or pipeline failure of an oil or natural gas pipeline is a serious hazard event. An estimated 2.4 million miles of pipelines in the United States carry hazardous materials. Natural gas pipelines transport natural gas and oil. Liquid petroleum pipelines transport crude oil and refined products from crude oils, such as gasoline, home heating oil, jet fuel, kerosene, liquefied propane, ethylene, butane and petrochemical products. Oil pipelines can also transport liquefied gases, such as carbon dioxide.

Pipeline failure is a rare occurrence and has the potential to cause extensive property damage and loss of life. Pipelines have caused fires and explosions that killed more than 200 people and injured more than 1,000 people nationwide with 50 of the injuries in Texas in the last decade.

LOCATION

Figure 21-1 shows the location of gas and oil energy pipelines in the Bastrop County planning area according to the Pipeline and Hazardous Materials Safety Administration and Railroad Commission of Texas. While the pipelines are show by geographical location it is important to note that all participating jurisdictions can be impacted by pipeline failure.

Figure 21-1. Bastrop County Planning Area Pipeline Locations



SECTION 21: PIPLEINE FAILURE

EXTENT

The U.S. Department of Transportation's (DOT) Pipeline and Hazardous Material Safety Administration (PHMSA), acting through the Office of Pipeline Safety (OPS), administers the Department's national regulatory program to assure the safe transportation of natural gas, petroleum, and other hazardous materials by pipeline. The OPS develops regulations and other approaches to risk management to assure safety in design, construction, testing, operation, maintenance, and emergency response of pipeline facilities. Since 1986, the pipeline safety program has been funded by a user-fee assessed on a per-mile basis for all pipeline operators that OPS regulates.

HISTORICAL OCCURRENCES

Pipeline failure events can be caused by corrosion, equipment failure, damage from excavations, incorrect operation, and natural forces. Incidents are generally categorized by severity and type of affected pipeline system component.

The PHMSA defines significant events as those incidents reported by pipeline operators when any of the following occur:

- Fatality or injury requiring in-patient hospitalization;
- $50,000 or more in total costs, measured in 1984 dollars;
- Highly volatile liquid releases of 5 barrels or more or other liquid releases of 50 barrels or more; and
- Liquid releases resulting in an unintentional fire or explosion.

The PHMSA defines a serious pipeline incident as an event involving a fatality or injury requiring in-patient hospitalization.

Table 21-1 summarizes 2 historical pipeline events for the Bastrop County planning area.

Table 21-1. Historical Pipeline Accidents, 2010-2021[1]

JURISDICTION	NUMBER OF EVENTS	INJURIES	FATALITIES	PROPERTY DAMAGE (2021 DOLLARS)
Bastrop County	7/13/2017	0	0	$203,404
Total Losses		**0**	**0**	**$203,404**

PROBABILITY OF FUTURE EVENTS

According to the historical incident data, a pipeline incident for the Bastrop County planning area is Unlikely, and an event is probable on average once every ten years.

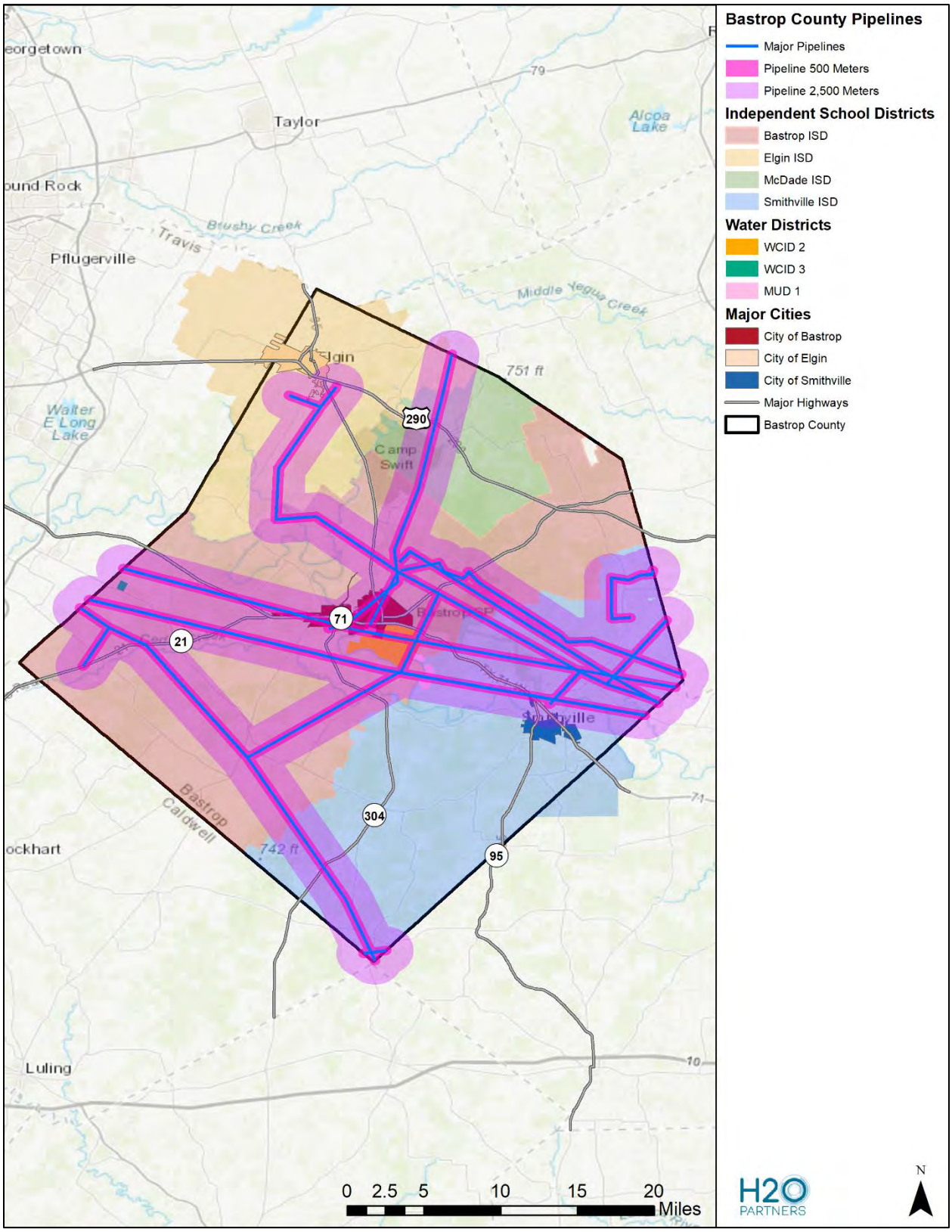
VULNERABILITY AND IMPACT

The analysis for gas pipelines is for natural gas and the analysis for oil pipelines is for natural gas liquids. The immediate and primary area of impact for both types of pipeline events is a 500-meter buffer. The secondary area of impact for both types of pipeline events is a 2,500-meter

[1] Source: Pipeline and Hazardous Materials Safety Administration and Railroad Commission of Texas

buffer. Figure 21-2 shows the pipeline buffer areas. Both types of impact can inflict substantial damage on the surrounding areas. Pipeline breaches have the potential to cause multiple deaths and complete shutdown of facilities for 30 days or more.

Figure 21-2. Pipeline Location with 500- and 2,500-meter buffer



SECTION 21: PIPLEINE FAILURE

Based on historic incidents, pipeline failure can have a “minor” impact on human health and area properties. Pipeline failure events can cause injuries and illnesses that do not result in permanent disability. These events can also cause facilities in the Bastrop County planning area to shut down for approximately one week and cause more than ten percent of affected properties to be destroyed or suffer major damage.

ASSESSMENT OF IMPACTS

The risk to public health and safety during a pipeline failure event depends on a number of factors, including the type and amount of chemical(s) involved, location, weather conditions, time of day, and presence of an ignition source. The location of pipelines determines the potential number of people in proximity to the hazard and is a significant factor when determining the risk to public health and safety. It is possible that a release of materials from a pipeline failure could involve a number of fatalities. It is likely that inhaled hazardous gases may result in respiratory problems, including burning sensations in the lungs, nose, and throat. A release of solids or liquids can be absorbed through the skin, and may cause burns on contact. In some instances, the threat to health and safety may not be evident for an extended period of time.

Depending on the nature and extent of a pipeline failure, the public could be required to either evacuate the area or shelter in place, which will interrupt normal routines. Response personnel are also at risk from more concentrated or prolonged exposure to the agent involved in the event. Through response efforts, response personnel may respond and come in contact with hazardous substances before the nature of the hazard is determined. Response personnel also have a greater likelihood of impacts from secondary explosions or leaks.

Generally, pipeline failure events will interrupt operations and services within a limited area. The nature of the interruption will depend on the facilities in the impacted area. For example, if the event results in the temporary closure or evacuation of a hospital, this will also impact all hospitals in the area because area hospitals may be expected to assume the patient load for the now-inaccessible facility. However, if the event is near non-essential businesses, the operational or service interruption might not be as far-reaching. While the closure of businesses would result in negative impacts for those businesses, this scenario would not have the same community impacts as the first example.

Damage to roadways, railways, and physical infrastructure resulting from a pipeline failure event can impair normal operations and delivery of services.

During a pipeline failure event, the pressure in a pipeline can disrupt the soil above a break. Any facility or piece of infrastructure over or adjacent to a rupture could be damaged or destroyed. If gas ignites, it will set flammable objects near it on fire. Depending on environmental factors such as wind, proximity of vegetation or other fuels, and dryness of the environment, the fire could spread to other nearby structures damaging or destroying them.

Any infrastructure in the area of the incident could be impacted by a pipeline failure event. Gas lines, water lines, sewer lines, and communication lines can be interrupted or destroyed, depending on the nature of the event. If the event is significant enough, utilities in the area may need to be temporarily suspended or disconnected, which would impact multiple facilities and properties.

Environmental risks from pipeline failure events can range from nonexistent to catastrophic, depending on the nature and extent of the release.

SECTION 22: MITIGATION STRATEGY

Mitigation Goals 1
Goal 1 1
Goal 2 1
Goal 3 2
Goal 4 2
Goal 5 2

MITIGATION GOALS

Based on the results of the risk and capability assessments, the Planning Team developed and prioritized the mitigation strategy. This involved utilizing the results of both assessments and reviewing the goals and objectives that were included in the previous 2016 Plan. At the Mitigation Workshop in November 2021, Planning Team members reviewed the mitigation strategy from the previous 2016 Plan. The consensus among all members present was that the strategy developed for the 2016 did not require changes, as it identified overall improvements to be sought in the Plan Update, but the goals have been altered.

GOAL 1

Protect public health and safety.

OBJECTIVE 1.1

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

OBJECTIVE 1.2

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

OBJECTIVE 1.3

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

OBJECTIVE 1.4

Protect critical facilities and services.

GOAL 2

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

OBJECTIVE 2.1

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

OBJECTIVE 2.2

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



OBJECTIVE 2.3
Build hazard mitigation concerns into county, city, ISD, and special districts' planning and budgeting processes.

GOAL 3
Increase public understanding, support, and demand for hazard mitigation.

OBJECTIVE 3.1
Heighten public awareness regarding the full range of natural and man-made hazards the public may face.

OBJECTIVE 3.2
Educate the public on actions they can take to prevent or reduce the loss of life or property from all hazards and increase individual efforts to respond to potential hazards.

OBJECTIVE 3.3
Publicize and encourage the adoption of appropriate hazard mitigation measures.

GOAL 4
Protect new and existing properties.

OBJECTIVE 4.1
Reduce repetitive losses to the National Flood Insurance Program (NFIP).

OBJECTIVE 4.2
Use the most cost-effective approach to protect existing buildings and public infrastructure from hazards.

OBJECTIVE 4.3
Enact and enforce regulatory measures to ensure that future development will not put people in harm's way or increase threats to existing properties.

GOAL 5
Maximize the resources for investment in hazard mitigation.

OBJECTIVE 5.1
Maximize the use of outside sources of funding.

OBJECTIVE 5.2
Maximize participation of property owners in protecting their properties.

OBJECTIVE 5.3
Maximize insurance coverage to provide financial protection against hazard events.

OBJECTIVE 5.4
Prioritize mitigation projects, based on cost-effectiveness and sites facing the greatest threat to life, health, and property.

SECTION 23: PREVIOUS ACTIONS

Summary 1
Bastrop County 2
City of Bastrop 54
City of Elgin 65
City of Smithville 70

SUMMARY

Planning Team members were given copies of the previous mitigation actions submitted in the 2016 Plan at the mitigation workshop. Participating jurisdictions within Bastrop County reviewed the previous actions and provided an analysis as to whether the action had been completed, should be deferred as an ongoing activity, or be deleted from the Plan Update. The actions from the 2016 Plan are included in this section as they were written in 2016, with the exception of the "2022 ANALYSIS" section. The following jurisdictions were not participants within the last plan, therefore there are no past actions for their review: Intendent School District for Bastrop, Elgin, McDade and Smithville, and Bastrop County MUD #1, WCID #2 and #3.

BASTROP COUNTY

	Bastrop County- Previous Action #1
Proposed Action:	All-hazards public information.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	County staff and officials will attend community activities and distribute information about all-hazards, especially for homeowners to mitigate hazards around their homes.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Drought, Earthquakes, Expansive Soils, Extreme Heat, Flood, Hail, Hurricane/Tropical Storms, Lighting, Tornado, Wildfire, Wind, Winter Weather
Estimated Cost:	<$10,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Emergency Management Department
Implementation Schedule:	60 months

2022 ANALYSIS
Defer to 2022 Plan Update. Ongoing- Outreach conducted by Flood Plain Administrators (who routinely speak to the public about flood mitigation techniques). WarnCentralTexas Informational Cards were distributed and preparedness, mitigation, and recovery information has been published via social media and on the Office of Emergency Management website.

SECTION 23: PREVIOUS ACTIONS

	Bastrop County- Previous Action #2
Proposed Action:	Purchase All- Hazard Weather Radios.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	County will purchase NOAA All Hazard Radios and distribute to residents.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Drought, Earthquakes, Extreme Heat, Flood, Hail, Hurricane/Tropical Storms, Lighting, Tornado, Wildfire, Wind, Winter Weather
Estimated Cost:	<$10,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Emergency Management Department
Implementation Schedule:	48 months

2022 ANALYSIS
Not completed- Delete Action.

	Bastrop County- Previous Action #3
Proposed Action:	Build New Command, Control and Communication Facility.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Secure an architect to work with County representatives for the design and build a facility of a hardened facility that will accommodate suitable infrastructure to provide a variety of warning, tracking and notification systems. It will be hardened by the use of tornado, wind, fire, hail, ground movement, and impact resistant materials (windows, doors, roofing, construction, siding, roof bracings); dry-proofing buildings; upgrading to higher standard insulation; installing lighting rods and grounding systems; retrofitting for low flow plumbing; replacing landscaping with drought and fire resistant plants; implementing higher standards for foundations to mitigate impacts of earthquake and expansive soils, and using R-value building materials to resist heat.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Drought, Earthquakes, Expansive Soils, Extreme Heat, Flood, Hail, Hurricane/Tropical Storms, Lighting, Tornado, Wildfire, Wind, Winter Weather
Estimated Cost:	>$100,000
Potential Funding Sources:	Grants, Local Funds
Lead Agency/Department Responsible:	Emergency Management Department
Implementation Schedule:	60 months

2022 ANALYSIS
Completed. This facility is now known as the Mike Fisher Building (1501 Business Park Drive, Bastrop, 78602).

	Bastrop County- Previous Action #4
Proposed Action:	Upgrade low water crossing to include a cast-in-place, multi-box (2) culvert-bridge at Caldwell Road and Wet Weather Creek.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Flooding occurs over road at this low water crossing. This installation upgrade would improve stormwater drainage capacity.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	$10,000 to $100,000
Potential Funding Sources:	Road and Bridge Budget, Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	36 months

2022 ANALYSIS
Defer to 2022 Plan Update. In progress- Funded under GLO-MIT Supplemental HMPG Funding Program.

	Bastrop County- Previous Action #5
Proposed Action:	Upgrade low water crossing to include a cast-in-place, multi-box (2) culvert-bridge at Old Sayers Road and Big Sandy Creek.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Flooding occurs over road at this low water crossing. This installation upgrade would improve stormwater drainage capacity.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	$10,000 to $100,000
Potential Funding Sources:	Road and Bridge Budget, Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	36 months

2022 ANALYSIS
Defer to 2022 Plan Update.

	Bastrop County- Previous Action #6
Proposed Action:	Upgrade low water crossing to include a cast-in-place, multi-box (2) culvert-bridge at Upper Elgin River Road and Cotton DeCreek.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Flooding occurs over road at this low water crossing. This installation upgrade would improve stormwater drainage capacity.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	$10,000 to $100,000
Potential Funding Sources:	Road and Bridge Budget, Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	36 months

2022 ANALYSIS
Delete Action- no longer applicable.

	Bastrop County- Previous Action #7
Proposed Action:	Upgrade existing culvert to include a cast-in-place, multi-box (2) culvert-bridge at Longhorn Trail and Creek Crossing.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Flooding occurs over road at this low water crossing. This installation upgrade would improve stormwater drainage capacity.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	$10,000 to $100,000
Potential Funding Sources:	Road and Bridge Budget, Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	36 months

2022 ANALYSIS
Completed. DR-4245 HMPG Project.

SECTION 23: PREVIOUS ACTIONS

	Bastrop County- Previous Action #8
Proposed Action:	Upgrade structurally deficient wooden bridge to include a box culvert-bridge at Patterson Road and Barton's Creek.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	The wooden bridge is deficient and needs to be replaced. This installation upgrade would improve stormwater drainage capacity.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	$10,000 to $100,000
Potential Funding Sources:	Road and Bridge Budget, Grants, CIP Funds
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	48 months

2022 ANALYSIS
Completed. W/PW on DR-4272 with 406 Mitigation.

	Bastrop County- Previous Action #9
Proposed Action:	Upgrade low water crossing to include cast-in-place, multi-box (3) culvert-bridge at Friendship Road and Turner Creek A and B.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Flooding occurs over road at this low water crossing. This installation upgrade would improve stormwater drainage capacity.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	$10,000 to $100,000
Potential Funding Sources:	Road and Bridge Budget, Grants, CIP Funds
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	36 months

2022 ANALYSIS
Defer to 2022 Plan Update- This could be listed as three (3) separate projects. This was listed as one (1) project because of their close proximity to one another and the intent to let them as one (1) contract. Update proposed action description: Upgrade three (3) low water crossings to cast-in-place multi-box culvert bridges – three (3) locations at the 100 and 200 Blocks of Friendship Road and 400 Block of St. Delight (three (3) tributaries to Pin Oak Creek).

SECTION 23: PREVIOUS ACTIONS

	Bastrop County- Previous Action #10
Proposed Action:	Upgrade to a box culvert-bridge at Hall Road and Young's Branch.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	The bridge is deficient and needs to be replaced. This installation upgrade would improve stormwater drainage capacity.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	$10,000 to $100,000
Potential Funding Sources:	Road and Bridge Budget, Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	24 months

2022 ANALYSIS
Defer to 2022 Plan Update. Ongoing- FEMA Review under DR-4332 HMGP Alternate Project.

	Bastrop County- Previous Action #11
Proposed Action:	Upgrade low water crossing to include cast-in-place, multi-box (2) culvert-bridge at Pine Canyon Drive and Wet Weather Creek.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Flooding occurs over road at this low water crossing. This installation upgrade would improve stormwater drainage capacity.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	$10,000 to $100,000
Potential Funding Sources:	Road and Bridge Budget, Grants, CIP Funds
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	24 months

2022 ANALYSIS
Completed. DR-4332 PW with 406 Mitigation.

SECTION 23: PREVIOUS ACTIONS

	Bastrop County- Previous Action #12
Proposed Action:	Upgrade low water crossing to include cast-in-place, box culvert-bridge at Meduna Road and Barton Oaks Draw 1.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Flooding occurs over road at this low water crossing. This installation upgrade would improve stormwater drainage capacity.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	$10,000 to $100,000
Potential Funding Sources:	Road and Bridge Budget, Grants, CIP Funds
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	36 months

2022 ANALYSIS
Defer to 2022 Plan Update.

SECTION 23: PREVIOUS ACTIONS

	Bastrop County- Previous Action #13
Proposed Action:	Upgrade 5-foot CMP to include cast-in-place, multi-box (2) culvert-bridge at Paffen Road and Grassy Creek Draw.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Flooding occurs over road at this low water crossing. This installation upgrade would improve stormwater drainage capacity.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	$10,000 to $100,000
Potential Funding Sources:	Road and Bridge Budget, Grants, CIP Funds
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	36 months

2022 ANALYSIS
Defer to 2022 Plan Update.

SECTION 23: PREVIOUS ACTIONS

	Bastrop County- Previous Action #14
Proposed Action:	Upgrade low water crossing to include cast-in-place multi-box (2) culvert-bridge at O'Grady Road and Wet Weather Creek.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Flooding occurs over road at this low water crossing. This installation upgrade would improve stormwater drainage capacity.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	$10,000 to $100,000
Potential Funding Sources:	Road and Bridge Budget, Grants, CIP Funds
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	24 months

2022 ANALYSIS
Completed. Funded as DR-4223 HMGP Project.

SECTION 23: PREVIOUS ACTIONS

	Bastrop County- Previous Action #15
Proposed Action:	Circle Road public safety improvement.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Flooded/damaged roadway presents risk to citizens and first responders.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	$10,000 to $100,000
Potential Funding Sources:	Road and Bridge Budget, Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	36 months

2022 ANALYSIS
Completed. Hazard eliminated. On 8/14/2017 Commissioners Court approved closing bridge.

	Bastrop County- Previous Action #16
Proposed Action:	County roadway erosion control.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Damage to county roadways from flooding and erosion will be mitigated by repairing and upgrading culverts and drainage ditches as necessary.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	>$100,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	24 months

2022 ANALYSIS
Defer to 2022 Plan Update.

	Bastrop County- Previous Action #17
Proposed Action:	Expansive soils analysis.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	County will perform soil analysis on county buildings to determine if expansive soils problems exist around foundations.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Expansive Soils
Estimated Cost:	$10,000 to $100,000
Potential Funding Sources:	Grants, Bonds, CIP Funding
Lead Agency/Department Responsible:	Bastrop County Engineer
Implementation Schedule:	24 months

2022 ANALYSIS

Ongoing action, defer to 2022 Plan Update. The County has implemented efforts for expansive soils, including:

- Under the county subdivision regulations, the county requires a geotechnical study by a professional engineer of the development and that the pavement design for all roads be based on that Geotech study to provide a 20-year pavement design.
- For all Bastrop County facilities, the county requires a geotechnical study as a basis for the foundation design. Most recently, at the county Community Center the county removed expansive materials from the building pad site and are replacing it with select fill.

SECTION 23: PREVIOUS ACTIONS

	Bastrop County- Previous Action #18
Proposed Action:	Expansive soils county building monitoring.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	County will work to monitor existing county structures and take action as necessary which may include watering slabs and foundations, installing subgrade irrigation systems, and performing expansive soil construction techniques to prevent more structural damage.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Expansive Soils
Estimated Cost:	<$10,000
Potential Funding Sources:	Grants, Bonds, CIP Funding
Lead Agency/Department Responsible:	Bastrop County Engineer
Implementation Schedule:	36 months

2022 ANALYSIS
Defer to 2022 Plan Update.

	Bastrop County- Previous Action #19
Proposed Action:	Upgrade low water crossing at Marlin Road and Paint Creek Draw.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Roadway floods during rain events, reducing routes of emergency ingress egress for citizens and first responders. Roadway becomes damaged by flood waters and debris. Five or six 24-inch CMPs will be installed to improve stormwater drainage capacity.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	$10,000 to $100,000
Potential Funding Sources:	Road and Bridge Budget, Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	24 months

2022 ANALYSIS
Defer to 2022 Plan Update.

	Bastrop County- Previous Action #20
Proposed Action:	Upgrade low water crossing at Old Sayers Road and Little Sandy Creek.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Roadway floods during rain events, reducing routes of emergency ingress egress for citizens and first responders. Roadway becomes damaged by flood waters and debris. Single box culvert will be installed to improve stormwater drainage capacity.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms, Wildfire
Estimated Cost:	$10,000 to $100,000
Potential Funding Sources:	Road and Bridge Budget, Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	24 months

2022 ANALYSIS
Defer to 2022 Plan Update.

	Bastrop County- Previous Action #21
Proposed Action:	Replace Paint Creek Road Bridge in Precinct 4.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Damage to county road bridge caused by weather and debris. Bridge will be replaced to improve stormwater drainage capacity.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms, Wildfire
Estimated Cost:	>$100,000
Potential Funding Sources:	TXDOT, Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	24 months

2022 ANALYSIS
Completed. Under TxDOT Off-System Bridge Replacement Program.

	Bastrop County- Previous Action #22
Proposed Action:	Old Pine Trail- Ingress Egress Project.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Private property will be purchased or dedicated to public use to construct roadway to allow for another route.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms, Wildfire
Estimated Cost:	$10,000 to $100,000
Potential Funding Sources:	Road and Bridge Budget, Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	24 months

2022 ANALYSIS
Completed. GLO CDBG-DR WFR010001 Project.

SECTION 23: PREVIOUS ACTIONS

	Bastrop County- Previous Action #23
Proposed Action:	All-hazards roadway system.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Identify repetitive traffic incident locations and study all-hazard risks to roadway system. Develop plans for mitigating identified risks, improving traffic safety, and making roadways more resilient to all hazards.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Drought, Earthquakes, Expansive Soils, Extreme Heat, Flood, Hail, Hurricane/Tropical Storms, Lighting, Tornado, Wildfire, Wind, Winter Weather
Estimated Cost:	>$100,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	60 months

2022 ANALYSIS
Defer to 2022 Plan Update.

	Bastrop County- Previous Action #24
Proposed Action:	Develop Urban Wildland Interface Plan.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Develop an effective mitigation, response and recovery plan for wildfire in the urban wildland interface areas by building local capacity, enlisting support from the development community and citizens groups, identifying the more hazardous areas of the “fireplain”.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Estimated Cost:	>$100,000
Potential Funding Sources:	Grants, Donations, General Funds
Lead Agency/Department Responsible:	Emergency Management Department
Implementation Schedule:	24 months

2022 ANALYSIS
Defer to 2021 Plan. Ongoing- Grant funding has been obtained from two (2) different grants (HMGP 5233 & HMGP 5288) to continue this project.

	Bastrop County- Previous Action #25
Proposed Action:	Require Geotechnical Report in Subdivision Ordinances.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	By requiring a geotechnical report for new construction, it allows for onsite soil conditions to be determined before design and construction. This would mitigate future expansive soil foundation problems.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Expansive Soils
Estimated Cost:	< $10,000
Potential Funding Sources:	Homeowners
Lead Agency/Department Responsible:	Building Department
Implementation Schedule:	36 months

2022 ANALYSIS
Completed. Added into Subdivision Regulations on 04/24/2017 to require geotechnical investigation for pavement design.

	Bastrop County- Previous Action #26
Proposed Action:	Floodplain property buyouts – Waters Edge Terrace Subdivision.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Conduct voluntary buyout of homes in the 100-year floodplain and turn the land into deed restricted open space. Timing of implementation depends on available funding and funding sources. There are approximately 12 homes in Waters Edge.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	>$100,000
Potential Funding Sources:	FEMA HMA, CDBG DR, local
Lead Agency/Department Responsible:	Floodplain Coordinator
Implementation Schedule:	36 months

2022 ANALYSIS
Defer to 2022 Plan Update.

	Bastrop County- Previous Action #27
Proposed Action:	Floodplain property buyouts – Hidden Shores Subdivision.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Conduct voluntary buyout of homes in the floodway and turn the land into deed restricted open space. There are approximately 22 homes in Hidden Shores Subdivision.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	>$100,000
Potential Funding Sources:	FEMA HMA, CDBG DR, local
Lead Agency/Department Responsible:	Floodplain Coordinator
Implementation Schedule:	36 months

2022 ANALYSIS
Defer to 2022 Plan Update. In progress- GLO CDBG DR-2017 Floods – Contract 20-066-28-C22.

	Bastrop County- Previous Action #28
Proposed Action:	Floodplain property buyouts – Pecan Shores Subdivision.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Conduct voluntary buyout of homes in the 100-year floodplain and turn the land into deed restricted open space. Timing of implementation depends on available funding and funding sources. There are approximately 48 homes in Pecan Shores.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	>$100,000
Potential Funding Sources:	FEMA HMA, CDBG DR, local
Lead Agency/Department Responsible:	Floodplain Coordinator
Implementation Schedule:	36 months

2022 ANALYSIS
Defer to 2022 Plan Update. In progress- GLO CDBG DR-2017 Floods – Contract 20-066-28-C22.

	Bastrop County- Previous Action #29
Proposed Action:	Assist property owners with the Increased Cost of Compliance NFIP coverage.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Conduct voluntary buyout of homes in the 100-year floodplain and turn the land into deed restricted open space. Timing of implementation depends on available funding and funding sources. There are approximately 48 homes in Pecan Shores.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Estimated Cost:	>$100,000
Potential Funding Sources:	FEMA HMA, CDBG DR, local
Lead Agency/Department Responsible:	Floodplain Coordinator
Implementation Schedule:	36 months

2022 ANALYSIS
Delete Action- No longer a priority.

	Bastrop County- Previous Action #30
Proposed Action:	Design and Implement Improvements at the Clear Springs Lake Dam.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	This is an Orphaned Dam previously owned by a now defunct Property Owners Association. Work with the neighborhood to retain the services of an engineer to analyze and design the necessary improvement and implement those improvements as practical and funding is available. Coordinate design and improvements with TCEQ.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Flood
Estimated Cost:	>$100,000
Potential Funding Sources:	Texas Water Development Board, grants
Lead Agency/Department Responsible:	County Engineer
Implementation Schedule:	36 months

2022 ANALYSIS
Defer to 2022 Plan Update. Dam in on private property- coordinating with legal.

	Bastrop County- Previous Action #31
Proposed Action:	Design and Implement Drainage System Improvements to the J C Madison Addition.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Secure a professional engineer to design improvements (H&H study) to reduce the impacts of flooding within the J C Madison Addition. Environmental justice issues currently exist with this low to moderate income neighborhood. Also the homes are not all located on the correct platted parcel within the neighborhood.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	>$100,000
Potential Funding Sources:	FEMA HMA, CDBG DR, local
Lead Agency/Department Responsible:	County Engineer
Implementation Schedule:	36 months

2022 ANALYSIS
Defer to 2021 Plan. In progress- DR-4245 HMGP Project.

SECTION 23: PREVIOUS ACTIONS

	Bastrop County- Previous Action #32
Proposed Action:	Ingress Egress Road - South thru Roadway Project.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Provide better ingress and egress to south portion of Tahitian Village and Colovista to State Hwy 71. Private property will be purchased or dedicated to public use to construct roadway. It is notable that both these areas were severely impacted by the 2011 Bastrop County Complex Fire.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane / Tropical Storms, Tornado, Wildfire
Estimated Cost:	>$100,000
Potential Funding Sources:	Donation of land, Road and Bridge Budget, Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	24 months

2022 ANALYSIS
Completed. GLO CDBG – DR WRF010001 Project.

	Bastrop County- Previous Action #33
Proposed Action:	Improve Public Safety Radio Coverage in Western side of Bastrop County.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Purchase and install a new radio tower on donated parcel in the western side of the County to improve public safety radio coverage for all weather hazards.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Earthquakes, Extreme Heat, Flood, Hail, Hurricane/Tropical Storms, Lighting, Tornado, Wildfire, Wind, Winter Weather
Estimated Cost:	>$100,000
Potential Funding Sources:	County Funds, Grants
Lead Agency/Department Responsible:	OEM
Implementation Schedule:	36 months

2022 ANALYSIS
Defer to 2022 Plan Update.

	Bastrop County- Previous Action #34
Proposed Action:	Maintain and Improve the Road Closure Database (ATXFloods) and add Mechanical Opening and Closing Devices on Low Water Crossings and Flood Prone Roadways.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Acquisition of software and development of software for the ATXFloods program, hardware acquisition (gauges, cameras, warning lights, bells, whistles and automatic arm gates) and the integration of software between the equipment and the software platform for the County to mitigate people driving through low water and flood prone roadways during events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	>$100,000
Potential Funding Sources:	CDBG, TWDB, FEMA or Private Grants
Lead Agency/Department Responsible:	OEM
Implementation Schedule:	24 months

2022 ANALYSIS
Defer to 2022 Plan Update. Partially Completed- ATX Floods has been maintained. Incomplete for remainder of the proposed action.

	Bastrop County- Previous Action #35
Proposed Action:	Flood Insurance Study in various watersheds in Bastrop County.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Procure the assistance of professional engineering firm to continue the H&H Study work in designated special flood hazard areas and outside designated areas to determine updated special flood hazard areas.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	>$100,000
Potential Funding Sources:	Texas Water Development Board Funding and local funds
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	24 months

2022 ANALYSIS
Defer to 2022 Plan Update: Ongoing- 2007 TWDB of Gil's Branch and Walnut, Piney, Willow, and Gazley Creeks. 2018 TWDB FPP Study of Alum and Wilbarger Creek Watersheds and 2021 TWDB FIS Study of remaining watersheds.

	Bastrop County- Previous Action #36
Proposed Action:	Replace Box Culvert in the vicinity of Old McDade Road in Precinct 4 Near Norwood Road.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Upgrade low water crossing to include a box culvert. This installation upgrade would improve stormwater drainage capacity.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	$10,000 to $100,000
Potential Funding Sources:	Grants, Road and Bridge Budget
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	24 months

2022 ANALYSIS
Completed. DR-4269 406 Project (PW-399).

SECTION 23: PREVIOUS ACTIONS

	Bastrop County- Previous Action #37
Proposed Action:	Low Water Crossing on Green Valley Drive in Precinct 1.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Design and construction of a new bridge. This location is near a school and when this main road is flooded, it makes it difficult to get to the nearby school.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	>$100,000
Potential Funding Sources:	Grants, Road and Bridge Budget
Lead Agency/Department Responsible:	Engineering, Road & Bridge Precinct
Implementation Schedule:	24 months

2022 ANALYSIS
Completed. DR-4223 HMGP Project.

	Bastrop County- Previous Action #38
Proposed Action:	Upgrade flow capacity at Shiloh Road Bridge West of State Hwy 304.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	H&H Study needed as well as retaining an engineer to design a new structure and hire a contractor to install said improvements. This installation upgrade would improve stormwater drainage capacity.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	>$100,000
Potential Funding Sources:	Grants, Road and Bridge Budget
Lead Agency/Department Responsible:	Engineering, Road & Bridge Precinct
Implementation Schedule:	24 months

2022 ANALYSIS
Defer to 2022 Plan Update. Ongoing- GLO CBDG DR-2017 Floods – Contract 20-065-139-C517.

SECTION 23: PREVIOUS ACTIONS

	Bastrop County- Previous Action #39
Proposed Action:	Conduct a study and prioritize projects to address numerous flood prone locations within Bastrop County.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Numerous locations within the county experience flash flood and a study is needed to prioritize the project locations and determine the best design plan for each location.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	>$100,000
Potential Funding Sources:	Grants, Road and Bridge Budget
Lead Agency/Department Responsible:	Engineering, Road & Bridge Precinct
Implementation Schedule:	36 months

2022 ANALYSIS
Defer to 2022 Plan Update. Ongoing.

	Bastrop County- Previous Action #40
Proposed Action:	Vegetative Fuels Reduction.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Mechanically reduce fuel concentrations in the wild-land urban interface to create defensible spaces around homes and create a mosaic pattern consisting of areas of reduced fuels throughout the community to reduce wildfire risks and hazards.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Estimated Cost:	>$100,000
Potential Funding Sources:	Grants, Local Funds
Lead Agency/Department Responsible:	Lost Pines Habitat Conservation Plan
Implementation Schedule:	60 months

2022 ANALYSIS
Defer to 2022 Plan Update. Ongoing.

	Bastrop County- Previous Action #41
Proposed Action:	Upgrade Drainage Structure on Bowie Drive in Precinct 2 at Alum Creek.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Replace existing three 36" CMP's with a multiple span box culvert. Bowie Dr. is the only access for 19 homes and flooding of crossing has necessitated water rescues.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	>$100,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	60 months

2022 ANALYSIS
Completed. DR-4245 HMGP Project

	Bastrop County- Previous Action #42
Proposed Action:	Construct Drainage Structure on Raccoon Road in Precinct 4 at the Tributary near FM 3000.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Replace existing low water crossing with multiple span box culvert. Raccoon Rd provides only access for 20 homes and during significant rain events flooding of crossing restricts access.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	>$100,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	60 months

2022 ANALYSIS
Completed. DR-4245 HMPG Project.

	Bastrop County- Previous Action #43
Proposed Action:	Upgrade Drainage Structure in Willie May Way in Precinct 4 at the Tributary.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Replace existing 4' CMP with a multiple span box culvert. While there are multiple access points to the neighborhood, they are also inundated during flood events limiting access to 100 address points.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	$10,000 to $100,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	60 months

2022 ANALYSIS
Completed. DR-4245 HMGP Project.

SECTION 23: PREVIOUS ACTIONS

	Bastrop County- Previous Action #44
Proposed Action:	Upgrade Drainage on Gotier Trace in Precinct 2 at multiple Tributary crossings.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Improve three existing low water crossings with drainage structures. An unnamed tributary of Gravelly Creek crosses Gotier Trace at three locations causing repetitive roadway damage and hazardous conditions.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	>$100,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	60 months

2022 ANALYSIS
Project was noted as completed on February 22, 2022. - Funded as DR-4272 HMGP Project.

SECTION 23: PREVIOUS ACTIONS

	Bastrop County- Previous Action #45
Proposed Action:	Design and Implement Drainage System improvements to the Tahitian Village Unit 3 Subdivision.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Perform an H&H study and recommend and implement drainage improvements in the Tahitian Village Unit 3 Subdivision. Significant rain events overwhelm the existing drainage system causing flooding of roadways and homes.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	>$100,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	60 months

2022 ANALYSIS
Defer to 2022 Plan Update. In progress- Funded as DR-4272 HMGP Project.

SECTION 23: PREVIOUS ACTIONS

	Bastrop County- Previous Action #47
Proposed Action:	Flooded property buyouts – Repetitive Loss Locations.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Conduct voluntary buyout of homes experiencing repetitive loss due to flooding and turn the land into deed restricted open space. Timing of implementation depends on available funding and funding sources.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	>$100,000
Potential Funding Sources:	FEMA HMA, CDBG DR, local
Lead Agency/Department Responsible:	County Engineer, Floodplain Administrator
Implementation Schedule:	60 months

2022 ANALYSIS
Defer to 2022 Plan Update. Ongoing- GLO CDBG DR-2017 Floods – Contract 20-065-139-C527.

SECTION 23: PREVIOUS ACTIONS

	Bastrop County- Previous Action #48
Proposed Action:	Flooded property elevations – Repetitive Loss Locations.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Provide funding to homeowners experiencing repetitive loss due to flooding to elevate their homes and reduce the risk of future damage. Timing of implementation depends on available funding and funding sources.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	>$100,000
Potential Funding Sources:	FEMA HMA, CDBG DR, local
Lead Agency/Department Responsible:	County Engineer, Floodplain Administrator
Implementation Schedule:	60 months

2022 ANALYSIS
Defer to 2022 Plan Update.

SECTION 23: PREVIOUS ACTIONS

	Bastrop County- Previous Action #49
Proposed Action:	Design and Implement Drainage System improvements to Lakeway Drive and Tuck Street.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Perform an H&H study and recommend and implement drainage improvements in the Bluebonnet Acres Subdivision on Lakeway Dr. and Tuck St. Significant rain events overwhelm the existing drainage system causing flooding of roadways and homes.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	>$100,000
Potential Funding Sources:	FEMA, GLO CDBG-DR
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	60 months

2022 ANALYSIS
Defer to 2022 Plan Update. In progress- Funded under GLO-MIT Supplemental HMPG Funding Program.

	Bastrop County- Previous Action #50
Proposed Action:	Design and Implement Drainage System improvements to Big Bow Spillway.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Design and implement improvements to approximately 100 LF of existing drainage channel to eliminate erosion to the Big Bow Spillway to avoid damage downstream.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	>$100,000
Potential Funding Sources:	FEMA, GLO CDBG-DR
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	60 months

2022 ANALYSIS
Defer to 2022 Plan Update. In progress- GLO CDBG DR2017 Floods – Contract 20-065-139-C527.

	Bastrop County- Previous Action #51
Proposed Action:	Upgrade low water crossings on Hellinger Road to box culvert and widen roadway to allow for ditches and drainage.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Improve existing low water crossing with drainage structure. An unnamed tributary of Buckner's Creek crosses Hellinger Road (700 block) causing repetitive roadway damage and hazardous conditions.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	>$100,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	60 months

2022 ANALYSIS
Defer to 2022 Plan Update.

SECTION 23: PREVIOUS ACTIONS

	Bastrop County- Previous Action #52
Proposed Action:	Upgrade undersized and damaged drainage structures in the 700 Block of Cardinal Drive at Alum Creek (two (2) crossing locations).
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Replace existing undersized drainage structures with larger structures as specified in the TWDB Flood Protection Fund Study of the Alum Creek Watershed. The existing structures are undersized and causing repetitive roadway damage and hazardous conditions.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	>$100,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	60 months

2022 ANALYSIS
Defer to 2022 Plan Update.

	Bastrop County- Previous Action #53
Proposed Action:	Add bank/slope protection and repair erosion in the 100 Block of Karisch Road at Pin Oak Creek.
BACKGROUND INFORMATION	
Jurisdiction/Location:	Bastrop County
Description:	Pin Oak Creek parallels Karisch Road and has caused substantial erosion. Bank/slope protection is required to prevent substantial damage to Karisch Road and eliminate drop-offs.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	>$100,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct
Implementation Schedule:	60 months

2022 ANALYSIS
Defer to 2022 Plan Update.

CITY OF BASTROP

	City of Bastrop- Previous Action #1
Proposed Action:	Public Education for Homeowners.
BACKGROUND INFORMATION	
Jurisdiction/Location:	City of Bastrop
Description:	Educate homeowners on how to mitigate their homes from all hazards through the distribution of pamphlets, flyers, and social media.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Drought, Earthquakes, Expansive Soils, Extreme Heat, Flood, Hail, Hurricane/Tropical Storms, Lighting, Tornado, Wildfire, Wind, Winter Weather
Estimated Cost:	$10,000 to $100,000
Potential Funding Sources:	Tax Revenue
Lead Agency/Department Responsible:	Emergency Management Department
Implementation Schedule:	24 months

2022 ANALYSIS
Defer to 2022 Plan Update. Continuous and ongoing action.

	City of Bastrop- Previous Action #2
Proposed Action:	Purchase back-up powered Generators.
BACKGROUND INFORMATION	
Jurisdiction/Location:	City of Bastrop
Description:	Purchase and install two electric back-up generators (one at the elevated tower and the other for the water treatment plant) which will ensure water can be pumped in the event of a power outage from dam/levee failure, earthquakes, extreme heat, flood, hail, hurricane/tropical storms, lightning, tornado, wildfire, wind, and winter weather.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Earthquakes, Extreme Heat, Flood, Hail, Hurricane/Tropical Storms, Lighting, Tornado, Wildfire, Wind, Winter Weather
Estimated Cost:	$10,000 to $100,000
Potential Funding Sources:	Grants, Tax Revenue, Municipal Bonds
Lead Agency/Department Responsible:	Water and Wastewater Department
Implementation Schedule:	24 months

2022 ANALYSIS
Completed.

	City of Bastrop- Previous Action #3
Proposed Action:	Purchase NOAA All Hazard Radios.
BACKGROUND INFORMATION	
Jurisdiction/Location:	City of Bastrop
Description:	City will purchase NOAA All Hazard Radios and distribute to residents.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Drought, Earthquakes, Extreme Heat, Flood, Hail, Hurricane/Tropical Storms, Lighting, Tornado, Wildfire, Wind, Winter Weather
Estimated Cost:	<$10,000
Potential Funding Sources:	Grants, Tax Revenue
Lead Agency/Department Responsible:	Emergency Management Department
Implementation Schedule:	60 months

2022 ANALYSIS
Defer to 2022 Plan Update.

	City of Bastrop- Previous Action #4
Proposed Action:	Piney Creek Drainage Improvements.
BACKGROUND INFORMATION	
Jurisdiction/Location:	City of Bastrop
Description:	The city has recently introduced an ordinance to annex the portion of the creek so that this action can be completed. This installation improvement would improve stormwater drainage capacity to minimize the risk of loss of life and future flood damages from dam failure, flood, and hurricane/tropical storms.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Flood, Hurricane/Tropical Storms
Estimated Cost:	>$100,000
Potential Funding Sources:	Grants, Tax Revenue, Municipal Bonds
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	36 months

2022 ANALYSIS
Defer to 2022 Plan Update. Piney Creek was annexed into the city limits in 2016, but improvements are outstanding.

	City of Bastrop- Previous Action #5
Proposed Action:	Gills Branch Drainage Improvements.
BACKGROUND INFORMATION	
Jurisdiction/Location:	City of Bastrop
Description:	The city will install improvements to increase stormwater drainage capacity to minimize the risk of loss of life and future flood damages from dam failure, flood, and hurricane/tropical storms.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Flood, Hurricane/Tropical Storms
Estimated Cost:	>$100,000
Potential Funding Sources:	Grants, Tax Revenue, Municipal Bonds
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	24 months

2022 ANALYSIS
Defer to 2022 Plan Update. Have studied the area and have plans for improving Gills Branch, but have not identified funding or started any work.

City of Bastrop- Previous Action #6	
Proposed Action:	Floodplain education.
BACKGROUND INFORMATION	
Jurisdiction/Location:	City of Bastrop
Description:	The city will identify funding and provide a public computer for this information to be accessed by the public.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Estimated Cost:	<$10,000
Potential Funding Sources:	Grants, Tax Revenue, Public Donations
Lead Agency/Department Responsible:	Library Department
Implementation Schedule:	24 months

2022 ANALYSIS
Completed.

	City of Bastrop- Previous Action #7
Proposed Action:	Mitigate Electric power line.
BACKGROUND INFORMATION	
Jurisdiction/Location:	City of Bastrop
Description:	The city will install metal power poles and bury electrical lines underground to minimize damage to poles and electrical power outages from hazard events of dam failure, expansive soils, extreme heat, flood, hail, hurricane/tropical storms, land subsidence, lightning, tornado, wildfire, wind and winter weather.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Expansive Soils, Extreme Heat, Flood, Hurricane/Tropical Storms, Lighting, Tornado, Wildfire, Wind, Winter Weather
Estimated Cost:	>$100,000
Potential Funding Sources:	Grants, Tax Revenue, Electric Revenue
Lead Agency/Department Responsible:	Power and Light
Implementation Schedule:	36 months

2022 ANALYSIS
Defer to 2022 Plan Update. Continuous action.

City of Bastrop- Previous Action #8	
Proposed Action:	Hardened Public shelters.
BACKGROUND INFORMATION	
Jurisdiction/Location:	City of Bastrop
Description:	Existing city buildings would be used as a public shelter and hardened by the use of tornado, wind, fire, hail, ground movement, and impact resistant materials (windows, doors, roofing, construction, siding, roof bracings); dry-proofing buildings; upgrading to higher standard insulation; installing lighting rods and grounding systems; retrofitting for low-flow plumbing; replacing landscaping with drought and fire resistant plants; implementing higher standards for foundations to mitigate impacts of earthquake and expansive soils, and using R-value building materials to resist heat.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Drought, Earthquakes, Expansive Soils, Extreme Heat, Flood, Hail, Hurricane/Tropical Storms, Lighting, Tornado, Wildfire, Wind, Winter Weather
Estimated Cost:	>$100,000
Potential Funding Sources:	Grants, Tax Revenue, Public Donations
Lead Agency/Department Responsible:	Planning and Development
Implementation Schedule:	48 months

2022 ANALYSIS
Defer to 2022 Plan Update.

	City of Bastrop- Previous Action #9
Proposed Action:	Fire and Safety Inspector staffing.
BACKGROUND INFORMATION	
Jurisdiction/Location:	City of Bastrop
Description:	Building codes have been updated to comply with 2011 International Building Codes and an evaluation of staffing needs is needed to comply with this higher standard.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Estimated Cost:	$10,000 to $100,000
Potential Funding Sources:	Grants, Tax Revenue
Lead Agency/Department Responsible:	Planning and Development
Implementation Schedule:	12 months

2022 ANALYSIS
Completed. Updated Codes to 2018 IBC.

	City of Bastrop- Previous Action #10
Proposed Action:	Wildfire mitigation– for new developments and ETJ area.
BACKGROUND INFORMATION	
Jurisdiction/Location:	City of Bastrop
Description:	The city has passed a 1445 Agreement and is currently updating its Comprehensive Plan outlining goals and strategies for wildfire mitigation program in new developments and ETJ area.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Estimated Cost:	>$100,000
Potential Funding Sources:	Grants, Local Funds, Cooperative Partnerships
Lead Agency/Department Responsible:	Planning and Development
Implementation Schedule:	12 months

2022 ANALYSIS
Defer to 2022 Plan Update. 1445 Agreement approved, but no wildfire mitigation programs established.

SECTION 23: PREVIOUS ACTIONS

City of Bastrop- Previous Action #11	
Proposed Action:	Communication equipment.
BACKGROUND INFORMATION	
Jurisdiction/Location:	City of Bastrop
Description:	The city will continue to upgrade/replace older communication equipment, purchase additional equipment, and explore the use of non-traditional means of communicating with resources responding to the incident as well as notifying the public.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Drought, Earthquakes, Extreme Heat, Flood, Hail, Hurricane/Tropical Storms, Lighting, Tornado, Wildfire, Wind, Winter Weather
Estimated Cost:	>$100,000
Potential Funding Sources:	Grants, Local Funds, Municipal Bonds
Lead Agency/Department Responsible:	Information Technology
Implementation Schedule:	36 months

2022 ANALYSIS
Completed.

CITY OF ELGIN

	City of Elgin- Previous Action #1
Proposed Action:	Construct hardened recreation/shelter/ EOC facility.
BACKGROUND INFORMATION	
Jurisdiction/Location:	City of Elgin
Description:	The City of Elgin has selected the site and determined that the hardened recreation/shelter facility will cost $3 million. The facility will be hardened by the use of tornado, wind, fire, hail, ground movement, and impact resistant materials (windows, doors, roofing, construction, siding, roof bracings); dry-proofing buildings; upgrading to higher standard insulation; installing lighting rods and grounding systems; retrofitting for lowflow plumbing; replacing landscaping with drought and fire resistant plants; implementing higher standards for foundations to mitigate impacts of earthquake and expansive soils, and using R-value building materials to resist heat.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Earthquakes, Expansive Soils, Extreme Heat, Flood, Hail, Hurricane/Tropical Storms, Lighting, Tornado, Wildfire, Wind, Winter Weather
Estimated Cost:	>$100,000
Potential Funding Sources:	City Funds, Grants
Lead Agency/Department Responsible:	Planning and Development
Implementation Schedule:	24 months

2022 ANALYSIS
Completed.

	City of Elgin- Previous Action #2
Proposed Action:	Acquisition of generators.
BACKGROUND INFORMATION	
Jurisdiction/Location:	City of Elgin
Description:	The City will install emergency generators at critical facilities to provide back-up power from hazard events of dam/levee failure, earthquakes, extreme heat, flood, hail, hurricane/tropical storms, lightning, tornado, wildfire, wind, and winter weather.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Earthquakes, Extreme Heat, Flood, Hail, Hurricane/Tropical Storms, Lighting, Tornado, Wildfire, Wind, Winter Weather
Estimated Cost:	>$100,000
Potential Funding Sources:	ORCA Grant
Lead Agency/Department Responsible:	Planning and Development
Implementation Schedule:	24 months

2022 ANALYSIS
Defer to 2022 Plan Update. Implementation is still underway.

	City of Elgin- Previous Action #3
Proposed Action:	2nd Street Drainage Project.
BACKGROUND INFORMATION	
Jurisdiction/Location:	City of Elgin
Description:	This project reduces repetitive loss to structures in the area by increasing stormwater drainage capacity from flood, hurricane/tropical storms, and investigates soil characteristics to mitigate expansive soil cracking around drain.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	>$100,000
Potential Funding Sources:	TXDOT, City Funds
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	36 months

2022 ANALYSIS
Completed.

	City of Elgin- Previous Action #4
Proposed Action:	Brenham Street Crossing.
BACKGROUND INFORMATION	
Jurisdiction/Location:	City of Elgin
Description:	This project reduces repetitive loss to structures in the area by increasing stormwater drainage capacity from flood, hurricane/tropical storms, and investigates soil characteristics to mitigate expansive soil cracking around drain.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	>$100,000
Potential Funding Sources:	ORCA Grant, City Funds, CDBG
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	60 months

2022 ANALYSIS
Completed.

	City of Elgin- Previous Action #5
Proposed Action:	Conduct public outreach to educate homeowners.
BACKGROUND INFORMATION	
Jurisdiction/Location:	City of Elgin
Description:	Educate homeowners on how to mitigation their homes from all hazards via: a weekly newsletter and a 24-hour TV station available for use.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Earthquakes, Expansive Soils, Extreme Heat, Flood, Hail, Hurricane/Tropical Storms, Lighting, Tornado, Wildfire, Wind, Winter Weather
Estimated Cost:	<$10,000
Potential Funding Sources:	City Funds, Grants
Lead Agency/Department Responsible:	Emergency Management Department
Implementation Schedule:	36 months

2022 ANALYSIS
Defer to 2022 Plan Update. Revise Department Responsible to “Community Services- Public Information Officer”.

CITY OF SMITHVILLE

	City of Smithville- Previous Action #1
Proposed Action:	Expand Smithville Recreation Center to improve shelter-in- place capability.
BACKGROUND INFORMATION	
Jurisdiction/Location:	City of Smithville
Description:	The architecture and design plans will meet the emergency shelter requirements that include administrative area, bathroom, shower and locker facilities, kitchen, pantry, laundry, and gym area to house displaced residents from hazard events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Flood, Hurricane/Tropical Storms, Tornado, Wildfire, Wind, Winter Weather
Estimated Cost:	<$10,000
Potential Funding Sources:	GLO-HUD
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	24 months

2022 ANALYSIS
Completed. The Smithville Recreation Center expansion/renovation was completed on 8/22/2017.

	City of Smithville- Previous Action #2
Proposed Action:	Educate/inform homeowners about mitigation techniques.
BACKGROUND INFORMATION	
Jurisdiction/Location:	City of Smithville
Description:	Educate homeowners on how to mitigation their homes from all hazards on city website and public forums.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Drought, Expansive Soils, Extreme Heat, Flood, Hail, Hurricane/Tropical Storms, Lighting, Tornado, Wildfire, Wind, Winter Weather
Estimated Cost:	<$10,000
Potential Funding Sources:	City Funds
Lead Agency/Department Responsible:	Emergency Management Department
Implementation Schedule:	36 months

2022 ANALYSIS
Completed. Social media and the city website have been successfully used to educate and notify residents of specific hazards (e.g., inclement weather, fire evacuations, road closures, severe winter weather, etc.).

	City of Smithville- Previous Action #3
Proposed Action:	Conduct city-wide drainage improvements.
BACKGROUND INFORMATION	
Jurisdiction/Location:	City of Smithville
Description:	Obtain engineering cost estimate for citywide drainage improvements taking into consideration identified repetitive floodprone areas (residential and commercial). This involves increasing the capacity of drainage system at certain locations.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Estimated Cost:	>$100,000
Potential Funding Sources:	Federal, State Grants, Revenue Bonds
Lead Agency/Department Responsible:	City Administration
Implementation Schedule:	12 months

2022 ANALYSIS
Completed. Multiple flood mitigation projects have been funded and completed to address flood-prone areas of the community: FEMA HMG (DR-4223) – 7th Street Detention Pond FEMA HMG (DR-4245) – Marburger Drainage Conveyance / Improvements FEMA HMG (DR-4266) – 7th Street Drainage Conveyance FEMA HMG (DR-4272) – Warehouse Detention Pond

	City of Smithville- Previous Action #4
Proposed Action:	Purchase NOAA All Hazard Radios.
BACKGROUND INFORMATION	
Jurisdiction/Location:	City of Smithville
Description:	City will purchase NOAA All Hazard Radios and distribute to residents.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Drought, Extreme Heat, Flood, Hail, Hurricane/Tropical Storms, Lighting, Tornado, Wildfire, Wind, Winter Weather
Estimated Cost:	<$10,000
Potential Funding Sources:	City Funds
Lead Agency/Department Responsible:	Emergency Management Department
Implementation Schedule:	60 months

2022 ANALYSIS
Delete Action. No intention to complete project.

	City of Smithville- Previous Action #5
Proposed Action:	Adopt building code on property perimeter drainage systems.
BACKGROUND INFORMATION	
Jurisdiction/Location:	City of Smithville
Description:	Adopt building code on property perimeter drainage systems around the outside of basement footings for new construction to mitigate the expanding and contracting of expansive soil issues.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Expansive Soils, Flood
Estimated Cost:	<$10,000
Potential Funding Sources:	City Funds
Lead Agency/Department Responsible:	City Administration
Implementation Schedule:	36 months

2022 ANALYSIS
Complete. The City of Smithville Building Code (Chapter 3, Article 3.02) has been modified as follows: “All new construction within the City of Smithville require the finished floor elevation / foundation to be twelve inches (12”) above the crest of the road. In addition, the perimeter drainage system around the outside of the base foundation for shall be designed to mitigate the expansion and contraction of expansive soil.”

SECTION 24: MITIGATION ACTIONS

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SUMMARY

As discussed in Section 2, at the mitigation workshop the planning team and stakeholders met to develop mitigation actions for each of the natural hazards included in the Plan Update. Each of the actions in this section were prioritized based on FEMA's Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLEE) criteria necessary for the implementation of each action.

As part of the economic evaluation of the STAPLEE analysis, jurisdictions analyzed each action in terms of the overall costs, measuring whether the potential benefit to be gained from the action outweighed costs associated with it. As a result of this exercise, priority was assigned to each mitigation action by marking them as High (H), Moderate (M), or Low (L). An action that is ranked as "High" indicates that the action will be implemented as soon as funding is received. A "Moderate" action is one that may not be implemented right away depending on the cost and number of citizens served by the action. Actions ranked as "Low" indicate that they will not be implemented without first seeking grant funding and after "High" and "Moderate" actions have been completed.

All mitigation actions created by Planning Team members are presented in this section in the form of Mitigation Action Worksheets. More than one hazard is sometimes listed for an action, if appropriate. Actions presented in this section represent a comprehensive range of mitigation actions per current State and FEMA Guidelines, including two actions, per hazard, and of two different types for each participating jurisdiction. The term county-wide action refers to Bastrop County and the Cities of Bastrop, Elgin, and Smithville.

SECTION 24: MITIGATION ACTIONS

Table 24-1. Bastrop County Mitigation Action Matrix

TYPE OF ACTION	
Action #1 – Plans/Regulations (Blue)	Action #4 – Structural (Orange)
Action #2 – Education/Awareness (Red)	Action #5 – Preparedness/Response (Black)
Action #3 – Natural Systems Protections (Green)	

Jurisdiction	Flood	Wildfire	Extreme Heat	Tornado	Drought	Hurricane Wind	Lightning	Hail	Thunderstorm Wind	Winter Storm	Dam and Levee Failure	Earthquake	Expansive Soils
Bastrop County	xxxx	xxxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
City of Bastrop	xxx	xxx	xx	xx	xx	xxx	xx	xx	xx	xx	xxx	xx	xx
City of Elgin	xxx	xxx	xx	xx	xxx	xxx	xx	xx	xx	xx	N/A	xx	xxx
City of Smithville	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Bastrop ISD	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx
Elgin ISD	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	N/A	xx	xx
McDade ISD	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	N/A	xx	xx
Smithville ISD	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	N/A	xxx	xxx
Bastrop County MUD #1	xxxx	xxx	xxx	xxx	xx	xxx	xxx	xxx	xxx	xxx	N/A	xxx	xx
Bastrop County WCID #2	xxx	xxx	xx	xx	xxx	xx	xx	xx	xxx	xxx	N/A	xx	xx
Bastrop County WCID #3	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	N/A	xx	xx

BASTROP COUNTY – COUNTY-WIDE ACTIONS

		Bastrop County-wide– Action #1
	Proposed Action:	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages.
	BACKGROUND INFORMATION	
	Site and Location:	County-wide, including Cities of Bastrop, Elgin, and Smithville
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Promote hazard awareness and protect citizens from potential injuries and damages.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure (where applicable), Drought, Expansive Soils, Extreme Heat, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm, Hurricane/Tropical Storm, Earthquake
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$10,000
Potential Funding Sources:	Local Funds (staff time), State and Federal Grants
Lead Agency/Department Responsible:	County and Local Emergency Managers
Implementation Schedule:	Within 24 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

		Bastrop County-wide– Action #2
	Proposed Action:	Acquire and install generators with hard wired quick connections at all critical facilities.
	BACKGROUND INFORMATION	
	Site and Location:	County-wide, including Cities of Bastrop, Elgin, and Smithville
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Provide power for critical facilities during power outages and ensure continuity of critical services.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure (where applicable), Extreme Heat, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm, Earthquake, Hurricane/Tropical Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,000,000
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	County Public Works/City Engineer/City Administrator
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Enables safe and fast connection to electrical system.

	Bastrop County-wide– Action #3
Proposed Action:	Upgrade critical facilities to include drought mitigation measures and expansive soils protection such as greywater reuse systems, drought tolerant landscaping, installation of a sprinkler system with regular watering schedule and installation of French drains where high plasticity soils are indicated.
BACKGROUND INFORMATION	
Site and Location:	County-wide, including Cities of Bastrop, Elgin, and Smithville
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce damages at critical facilities.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Expansive Soils
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$100,000
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	County Public Works/City Engineer/City Administrator
Implementation Schedule:	Within 24 months of plan adoption
Incorporation into Existing Plans:	Capital Improvement Plan (applicable jurisdictions)

COMMENTS:

		Bastrop County-wide– Action #4
	Proposed Action:	Harden/retrofit critical facilities to hazard-resistant levels.
	BACKGROUND INFORMATION	
	Site and Location:	County-wide, including Cities of Bastrop, Elgin, and Smithville
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce damages at critical facilities; Ensure continuity of critical services during and after event; Reduce risk of injury to emergency and critical personnel.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure (where applicable), Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm, Earthquake
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,000,000
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	County Public Works/City Engineer/City Administrator
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan; Capital Improvement Plan (applicable jurisdictions)

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

	Bastrop County-wide– Action #5
Proposed Action:	Complete an updated soil survey for the entire county.
BACKGROUND INFORMATION	
Site and Location:	County-wide, including Cities of Bastrop, Elgin, and Smithville, along with Bastrop ISD, Elgin ISD, McDade ISD, Smithville ISD, MUD #1, WCID #2, WCID #3
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Enhance the risk assessment for expansive soils; Inform future development decisions by identifying area with high plasticity index ranges; Reduce future losses due to expansive soils.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Expansive Soils
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new structures and infrastructure
Priority (High, Moderate, Low):	Low
Estimated Cost:	$50,000
Potential Funding Sources:	Local Funds, State and Federal Grants, USGS
Lead Agency/Department Responsible:	County Public Works/City Engineer/City Administrator
Implementation Schedule:	Within 36 months of plan adoption
Incorporation into Existing Plans:	Capital Improvement Plan (applicable jurisdictions)

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Enhances risk assessment and informs future development decisions.

BASTROP COUNTY

		Bastrop County – Action #1
	Proposed Action:	Hire consultant to assist in updating Community Wildfire Protection Plan (CWPP).
	BACKGROUND INFORMATION	
	Site and Location:	County-wide project
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Reduce risk to property and loss of life.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$50,000 - $100,000
Potential Funding Sources:	Local, State, Federal funds, Grants, CIP funding, Bonds
Lead Agency/Department Responsible:	Bastrop County Administration and OEM
Implementation Schedule:	Within 6 - 12 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:

		Bastrop County – Action #2
	Proposed Action:	Hire a consult to develop Continuity of Operations Plan (COOP).
	BACKGROUND INFORMATION	
	Site and Location:	County-wide project
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Reduce risk to property and loss of life.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm, Earthquake, Expansive Soils, Infectious Disease, Cyber Attack, Pipeline Failure, Hazardous Materials
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$50,000 - $100,000
Potential Funding Sources:	Local, State, Federal funds, Grants, CIP funding, Bonds
Lead Agency/Department Responsible:	Bastrop County Administration and OEM
Implementation Schedule:	Within 6 - 12 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Allows for continuation of services to make response efforts more efficient.

	Bastrop County – Action #3
Proposed Action:	Drainage Improvements: Improve drainage ditch flow.
BACKGROUND INFORMATION	
Site and Location:	County-wide project
Risk Reduction Benefit (Current Cost/Losses Avoided):	Reduce risks to residents and property; Reduce on-going repair cost.
Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	>$500,000
Potential Funding Sources:	Local, State and Federal funds, Grants
Lead Agency/Department Responsible:	Bastrop County Precinct 3
Implementation Schedule:	Within 24-36 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces overall cost for community.

		Bastrop County – Action #4
	Proposed Action:	Design and construct a bridge across the Colorado River connecting Lowers Lane and SH 304.
	BACKGROUND INFORMATION	
	Site and Location:	Colorado River connecting Lowers Lane and SH 304
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Improve localized flooding; Reduce risk to property and loss of life.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$22,000,000
Potential Funding Sources:	Local, State, Federal Funds, Private Funds, Grants
Lead Agency/Department Responsible:	County Engineer
Implementation Schedule:	Within 24-36 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk to residents.

		Bastrop County – Action #5
	Proposed Action:	Design and construct Overpasses & Frontage Roads on SH71 at signalized intersections.
	BACKGROUND INFORMATION	
	Site and Location:	SH71, FM 1209, Pope Bend Rd. and Tucker Hill Rd.
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Reduce risk to property and loss of life.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Communication
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000,000
Potential Funding Sources:	TxDOT, Grants
Lead Agency/Department Responsible:	Floodplain Coordinator
Implementation Schedule:	Within 60 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	Transportation and Thoroughfare plans

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk to residents.

		Bastrop County – Action #6
	Proposed Action:	Design and Implement Drainage System Improvements.
	BACKGROUND INFORMATION	
	Site and Location:	Bastrop County West Oaks Subdivision (W Oak Loop)
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Improve localized flooding and stormwater drainage capacity; Reduce risk to property and loss of life.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000 - $500,000
Potential Funding Sources:	Road and Bridge Budget, CIP Funds, Grants
Lead Agency/Department Responsible:	County Engineer, Road and Bridge Precinct/Department
Implementation Schedule:	Within 36 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces overall cost for community.

	Bastrop County – Action #7
Proposed Action:	Upgrade existing single culvert with a bridge structure.
BACKGROUND INFORMATION	
Site and Location:	Paint Creek South Rd at Rocky Creek
Risk Reduction Benefit (Current Cost/Losses Avoided):	Improve stormwater drainage capacity; Reduce risk to property and loss of life.
Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000 - $500,000
Potential Funding Sources:	Road and Bridge Budget, CIP Funds, Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct/Department
Implementation Schedule:	Within 36 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces overall cost for community.

	Bastrop County – Action #8
Proposed Action:	Replace with a 25 year storm event bridge.
BACKGROUND INFORMATION	
Site and Location:	Boyd Rd. N 29° 58’ 16” W 97° 30’ 46” High Grove Rd N 30° 01’ 22” W 97° 28’ 06” High Grove Rd N 30° 00’ 40” W 97° 28’ 40” Legend Oaks Dr. N 30° 04’ 05” W 97° 35’ 56” Lower Red Rock Rd N 30° 03’ 35” W 97° 22’ 17” Lower Red Rock Rd N 30° 03’ 26” W 97° 22’ 17” Lower Red Rock Rd N 30° 01’ 42” W 97° 22’ 44” Petty Town Rd. N 29° 56’ 01” W 97° 26’ 38” Watterson Rd. N 29° 57’ 25” W 97° 24’ 10” Wilson Rd. N 29° 57’ 42” W 97° 28’ 23”
Risk Reduction Benefit (Current Cost/Losses Avoided):	Reduce risk to property and loss of life. Reduce on-going repair cost.
Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$600,000 to $800,000 based on site location
Potential Funding Sources:	Local Revenue, HMGP, other funding
Lead Agency/Department Responsible:	Bastrop County Precinct 3
Implementation Schedule:	Within 36-60 months of plan adoptions, or upon available funding
Incorporation into Existing Plans:	Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces overall cost for community.

		Bastrop County – Action #9
	Proposed Action:	Replacement of low water crossing with a bridge/ box culvert.
	BACKGROUND INFORMATION	
	Site and Location:	Artesian Dr. N 30° 00’ 57” W 97° 32’ 00” Earl Callahan Rd N30° 03’ 57” W 97° 26’ 20” Jenkins Rd N 30°06’26” W 97°29’40” Klaus Ln N 29° 55’ 47” W 97° 25’ 57” McDowell Rd N 30°05’50” W 97°34’43” Pleasant Chapel Rd N 30° 01’ 47” W 97° 25’ 57” Rianna Woods Dr. N 30° 00’ 19” W 97° 34’ 12” Riddle Rd. N 30° 01’ 01” W 97° 32’ 24” Shiloh Rd N 30°05’42” W 97°26’22”
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Reduce risk to property and loss of life. Reduce on-going repair cost.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$500,000 to $700,000 based on site location
Potential Funding Sources:	Local Revenue, HMGP, other funding
Lead Agency/Department Responsible:	Bastrop County Precinct 3
Implementation Schedule:	Within 36-60 months of plan adoptions, or upon available funding
Incorporation into Existing Plans:	Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces overall cost for community.

		Bastrop County – Action #10
	Proposed Action:	Rehabilitate existing roadways with cement treated sub-base and seal coat.
	BACKGROUND INFORMATION	
	Site and Location:	Various locations in Precinct 3
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Reduce risks to residents and property. Reduce on-going repair cost.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Expansive Soils
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,000,000
Potential Funding Sources:	Local, State and Federal funds, HMGP, Other Grants
Lead Agency/Department Responsible:	Bastrop County Precinct 3
Implementation Schedule:	Within 24-36 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	Capital Improvements Plan

COMMENTS:

		Bastrop County – Action #11
	Proposed Action:	Development of a Community Wildfire Protection Plan.
	BACKGROUND INFORMATION	
	Site and Location:	County-wide project
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Reduce risks to residents and property.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Local Plans and Regulations, Education and Awareness.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Communication
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$250,000
Potential Funding Sources:	Local, State and Federal funds, Grants
Lead Agency/Department Responsible:	Office of Emergency Management
Implementation Schedule:	Within 12-24 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	N/A

COMMENTS:

		Bastrop County – Action #12
	Proposed Action:	Development and adoption/implementation of a Fire Code.
	BACKGROUND INFORMATION	
	Site and Location:	County-wide project
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Reduce risks to residents and property.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Local Plans and Regulations, Education and Awareness.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Communication
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$250,000
Potential Funding Sources:	Local, State and Federal funds, Grants
Lead Agency/Department Responsible:	Commissioners Court
Implementation Schedule:	Within 12-24 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	Local Ordinances/Building Codes

COMMENTS:

		Bastrop County – Action #13
	Proposed Action:	Creation of a Fire Marshal.
	BACKGROUND INFORMATION	
	Site and Location:	County-wide project
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Reduce risks to residents and property.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Preparedness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Communication
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$160,000
Potential Funding Sources:	Local, State and Federal funds, Grants
Lead Agency/Department Responsible:	Commissioners Court
Implementation Schedule:	Within 12-24 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	N/A

COMMENTS:

	Bastrop County – Action #14
Proposed Action:	All-hazards public information, by means of informational cards, social media, and/or county website.
BACKGROUND INFORMATION	
Site and Location:	County-wide project
Risk Reduction Benefit (Current Cost/Losses Avoided):	Reduce loss of life.
Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$5,000
Potential Funding Sources:	Local, State and Federal funds, Grants
Lead Agency/Department Responsible:	Office of Emergency Management, Floodplain Administrator
Implementation Schedule:	Within 12-24 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	N/A

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

	Bastrop County – Action #15
Proposed Action:	All-hazards roadway system. Identify repetitive traffic incident locations and study all-hazard risks to roadway system. Develop plans for mitigating identified risks, improving traffic safety, and making roadways more resilient to all hazards.
BACKGROUND INFORMATION	
Site and Location:	County-wide project
Risk Reduction Benefit (Current Cost/Losses Avoided):	Reduce loss of life.
Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Education and Awareness, Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Drought, Earthquake, Expansive Soils, Flood, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000
Potential Funding Sources:	Local, State and Federal funds, Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct/Department
Implementation Schedule:	Within 36-60 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	Transportation and Thoroughfare plans

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

		Bastrop County – Action #16
	Proposed Action:	Improve Public Safety Radio Coverage. Purchase and install a new radio tower on donated parcel in the western side of the County to improve public safety radio coverage for all weather hazards.
	BACKGROUND INFORMATION	
	Site and Location:	Western side of Bastrop County
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Reduce loss of life.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$800,000
Potential Funding Sources:	Local, State and Federal funds, Grants
Lead Agency/Department Responsible:	Office of Emergency Management
Implementation Schedule:	Within 36-60 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	Capital Improvements Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects prevents injury to residents.

		Bastrop County – Action #17
	Proposed Action:	Maintain and Improve the Road Closure Database (ATXFloods).
	BACKGROUND INFORMATION	
	Site and Location:	County-wide project
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Reduce loss of life.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000
Potential Funding Sources:	Local, State and Federal funds, Grants
Lead Agency/Department Responsible:	Office of Emergency Management
Implementation Schedule:	Within 24-36 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	N/A

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects injury to residents.

	Bastrop County – Action #18
Proposed Action:	Upgrade low water crossing to include a cast-in-place, multi-box culvert-bridge.
BACKGROUND INFORMATION	
Site and Location:	Caldwell Road and Wet Weather Creek
Risk Reduction Benefit (Current Cost/Losses Avoided):	Improve drainage capacity; Reduce risk to property and loss of life.
Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000 - $500,000
Potential Funding Sources:	GLO-MIT Supplemental HMPG Funding Program
Lead Agency/Department Responsible:	Road and Bridge Precinct/Department
Implementation Schedule:	Within 24-36 months of plan adoption
Incorporation into Existing Plans:	Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

	Bastrop County – Action #19
Proposed Action:	Upgrade low water crossing to a box culvert-bridge.
BACKGROUND INFORMATION	
Site and Location:	Hall Road and Young's Branch
Risk Reduction Benefit (Current Cost/Losses Avoided):	Improve drainage capacity; Reduce risk to property and loss of life.
Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000 - $500,000
Potential Funding Sources:	FEMA Review under DR-4332 HMGP Alternate Project.
Lead Agency/Department Responsible:	Road and Bridge Precinct/Department
Implementation Schedule:	Within 24-36 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

		Bastrop County – Action #20
	Proposed Action:	Develop Urban Wildland Interface Plan that contains an effective mitigation, response and recovery plan for wildfire in the urban wildland interface areas by building local capacity, enlisting support from the development community and citizens group.
	BACKGROUND INFORMATION	
	Site and Location:	County-wide project
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Reduce risk to property and loss of life.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000
Potential Funding Sources:	HMGP 5233 & HMGP 5288
Lead Agency/Department Responsible:	Office of Emergency Management
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	CWPP

COMMENTS:

		Bastrop County – Action #21
	Proposed Action:	Conduct voluntary buyout of homes in the floodway and turn the land into deed restricted open space.
	BACKGROUND INFORMATION	
	Site and Location:	Hidden Shores Subdivision- Approximately 22 homes
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Reduce risk to property and loss of life.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project, Natural Systems Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$500,000+
Potential Funding Sources:	GLO CDBG DR-2017 Floods – Contract 20-066-28-C22.
Lead Agency/Department Responsible:	Floodplain Administrator/Coordinator
Implementation Schedule:	Within 36-60 months of plan adoption
Incorporation into Existing Plans:	Flood Mitigation Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Allocates areas for flood mitigation and increases public safety.

		Bastrop County – Action #22
	Proposed Action:	Conduct voluntary buyout of homes in the 100-year floodplain and turn the land into deed restricted open space.
	BACKGROUND INFORMATION	
	Site and Location:	Pecan Shores Subdivision- Approximately 48homes
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Reduce risk to property and loss of life.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project, Natural Systems Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$500,000+
Potential Funding Sources:	GLO CDBG DR-2017 Floods – Contract 20-066-28-C22
Lead Agency/Department Responsible:	Floodplain Administrator/Coordinator
Implementation Schedule:	Within 36-60 months of plan adoption
Incorporation into Existing Plans:	Flood Mitigation Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Allocates areas for flood mitigation and increases public safety.

	Bastrop County – Action #23
Proposed Action:	Conduct voluntary buyout of homes experiencing repetitive loss due to flooding and turn the land into deed restricted open space.
BACKGROUND INFORMATION	
Site and Location:	Repetitive Loss locations within Bastrop County
Risk Reduction Benefit (Current Cost/Losses Avoided):	Reduce risk to property and loss of life.
Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project, Natural Systems Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$500,000+
Potential Funding Sources:	GLO CDBG DR-2017 Floods – Contract 20-065-139-C527
Lead Agency/Department Responsible:	Floodplain Administrator/Coordinator, County Engineer
Implementation Schedule:	Within 36-60 months of plan adoption
Incorporation into Existing Plans:	Flood Mitigation Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Allocates areas for flood mitigation and increases public safety.

		Bastrop County – Action #24
	Proposed Action:	Design and Implement Drainage System Improvements. Secure a professional engineer to design improvements (H&H study) to reduce the impacts of flooding.
	BACKGROUND INFORMATION	
	Site and Location:	J C Madison Addition
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Improve drainage capacity. Reduce risk to property and loss of life.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000+
Potential Funding Sources:	DR-4245 HMGP Project.
Lead Agency/Department Responsible:	County Engineer
Implementation Schedule:	Within 24-36 months of plan adoption
Incorporation into Existing Plans:	Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

	Bastrop County – Action #25
Proposed Action:	Upgrade flow capacity at Shiloh Road Bridge West of State Hwy 304. H&H Study needed as well as retaining an engineer to design a new structure and hire a contractor to install said improvements
BACKGROUND INFORMATION	
Site and Location:	Shiloh Road Bridge West of State Hwy 304
Risk Reduction Benefit (Current Cost/Losses Avoided):	Improve drainage capacity. Reduce risk to property and loss of life.
Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000+
Potential Funding Sources:	GLO CBDG DR-2017 Floods – Contract 20-065-139-C517
Lead Agency/Department Responsible:	County Engineer, Road and Bridge Precinct/Department
Implementation Schedule:	Within 24-36 months of plan adoption
Incorporation into Existing Plans:	Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

		Bastrop County – Action #26
	Proposed Action:	Design and Implement Drainage System Improvements to the Tahitian Village Subdivision. Secure professional engineer to perform an H&H study and design improvements to reduce the impacts of flooding within the subdivision.
	BACKGROUND INFORMATION	
	Site and Location:	Tahitian Village Subdivision
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Improve drainage capacity. Reduce risk to property and loss of life.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000+
Potential Funding Sources:	DR-4272 HMGP Project
Lead Agency/Department Responsible:	Road and Bridge Precinct/Department
Implementation Schedule:	Within 36-60 months of plan adoption
Incorporation into Existing Plans:	Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

		Bastrop County – Action #27
	Proposed Action:	Design and Implement Drainage System improvements. Perform an H&H study and recommend and implement drainage improvements in the Bluebonnet Acres Subdivision on Lakeview Dr. and Tuck Street.
	BACKGROUND INFORMATION	
	Site and Location:	Bluebonnet Acres Subdivision on Lakeview Dr. and Tuck St.
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Improve drainage capacity. Reduce risk to property and loss of life.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000+
Potential Funding Sources:	GLO-MIT Supplemental HMPG Funding Program
Lead Agency/Department Responsible:	Road and Bridge Precinct/Department
Implementation Schedule:	Within 24-36 months of plan adoption
Incorporation into Existing Plans:	Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

	Bastrop County – Action #28
Proposed Action:	Design and Implement Drainage System improvements to Big Bow Spillway. Implement improvements to approximately 100 LF of existing drainage channel to eliminate erosion to the Big Bow Spillway to avoid damage downstream.
BACKGROUND INFORMATION	
Site and Location:	Big Bow Spillway
Risk Reduction Benefit (Current Cost/Losses Avoided):	Improve drainage capacity. Reduce risk to property and loss of life.
Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000+
Potential Funding Sources:	GLO CDBG DR2017 Floods – Contract 20-065-139-C527
Lead Agency/Department Responsible:	Road and Bridge Precinct/Department
Implementation Schedule:	Within 24-36 months of plan adoption
Incorporation into Existing Plans:	Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

	Bastrop County – Action #29
Proposed Action:	Upgrade low water crossing to include a cast-in-place, box culvert-bridge.
BACKGROUND INFORMATION	
Site and Location:	1. Old Sayers Road and Big Sandy Creek 2. Meduna Road and Barton Oaks Draw 1 3. Marlin Road and Paint Creek Draw 4. Old Sayers Road and Little Sandy Creek
Risk Reduction Benefit (Current Cost/Losses Avoided):	Improve drainage capacity; Reduce risk to property and loss of life.
Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000 per site location
Potential Funding Sources:	Local, State, Federal funds, Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct/Department
Implementation Schedule:	Within 36-60 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

		Bastrop County – Action #30
	Proposed Action:	Upgrade low water crossings to cast-in-place multi-box culvert bridges.
	BACKGROUND INFORMATION	
	Site and Location:	100 Blocks of Friendship Road
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Improve drainage capacity; Reduce risk to property and loss of life.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000 - $500,000
Potential Funding Sources:	Local, State, Federal funds, Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct/Department
Implementation Schedule:	Within 36-60 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

	Bastrop County – Action #31
Proposed Action:	Upgrade low water crossings to cast-in-place multi-box culvert bridges.
BACKGROUND INFORMATION	
Site and Location:	200 Blocks of Friendship Road
Risk Reduction Benefit (Current Cost/Losses Avoided):	Improve drainage capacity; Reduce risk to property and loss of life.
Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000 - $500,000
Potential Funding Sources:	Local, State, Federal funds, Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct/Department
Implementation Schedule:	Within 36-60 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

	Bastrop County – Action #32
Proposed Action:	Upgrade low water crossings to cast-in-place multi-box culvert bridges.
BACKGROUND INFORMATION	
Site and Location:	400 Block of St. Delight to Pin Oak Creek
Risk Reduction Benefit (Current Cost/Losses Avoided):	Improve drainage capacity; Reduce risk to property and loss of life.
Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000 - $500,000
Potential Funding Sources:	Local, State, Federal funds, Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct/Department
Implementation Schedule:	Within 36-60 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

		Bastrop County – Action #33
	Proposed Action:	Upgrade 5-foot CMP to include cast-in-place, multi-box culvert-bridge.
	BACKGROUND INFORMATION	
	Site and Location:	Paffen Road and Grassy Creek Draw
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Improve drainage capacity; Reduce risk to property and loss of life.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000 - $500,000
Potential Funding Sources:	Local, State, Federal funds, Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct/Department
Implementation Schedule:	Within 36-60 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

		Bastrop County – Action #34
	Proposed Action:	Upgrade low water crossings to box culvert and widen roadway to allow for ditches and drainage.
	BACKGROUND INFORMATION	
	Site and Location:	Buckner's Creek crosses Hellinger Road (700 block)
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Improve drainage capacity; Reduce risk to property and loss of life.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000 - $500,000
Potential Funding Sources:	Local, State, Federal funds, Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct/Department
Implementation Schedule:	Within 36-60 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

	Bastrop County – Action #35
Proposed Action:	Replace existing undersized drainage structures with larger structures as specified in the TWDB Flood Protection Fund Study of the Alum Creek Watershed.
BACKGROUND INFORMATION	
Site and Location:	700 Block of Cardinal Drive at Alum Creek
Risk Reduction Benefit (Current Cost/Losses Avoided):	Improve drainage capacity; Reduce risk to property and loss of life.
Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000 - $500,000
Potential Funding Sources:	Local, State, Federal funds, Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct/Department
Implementation Schedule:	Within 36-60 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

		Bastrop County – Action #36
	Proposed Action:	Add bank/slope protection and repair erosion.
	BACKGROUND INFORMATION	
	Site and Location:	100 Block of Karisch Road at Pin Oak Creek
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Reduce risk to property and loss of life.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000 - $500,000
Potential Funding Sources:	Local, State, Federal funds, Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct/Department
Implementation Schedule:	Within 36-60 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

		Bastrop County – Action #37
	Proposed Action:	County roadway erosion control by repairing and upgrading culverts and drainage ditches as necessary.
	BACKGROUND INFORMATION	
	Site and Location:	County-wide project
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Reduce risk to property and loss of life.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000
Potential Funding Sources:	Local, State, Federal funds, Grants
Lead Agency/Department Responsible:	Road and Bridge Precinct/Department
Implementation Schedule:	Within 24-36 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

		Bastrop County – Action #38
	Proposed Action:	Conduct voluntary buyout of homes in the 100-year floodplain and turn the land into deed restricted open space.
	BACKGROUND INFORMATION	
	Site and Location:	Water's Edge Terrace Subdivision- Approximately 12 homes
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Reduce risk to property and loss of life.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project, Natural Systems Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$500,000+
Potential Funding Sources:	Local, State, Federal funds, Grants
Lead Agency/Department Responsible:	Floodplain Administrator/Coordinator
Implementation Schedule:	Within 36-60 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	Flood Mitigation Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Allocates areas for flood mitigation and increases public safety.

		Bastrop County – Action #39
	Proposed Action:	Provide funding to homeowners experiencing repetitive loss due to flooding to elevate their homes and reduce the risk of future damage.
	BACKGROUND INFORMATION	
	Site and Location:	Repetitive Loss properties within Bastrop County
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Reduce risk to property and loss of life.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000+
Potential Funding Sources:	Local, State, Federal funds, Grants
Lead Agency/Department Responsible:	Floodplain Administrator/Coordinator, County Engineer
Implementation Schedule:	Within 36-60 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	Flood Mitigation Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Allocates for flood mitigation and increases public safety.

		Bastrop County – Action #40
	Proposed Action:	Design and Implement Improvements at the Clear Springs Lake Dam. Retain the services of an engineer to analyze and design/ implement the necessary improvements.
	BACKGROUND INFORMATION	
	Site and Location:	Clear Springs Lake Dam
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Reduce risk to property and loss of life.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$500,000+
Potential Funding Sources:	Local, State, Federal funds, Grants, Texas Water Development Board
Lead Agency/Department Responsible:	County Engineer, Legal Department, TCEQ
Implementation Schedule:	Within 36-60 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	EAP

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

	Bastrop County – Action #41
Proposed Action:	TWDB FIS Study: Procure the assistance of professional engineering firm to continue the H&H Study work in designated special flood hazard areas and outside designated areas to determine updated special flood hazard areas.
BACKGROUND INFORMATION	
Site and Location:	Various watersheds in Bastrop County
Risk Reduction Benefit (Current Cost/Losses Avoided):	Reduce risk to property and loss of life.
Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000 - $500,000
Potential Funding Sources:	Local, State, Federal funds, Grants, Texas Water Development Board
Lead Agency/Department Responsible:	Floodplain Administrator/Coordinator
Implementation Schedule:	Within 24-36 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	Flood Study

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

		Bastrop County – Action #42
	Proposed Action:	Conduct a study and prioritize/implement projects to address numerous flood prone locations.
	BACKGROUND INFORMATION	
	Site and Location:	County-wide project
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Reduce risk to property and loss of life.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000
Potential Funding Sources:	Local, State, Federal funds, Grants
Lead Agency/Department Responsible:	County Engineer, Road and Bridge Precinct/Department
Implementation Schedule:	Within 36-60 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects communities and reduces risk of flooding.

		Bastrop County – Action #43
	Proposed Action:	Reduce the available vegetative fuels in areas prone to wildland fire to reduce the risk to urban interfaces.
	BACKGROUND INFORMATION	
	Site and Location:	County-wide project
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Reduce risk to property and loss of life.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000 - $500,000
Potential Funding Sources:	Local, State, Federal funds, Grants
Lead Agency/Department Responsible:	Lost Pines Habitat Conservation Plan
Implementation Schedule:	Within 36-60 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	CWPP

COMMENTS:

		Bastrop County – Action #44
	Proposed Action:	Expansive soils analysis on county buildings to determine if expansive soils problems exist around foundations.
	BACKGROUND INFORMATION	
	Site and Location:	County-wide project
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Reduce risk to property and loss of life.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Expansive Soils
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$10,000- $100,000
Potential Funding Sources:	Local, State, Federal funds, Grants, CIP funding, Bonds
Lead Agency/Department Responsible:	County Engineer
Implementation Schedule:	Within 24 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	N/A

COMMENTS:

		Bastrop County – Action #45
	Proposed Action:	Monitor existing county structures and take action as necessary which may include watering slabs and foundations, installing subgrade irrigation systems, and performing expansive soil construction techniques to prevent more structural damage
	BACKGROUND INFORMATION	
	Site and Location:	County-wide project
	Risk Reduction Benefit (Current Cost/Losses Avoided):	Reduce risk to property and loss of life.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project, Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Expansive Soils
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$10,000
Potential Funding Sources:	Local, State, Federal funds, Grants, CIP funding, Bonds
Lead Agency/Department Responsible:	Road and Bridge Precinct/Department
Implementation Schedule:	Within 36 months of plan adoption, or upon available funding
Incorporation into Existing Plans:	N/A

COMMENTS:

CITY OF BASTROP

	City of Bastrop– Action #1
Proposed Action:	Install community-wide broadband and fiber to premises to enhance connectivity and security during a natural disaster and during recovery phases.
BACKGROUND INFORMATION	
Site and Location:	City of Bastrop
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce loss of life. Increase communication within the community.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness, Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Earthquakes, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Wildfire, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Health and Medical, Communications
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000 +
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	Bastrop Power and Light
Implementation Schedule:	Within 5 years of plan adoption
Incorporation into Existing Plans:	Broadband Feasibility Study

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
A large number of city systems are dependent on connectivity to the internet. A loss of internet could result in multiple failures to public utilities that could impact health and safety.

		City of Bastrop– Action #2
	Proposed Action:	Install additional bridges over the Colorado River in accordance with City and County transportation plans.
	BACKGROUND INFORMATION	
	Site and Location:	City of Bastrop
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Improve and create additional evacuation routes. Reduce loss of life.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Earthquakes, Flood, Hurricane/Tropical Storm, Thunderstorm Wind, Wildfire, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Security/Safety, Health and Medical
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000 +
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	City of Bastrop Engineering
Implementation Schedule:	Within 5 years of plan adoption
Incorporation into Existing Plans:	Transportation Plan; Emergency Response Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Increase public safety.

		City of Bastrop– Action #3
	Proposed Action:	Copperas Creek Drainage Improvements.
	BACKGROUND INFORMATION	
	Site and Location:	City of Bastrop
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Improve drainage capability. Reduce risk to property and loss of life.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Flood, Hurricane/Tropical Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structure and infrastructure
Priority (High, Moderate, Low):	Low
Estimated Cost:	$100,000+
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	City of Bastrop Engineering
Implementation Schedule:	Within 5 years of plan adoption
Incorporation into Existing Plans:	Master Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
This will be part of implementing the drainage master plan proposed capital improvements and would require Interlocal Agreements with Bastrop County.

	City of Bastrop– Action #4
Proposed Action:	Gills Branch Drainage Improvements.
BACKGROUND INFORMATION	
Site and Location:	City of Bastrop
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Improve drainage capability. Reduce risk to property and loss of life.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Flood, Hurricane/Tropical Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structure and infrastructure
Priority (High, Moderate, Low):	Low
Estimated Cost:	$100,000+
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	City of Bastrop Engineering
Implementation Schedule:	Within 5 years of plan adoption
Incorporation into Existing Plans:	Master Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
This will be part of implementing the drainage master plan proposed capital improvements and would require Interlocal Agreements with Bastrop County.

		City of Bastrop– Action #5
	Proposed Action:	Pine Forest Creek Drainage Improvements.
	BACKGROUND INFORMATION	
	Site and Location:	City of Bastrop
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Improve drainage capability. Reduce risk to property and loss of life.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Flood, Hurricane/Tropical Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structure and infrastructure
Priority (High, Moderate, Low):	Low
Estimated Cost:	$100,000+
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	City of Bastrop Engineering
Implementation Schedule:	Within 5 years of plan adoption
Incorporation into Existing Plans:	Master Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
This will be part of implementing the drainage master plan proposed capital improvements and would require Interlocal Agreements with Bastrop County.

	City of Bastrop– Action #6
Proposed Action:	Spring Branch Creek Drainage Improvements.
BACKGROUND INFORMATION	
Site and Location:	City of Bastrop
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Improve drainage capability. Reduce risk to property and loss of life.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Flood, Hurricane/Tropical Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structure and infrastructure
Priority (High, Moderate, Low):	Low
Estimated Cost:	$100,000+
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	City of Bastrop Engineering
Implementation Schedule:	Within 5 years of plan adoption
Incorporation into Existing Plans:	Master Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
This will be part of implementing the drainage master plan proposed capital improvements and would require Interlocal Agreements with Bastrop County.

	City of Bastrop– Action #7
Proposed Action:	Identify finished floor elevations for structures within the regulated flood hazard area. This will allow for better understanding of flood risk for existing structures and potential for increased compliance with flood damage prevention ordinances.
BACKGROUND INFORMATION	
Site and Location:	City of Bastrop flood hazard area
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to property and loss of life.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulation

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000+
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	City of Bastrop Engineering
Implementation Schedule:	Within “x” month(s) or year(s) of plan adoption
Incorporation into Existing Plans:	Local Building Code

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
NFIP Compliance - The community is required to maintain “finished-construction” Elevation Certificates and all other required floodplain-related construction certificates (see Section 301.b) on all buildings in the community’s Special Flood Hazard Area (SFHA) that are constructed, substantially improved, and/or reconstructed. While this will not provide construction certificates via an Elevation Certificate, a greater understanding of structures with increased risk of damage is obtained.

	City of Bastrop– Action #8
Proposed Action:	Early flood warning / Flood Gauges. Upgrade and add new public safety infrastructure. The City would fund a study to identify the needs and placement of new facilities. Also identify the existing facility needs and upgrades. The study would identify the estimated cost for the future.
BACKGROUND INFORMATION	
Site and Location:	City of Bastrop
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to property and loss of life. Better coverage, location, and additional space for current facilities and new facilities.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project, Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Flood, Hurricane/Tropical Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structure and infrastructure
Priority (High, Moderate, Low):	High
Estimated Cost:	$50,000+
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	City of Bastrop Emergency Management Department
Implementation Schedule:	Within 24 months of plan adoption
Incorporation into Existing Plans:	Flood Study; Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

		City of Bastrop– Action #9
	Proposed Action:	Prepare for Civil Unrest to protect life and property. Develop a probability model of areas of concern via social media would provide the PD and EM a barometer for anticipating potential community conflicts. Enhance security with cameras.
	BACKGROUND INFORMATION	
	Site and Location:	City of Bastrop
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to property and loss of life.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Preparedness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Preparedness
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$10,000
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	City of Bastrop Police Department and Emergency Management
Implementation Schedule:	Within 1 year of plan adoption
Incorporation into Existing Plans:	Police Department Policy / Manual

COMMENTS:

		City of Bastrop– Action #10
	Proposed Action:	Mitigate Electric Power lines: Install metal poles on major feeders and distribution line and bury electrical lines underground to minimize damage to poles and end electrical power outages from hazard events.
	BACKGROUND INFORMATION	
	Site and Location:	City of Bastrop
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to property and loss of life. Ensure continuation of services.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Earthquakes, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Wildfire, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structures and infrastructure
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000+
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	Bastrop Power and Light
Implementation Schedule:	Within 5 years of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

	City of Bastrop– Action #11
Proposed Action:	Purchase back-up powered generators. Purchase and install back-up power generators at Fire Station # 1, City Hall, and Waste Water Facility, in order to allow for use as warming stations, employee quarters, public safety staging of personnel and equipment.
BACKGROUND INFORMATION	
Site and Location:	City of Bastrop Fire Station # 1, City Hall, and Waste Water Facility
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Increase the availability of facilities during power outages. Reduce loss of life. Ensure continuation of critical services.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Earthquakes, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Wildfire, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000+
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	City of Bastrop Public Works
Implementation Schedule:	Within 5 years of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Helps ensure critical facilities continue to provide services during a power outage caused by unforeseen events.

	City of Bastrop– Action #12
Proposed Action:	Harden Public Buildings (see comments)
BACKGROUND INFORMATION	
Site and Location:	City of Bastrop
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to property and loss of life.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Earthquakes, Flood, Extreme Heat, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Wildfire, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structure and infrastructure
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$100,000+
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	City of Bastrop Public Works / Building Maintenance
Implementation Schedule:	Within 5 years of plan adoption
Incorporation into Existing Plans:	Comprehensive Plan; Hazard Mitigation Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Existing City Buildings would be used as a shelter to the public and staff and be hardened by the use of (tornado, wind, fire, hail, ground movement, and impact resistant materials). Doors, windows, roofing, construction siding, roof bracing); dry proofing buildings; upgrading higher standard insulation installing lightning rods and grounding systems; retrofitting low flow plumbing; and drought resistant landscape.

		City of Bastrop– Action #13
	Proposed Action:	Public Education for homeowners. Educate homeowners on how to mitigate their homes from all hazards through the distribution of pamphlets, flyers, and social media.
	BACKGROUND INFORMATION	
	Site and Location:	City of Bastrop
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to property and loss of life.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Drought, Earthquakes, Flood, Expansive Soils, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Wildfire, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Communication
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$10,000 to $100,000
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	City of Bastrop Emergency Management Department
Implementation Schedule:	Within 5 years of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

	City of Bastrop– Action #14
Proposed Action:	Purchase NOAA Radios and distribute to residents.
BACKGROUND INFORMATION	
Site and Location:	City of Bastrop
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to residents and loss of life through improved communications and early warning.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Earthquakes, Flood, Extreme Heat, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Wildfire, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Communication
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$10,000 to $50,000
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	City of Bastrop Emergency Management Department
Implementation Schedule:	Within 3-5 years of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Prevents injury to residents.

	City of Bastrop– Action #15
Proposed Action:	Wildfire mitigation: Increase the awareness and mitigation to wildfires. Participate in wildfire mitigation through planning and education. Partnerships with County and State resources to establish relationships to offer programs to build capacity for natural resource management and wildfire mitigation within the community.
BACKGROUND INFORMATION	
Site and Location:	City of Bastrop and ETJ areas
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce loss of property and life.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness, Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Communication
Effect on new/existing buildings:	Reduce risk to new and existing structure and infrastructure
Priority (High, Moderate, Low):	High
Estimated Cost:	$10,000
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	City of Bastrop Emergency Management Department
Implementation Schedule:	Within 5 years of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:

	City of Bastrop– Action #16
Proposed Action:	Public Safety Facilities: Upgrade and add new hardened public safety infrastructure. The City would fund a study to identify the needs and placement of new facilities. Also identify the existing facility needs and upgrades. The study would identify the estimated cost for the future.
BACKGROUND INFORMATION	
Site and Location:	City of Bastrop
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce loss of property and life.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Drought, Earthquakes, Flood, Expansive Soils, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Wildfire, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000+
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	City of Bastrop Emergency Management Department
Implementation Schedule:	Within 5 years of plan adoption
Incorporation into Existing Plans:	Comprehensive Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

CITY OF ELGIN

		City of Elgin– Action #1
	Proposed Action:	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of all hazards that can threaten the area.
	BACKGROUND INFORMATION	
	Site and Location:	City of Elgin
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to property, injury and loss of life.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Earthquake, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm, Pipeline Failure, Infectious Disease
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Health/Medical, and Communication
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$5,000
Potential Funding Sources:	Local, State and Federal funds
Lead Agency/Department Responsible:	City of Elgin Police Department, Public Information Office
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

		City of Elgin– Action #2
	Proposed Action:	Evaluate access and road conditions for response vehicles and formulate/implement options to improve access and/or add redundant access routes in high-risk areas. Implement findings.
	BACKGROUND INFORMATION	
	Site and Location:	City of Elgin
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to property, injury and loss of life.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project, Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Wildfire, Pipeline Failure
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structures and infrastructure
Priority (High, Moderate, Low):	High
Estimated Cost:	$250,000
Potential Funding Sources:	Local, State and Federal funds
Lead Agency/Department Responsible:	City of Elgin Police Department
Implementation Schedule:	Within 24-36 months of plan adoption
Incorporation into Existing Plans:	Local Building Codes/Ordinances; Capital Improvement Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protect infrastructure and increases public safety.

		City of Elgin– Action #3
	Proposed Action:	Prohibit animal shelters in known hazard areas.
	BACKGROUND INFORMATION	
	Site and Location:	Future City owned Animal Shelter
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to structures and animals by requiring development outside of hazardous areas; Reduce burden to emergency response during hazardous events.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Wildfire, Hurricane/Tropical Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new structures and infrastructure
Priority (High, Moderate, Low):	High
Estimated Cost:	$2,500
Potential Funding Sources:	Local Funds (staff time)
Lead Agency/Department Responsible:	City of Elgin Public Works
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	Local Building Codes/Ordinances

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protect infrastructure and increases public safety.

		City of Elgin– Action #4
	Proposed Action:	Require new construction / development projects to have landscape irrigation systems.
	BACKGROUND INFORMATION	
	Site and Location:	City-wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to property and loss of life.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Drought
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new structures and infrastructure
Priority (High, Moderate, Low):	Low
Estimated Cost:	$5,000+ (varies by size of project)
Potential Funding Sources:	Local funds
Lead Agency/Department Responsible:	City of Elgin Planning and Development
Implementation Schedule:	Within 24-36 months of plan adoption
Incorporation into Existing Plans:	Local Building Codes/Ordinances

COMMENTS:

		City of Elgin– Action #5
	Proposed Action:	Install irrigation systems and implement watering schedule at public buildings and critical facilities.
	BACKGROUND INFORMATION	
	Site and Location:	City Facilities: City Hall, Public Works, Police Station, Library, Recreation Center(s), Water wells and treatment plants
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to property and loss of life.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project, Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Drought, Expansive Soils
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new structures and infrastructure
Priority (High, Moderate, Low):	Low
Estimated Cost:	$5,000 + per site location (varies by size of project)
Potential Funding Sources:	Local, State and Federal funds
Lead Agency/Department Responsible:	City of Elgin Public Works
Implementation Schedule:	Within 24-36 months of plan adoption
Incorporation into Existing Plans:	Local Building Codes/Ordinances

COMMENTS:

		City of Elgin– Action #6
	Proposed Action:	Hire IT specialist to monitor and maintain security software for City equipment and websites.
	BACKGROUND INFORMATION	
	Site and Location:	City of Elgin
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to system failure and loss of data. Reduce risk of personal information being released.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Preparedness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Cyber Attack
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$75,000 (annually)
Potential Funding Sources:	Local, State and Federal funds
Lead Agency/Department Responsible:	City of Elgin Human Resources
Implementation Schedule:	Within 12 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:

		City of Elgin– Action #7
	Proposed Action:	Mandatory training for employees to keep computer systems locked when not in use, staying alert for phishing scams, and suspicious emails with attachments.
	BACKGROUND INFORMATION	
	Site and Location:	City of Elgin
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to system failure and loss of data. Reduce risk of personal information being released.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness, Preparedness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Cyber Attack
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Communication
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$2,500
Potential Funding Sources:	Local funds (staff time)
Lead Agency/Department Responsible:	City of Elgin Human Resources
Implementation Schedule:	Within 12 months of plan adoption
Incorporation into Existing Plans:	SOP

COMMENTS:

		City of Elgin– Action #8
	Proposed Action:	Work with Texas Department of Transportation to create a Truck Route and prohibit trucks from traveling through the middle of the City.
	BACKGROUND INFORMATION	
	Site and Location:	City Facilities: City Hall, Public Works, Police Station, Library, Recreation Center(s), Water wells and treatment plants
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to property, injury and loss of life.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations, Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Material Release
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structures and infrastructure
Priority (High, Moderate, Low):	High
Estimated Cost:	$10,000,000
Potential Funding Sources:	Local, State and Federal funds
Lead Agency/Department Responsible:	City of Elgin Police Department, Texas DOT
Implementation Schedule:	Within 12-36 months of plan adoption
Incorporation into Existing Plans:	Local Ordinance

COMMENTS:

		City of Elgin– Action #9
	Proposed Action:	Enforce Truck Route by providing first issuing warnings, then citations.
	BACKGROUND INFORMATION	
	Site and Location:	City of Elgin
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to property, injury and loss of life.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Material Release
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Communication
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,000+ annually
Potential Funding Sources:	Local funds (staff time)
Lead Agency/Department Responsible:	City of Elgin Police Department, Texas DOT
Implementation Schedule:	Within 12-36 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:

		City of Elgin– Action #10
	Proposed Action:	Acquire and install emergency generators with hard wired quick connections at critical facilities.
	BACKGROUND INFORMATION	
	Site and Location:	City of Elgin critical facilities
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Provide power for critical facilities during power outages and ensure continuity of critical services.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Earthquake, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,000,000
Potential Funding Sources:	Local, State and Federal funds
Lead Agency/Department Responsible:	City of Elgin Planning and Development
Implementation Schedule:	Within 12-36 months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Enables safe and fast connection to electrical system.

CITY OF SMITHVILLE

	City of Smithville - Action #1
Proposed Action:	Re-furbish ground and elevated water storage tanks to ensure availability and reliability of fire suppression system as it relates to fire flow. Operating pressure is 52-55 psi for fire flow. Work to be funded by Certificate of Obligation.
BACKGROUND INFORMATION	
Site and Location:	Community wide
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Emergency preparedness, public safety, and loss avoidance
Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$2.5M
Potential Funding Sources:	Local Funds (C of O)
Lead Agency/Department Responsible:	City of Smithville Public Works
Implementation Schedule:	Within 12-months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
C of O - Certificate of Obligation

	City of Smithville - Action #2
Proposed Action:	Implement wildfire public awareness campaign with emphasis on emergency preparedness / prevention. Communicate issuance of County-wide burn ban(s) via social media outlets (FB, Nextdoor, City Website, Digital Billboards, etc.).
BACKGROUND INFORMATION	
Site and Location:	Community wide
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Emergency preparedness, public safety, and loss avoidance
Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Communication
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000
Potential Funding Sources:	Local Funds (C of O)
Lead Agency/Department Responsible:	City of Smithville Fire Chief
Implementation Schedule:	Within 12-months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
C of O - Certificate of Obligation

		City of Smithville – Action #3
	Proposed Action:	Re-furbish ground and elevated water storage tanks to ensure availability and quality of community drinking water system. Current water storage capacity is 1.6 million gallons. Work to be funded by Certificate of Obligation.
	BACKGROUND INFORMATION	
	Site and Location:	Community wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Emergency preparedness, public safety, and loss avoidance
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$2.5M
Potential Funding Sources:	Local Funds (C of O)
Lead Agency/Department Responsible:	City of Smithville Public Works
Implementation Schedule:	Within 24-months of plan adoption
Incorporation into Existing Plans:	Drought Contingency Plan

COMMENTS:
C of O - Certificate of Obligation

		City of Smithville– Action #4
	Proposed Action:	Update City of Smithville Drought Contingency Plan. Publish updated drought contingency plan and communicate water conservation techniques / methods to the community.
	BACKGROUND INFORMATION	
	Site and Location:	Community wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Emergency preparedness, public safety, and loss avoidance
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Education and Awareness, Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Communication
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$2.5M
Potential Funding Sources:	Local Funds (C of O)
Lead Agency/Department Responsible:	City of Smithville Administration
Implementation Schedule:	Within 24-months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
C of O - Certificate of Obligation

		City of Smithville – Action #5
	Proposed Action:	Early warning and communication of upstream dam / levee failure events in an effort to identify low water crossings and/or areas within city limit and/or ETJ where flooding is likely and/or prominent.
	BACKGROUND INFORMATION	
	Site and Location:	Community wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Emergency preparedness, public safety, and loss avoidance
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Communication
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Low
Estimated Cost:	<$1,000 - Staff time
Potential Funding Sources:	Local funds
Lead Agency/Department Responsible:	City of Smithville EMC
Implementation Schedule:	As needed based on dam failure events
Incorporation into Existing Plans:	EAP

COMMENTS:

		City of Smithville – Action #6
	Proposed Action:	Communicate extreme heat-related weather warnings via social media and digital billboards. Educate the community regarding health signs, symptoms, and risks of heat exhaustion and heat stroke.
	BACKGROUND INFORMATION	
	Site and Location:	Community-wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Emergency preparedness, public safety, and loss avoidance
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Extreme Heat
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Communication, Health/Medical
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	< $10k
Potential Funding Sources:	Local Funds
Lead Agency/Department Responsible:	City of Smithville EMC
Implementation Schedule:	Within 12-months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:

		City of Smithville – Action #7
	Proposed Action:	Establish cooling centers and/or distribute bottled water from city-owned community center.
	BACKGROUND INFORMATION	
	Site and Location:	Community-wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Emergency preparedness, public safety, and loss avoidance
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Extreme Heat
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	< $10k
Potential Funding Sources:	Local Funds
Lead Agency/Department Responsible:	City of Smithville Administration
Implementation Schedule:	Within 12-months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:

		City of Smithville – Action #8
	Proposed Action:	Develop / update community shelter protocols and procedures for the Smithville Recreation Center to house anyone displaced by an earthquake. Communicate potential risks associated with earthquakes and availability of community shelters.
	BACKGROUND INFORMATION	
	Site and Location:	Community-wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Emergency preparedness, public safety, and loss avoidance
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Local Plans and Regulations, Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Earthquake
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Communication
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	< $5k
Potential Funding Sources:	Local Funds
Lead Agency/Department Responsible:	City of Smithville EMC
Implementation Schedule:	Within 24-months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:

		City of Smithville – Action #9
	Proposed Action:	Communicate flash flood-related watches and warnings via social media and/or digital billboard. Educate the community about risks associated with flash flooding of low-water crossings.
	BACKGROUND INFORMATION	
	Site and Location:	Community-wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Emergency preparedness, public safety, and loss avoidance
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storms
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Communication
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$10,000
Potential Funding Sources:	Local, State and Federal Funds, Grants
Lead Agency/Department Responsible:	City of Smithville Administration
Implementation Schedule:	Within 60-months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

		City of Smithville – Action #10
	Proposed Action:	Implement flood mitigation projects that reduce and/or eliminate the potential for flooding.
	BACKGROUND INFORMATION	
	Site and Location:	Community-wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Emergency preparedness, public safety, and loss avoidance
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$13M
Potential Funding Sources:	Local, State and Federal funds, Grants
Lead Agency/Department Responsible:	City of Smithville Public Works
Implementation Schedule:	Within 60-months of plan adoption
Incorporation into Existing Plans:	Drainage Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

	City of Smithville – Action #11
Proposed Action:	The scope of work includes upgrading the existing storm sewer system along NE/NW 2nd Street from Gresham Street to SH-95. The scope of work also includes re constructing the existing streets to properly drain to the improved system. These improvements will help mitigate the risk of stormwater flooding existing businesses, residences, and streets in the downtown area.
BACKGROUND INFORMATION	
Site and Location:	NE / NW 2nd Street from Gresham to Hwy 95 Drainage Improvement
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Emergency preparedness, public safety, and loss avoidance
Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,752,500
Potential Funding Sources:	GLO / FEMA
Lead Agency/Department Responsible:	City of Smithville Public Works
Implementation Schedule:	Within 12 months of plan adoption
Incorporation into Existing Plans:	Drainage Improvement Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Manages floodwater to reduce flooding, repair damaged infrastructure, and provides a more adequate place for flow.

	City of Smithville – Action #12	
	Proposed Action:	The scope of work includes constructing a regional detention pond at the east end of Martin Luther King Drive and SE 4th Street and building a new storm sewer system to the proposed pond along SE 4th Street, Martin Luther King Drive, Bunte Street, SE 2nd Street, and Gentry Street. These improvements will help mitigate the risk of stormwater flooding the adjoining neighborhood and existing city streets.
	BACKGROUND INFORMATION	
	Site and Location:	SE 4th Regional Detention Pond
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Emergency preparedness, public safety, and loss avoidance
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$5,388,250
Potential Funding Sources:	GLO / FEMA
Lead Agency/Department Responsible:	City of Smithville Public Works
Implementation Schedule:	Within 24 months of plan adoption
Incorporation into Existing Plans:	Drainage Improvement Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Manages floodwater to reduce flooding, repair damaged infrastructure, and provides a more adequate place for flow.

	City of Smithville – Action #13
Proposed Action:	The scope of work includes extending the existing storm sewer system from Short and NE 5th Streets east to Garwood Street. From Garwood and NE 5th Streets, the storm sewer would then be extended north along Garwood to NE 6th Street and then east to Bishop Street. From Garwood and NE 5th Streets, the storm sewer would also be extended south along Garwood to NE 4th Street and then east to Turney Street. Finally, this part would include enlarging the existing storm sewer line along Byrne Street from NE 5th to NE 6th Street. These improvements will help mitigate the risk of stormwater flooding the existing residential neighborhoods within and near this area.
BACKGROUND INFORMATION	
Site and Location:	6th Street Drainage Improvements
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Emergency preparedness, public safety, and loss avoidance
Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structures.
Priority (High, Moderate, Low):	High
Estimated Cost:	$786,350
Potential Funding Sources:	GLO / FEMA
Lead Agency/Department Responsible:	City of Smithville Public Works
Implementation Schedule:	Within 36 months of plan adoption
Incorporation into Existing Plans:	Drainage Improvement Plan

COMMENTS:

CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Manages floodwater to reduce flooding, repair damaged infrastructure, and provides a more adequate place for flow.

	City of Smithville – Action #14
Proposed Action:	The scope of work includes constructing a regional detention pond adjacent and to the north of railroad right-of-way south of Loop 230 and approximately 2,000 linear feet southeast of the intersection of McSweeney Street and NE 1st Street. It also includes constructing a new storm sewer system from the proposed pond north to Loop 230, east to Faulkner Road, north to Oak Meadows Drive, and east to Lueders Lane. These improvements will help mitigate the risk of stormwater flooding the adjoining neighborhoods north and west of the proposed pond.
BACKGROUND INFORMATION	
Site and Location:	Loop 230 Regional Detention Pond
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Emergency preparedness, public safety, and loss avoidance
Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structures.
Priority (High, Moderate, Low):	High
Estimated Cost:	$2,618,500
Potential Funding Sources:	GLO / FEMA
Lead Agency/Department Responsible:	City of Smithville Public Works
Implementation Schedule:	Within 36-48 months of plan adoption
Incorporation into Existing Plans:	Drainage Improvement Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Manages floodwater to reduce flooding, repair damaged infrastructure, and provides a more adequate place for flow.

		City of Smithville – Action #15
	Proposed Action:	Communicate weather-related watches and warnings via social media and digital billboard.
	BACKGROUND INFORMATION	
	Site and Location:	Community-wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Emergency preparedness, public safety, and loss avoidance
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Communication
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$100-150k
Potential Funding Sources:	Local Funds
Lead Agency/Department Responsible:	City of Smithville Administration
Implementation Schedule:	Within 36-months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

	City of Smithville – Action #16
Proposed Action:	Implement routine tree trimming program that clears tree limbs near power lines and/or hanging in right-of-way.
BACKGROUND INFORMATION	
Site and Location:	Community-wide
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Emergency preparedness, public safety, and loss avoidance
Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hurricane/Tropical Storm, Hail, Thunderstorm Wind, Tornado, Lightning, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Energy
Effect on new/existing buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$100-150k
Potential Funding Sources:	Local Funds
Lead Agency/Department Responsible:	City of Smithville Public Works
Implementation Schedule:	Within 36-months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:

		City of Smithville – Action #17
	Proposed Action:	Require standards for underground electrical lines and other utilities in new developments.
	BACKGROUND INFORMATION	
	Site and Location:	Community-wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Emergency preparedness, public safety, and loss avoidance
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hurricane/Tropical Storm, Hail, Thunderstorm Wind, Tornado, Lightning, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Energy
Effect on new/existing buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$100-150k
Potential Funding Sources:	Local Funds
Lead Agency/Department Responsible:	City of Smithville Administration
Implementation Schedule:	Within 36-months of plan adoption
Incorporation into Existing Plans:	Local Ordinance/Building Codes

COMMENTS:

		City of Smithville – Action #18
	Proposed Action:	Identify all potential sources / carries of hazardous materials (e.g., roadway, rail). Train local volunteer fire department on procedures and protocols for responding to hazardous materials release. Provide copies of current Emergency Response Guide (ERG).
	BACKGROUND INFORMATION	
	Site and Location:	Community-wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Emergency preparedness, public safety, and loss avoidance
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Education and Awareness, Preparedness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Material Release
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Communication
Effect on new/existing buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	Low
Estimated Cost:	$5k
Potential Funding Sources:	Local Funds
Lead Agency/Department Responsible:	City of Smithville EMC
Implementation Schedule:	Within 36-months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:

		City of Smithville – Action #19
	Proposed Action:	Develop and implement “reverse 911” capability and notification procedures / protocols to alert residents that may need to be evacuated.
	BACKGROUND INFORMATION	
	Site and Location:	Community-wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Emergency preparedness, public safety, and loss avoidance
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Education and Awareness, Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Drought, Earthquake, Expansive Soils, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm, Hazardous Material Release
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Communication
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Low
Estimated Cost:	$5k
Potential Funding Sources:	Local Funds
Lead Agency/Department Responsible:	City of Smithville EMC
Implementation Schedule:	Within 36-months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

		City of Smithville – Action #20
	Proposed Action:	Implement cyber-security firewall protection for all city network systems and computer interfaces.
	BACKGROUND INFORMATION	
	Site and Location:	City Facilities / Network System
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Loss avoidance. Data integrity.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Cyber Attack
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$25-35k / year
Potential Funding Sources:	Local Funds
Lead Agency/Department Responsible:	City of Smithville Administration
Implementation Schedule:	Within 12-months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:

		City of Smithville – Action #21
	Proposed Action:	Educate city employees regarding potential threat from (and protective measures against) malware, cyber-attacks, and computer viruses.
	BACKGROUND INFORMATION	
	Site and Location:	City Facilities / Network System
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Loss avoidance. Data integrity.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Cyber Attack
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Communication
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$25-35k / year
Potential Funding Sources:	Local Funds
Lead Agency/Department Responsible:	City of Smithville Administration
Implementation Schedule:	Within 12-months of plan adoption
Incorporation into Existing Plans:	SOP

COMMENTS:

		City of Smithville – Action #22
	Proposed Action:	Communicate infectious disease warnings via social media and digital billboards. Educate the community regarding health risks and protective measures.
	BACKGROUND INFORMATION	
	Site and Location:	Community-wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Emergency preparedness, public safety, and loss avoidance
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Infectious Disease
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Health/Medical, Communication
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$25-50k
Potential Funding Sources:	Local Funds
Lead Agency/Department Responsible:	City of Smithville Administration
Implementation Schedule:	Within 24-months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:

		City of Smithville – Action #23
	Proposed Action:	Implement infectious disease testing centers and vaccination clinics to address pending health issue (e.g., pandemic, epidemic, seasonal flu).
	BACKGROUND INFORMATION	
	Site and Location:	Community-wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Emergency preparedness, public safety, and loss avoidance
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Infectious Disease
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Health/Medical
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$25-50k
Potential Funding Sources:	Local Funds
Lead Agency/Department Responsible:	City of Smithville EMC
Implementation Schedule:	Within 24-months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:

BASTROP INDEPENDENT SCHOOL DISTRICT (ISD)

	Bastrop ISD – Action # 1
Proposed Action:	Implement education and awareness program utilizing classrooms, social media, bulletins, flyers, etc. to educate students, parents and area residents of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages.
BACKGROUND INFORMATION	
Site and Location:	District-wide
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Promote hazard awareness and protect citizens from potential injuries and damages.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Drought, Extreme Heat, Expansive Soils, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm, Earthquake, Hurricane/Tropical Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$5,000
Potential Funding Sources:	District Funds (staff time), State and Federal Grants
Lead Agency/Department Responsible:	CFO or Director of Maintenance
Implementation Schedule:	Within 12 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

		Bastrop ISD – Action # 2
	Proposed Action:	Upgrade ISD campuses to include drought mitigation measures such as grey water reuse systems, drought tolerant landscaping, installation of a sprinkler system with regular watering schedule and installation of French drains where high plasticity soils are indicated.
	BACKGROUND INFORMATION	
	Site and Location:	Bastrop ISD campus facilities;
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Provide water for critical facilities during water outages and reduce water use.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Expansive Soils
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$100,000
Potential Funding Sources:	District Funds, State and Federal Grants
Lead Agency/Department Responsible:	CFO or Director of Maintenance
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:

		Bastrop ISD – Action #3
	Proposed Action:	Provide natural gas-powered generators to all campuses and 3 district facilities in the event of a sustained power outage. Include hardwired quick connections at all sites.
	BACKGROUND INFORMATION	
	Site and Location:	All school campuses (8 Elementary Schools, 4 middle schools, 3 high schools, 1 Alternative Education school, 1 IT facility, Transportation, and the Administration Offices.
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Continuity of services. Reduce cost to perishable food products estimated at $15,000 per campus or $285,000 district-wide.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Earthquake, Extreme Heat, Hail, Flood, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Energy (Power/Fuel), and Health/Medical
Effect on new/existing buildings:	Reduce risk to existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$75,000 per site ($1,425,000)
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	Bastrop ISD – Maintenance and Operations
Implementation Schedule:	Within 1 year of plan adoption.
Incorporation into Existing Plans:	Emergency Operations Plan

COMMENTS:
The district serves a student population of 71% who are on free or reduced lunch. Providing meals are essential to our community.
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Helps ensure critical facilities continue to provide services during a power outage cause by unforeseen events.

		Bastrop ISD – Action #4
	Proposed Action:	Installation of uninterruptible power supplies on public address and radio repeater systems to ensure communication during hazard events.
	BACKGROUND INFORMATION	
	Site and Location:	All school campuses (8 Elementary Schools, 4 middle schools, 3 high schools, 1 Alternative Education school, 1 IT facility, Transportation, and the Administration Offices.
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Maintain communication during short-term power outages. Promote hazard awareness and protect public from potential injuries and damages.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project, Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam/Levee Failure, Earthquake, Extreme Heat, Hail, Flood, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Communication
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,600 per site. $30,400 total for district.
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	Bastrop ISD – Technology
Implementation Schedule:	Within 1 year of plan adoption.
Incorporation into Existing Plans:	Emergency Operations Plan

COMMENTS:
Public address system incorporates emergency alerts for campuses. This is used in conjunction with the two-way radios during emergencies.
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

		Bastrop ISD – Action #5
	Proposed Action:	Construct fencing around campuses for security.
	BACKGROUND INFORMATION	
	Site and Location:	All school campuses (8 Elementary Schools, 4 middle schools, 3 high schools, and 1 Alternative Education school
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Prevent unauthorized person(s) from entering onto district property.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Preparedness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Preparedness
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Upgrades of existing and new buildings
Priority (High, Moderate, Low):	High
Estimated Cost:	$160,000 per site ($2,560,000)
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	Bastrop ISD – Maintenance and Operations
Implementation Schedule:	Within 1 year of plan adoption.
Incorporation into Existing Plans:	N/A

COMMENTS:
Fencing is needed due to district schools being spread over 433 square miles and the need to control access. Also, to limit younger students from leaving campus that are on busy highways and rural country roads.

		Bastrop ISD – Action #6
	Proposed Action:	Installation of IP Security Cameras throughout the district.
	BACKGROUND INFORMATION	
	Site and Location:	All school campuses (8 Elementary Schools, 4 middle schools, 3 high schools, 1 Alternative Education school, 1 IT facility, Transportation, and the Administration Offices.
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Prevention/deterrence of crime and school violence. Access and monitor exterior and interior of district buildings. Discourages vandalism and trespassing.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Preparedness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Preparedness
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	
Priority (High, Moderate, Low):	High
Estimated Cost:	$750,000 district-wide
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	Bastrop ISD – Technology
Implementation Schedule:	Within 1 year of plan adoption.
Incorporation into Existing Plans:	N/A

COMMENTS:
Security cameras not only help to prevent crime and identify potential suspects but provide a feeling of safety and security to faculty, students, staff, and visitors.

ELGIN INDEPENDENT SCHOOL DISTRICT (ISD)

		Elgin ISD – Action #1
	Proposed Action:	Implement education and awareness program utilizing classrooms, social media, bulletins, flyers, etc. to educate students, parents and area residents of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages.
	BACKGROUND INFORMATION	
	Site and Location:	District-wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Promote hazard awareness and protect citizens from potential injuries and damages.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Expansive Soils, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm, Earthquake, Hurricane/Tropical Storm, Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$5,000
Potential Funding Sources:	District Funds (staff time), State and Federal Grants
Lead Agency/Department Responsible:	CFO or Director of Maintenance
Implementation Schedule:	Within 12 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

		Elgin ISD – Action #2
	Proposed Action:	Upgrade ISD campuses to include drought mitigation measures such as grey water reuse systems, drought tolerant landscaping, installation of a sprinkler system with regular watering schedule and installation of French drains where high plasticity soils are indicated.
	BACKGROUND INFORMATION	
	Site and Location:	Elgin ISD campus facilities;
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Provide water for critical facilities during water outages and reduce water use.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Expansive Soils
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$100,000
Potential Funding Sources:	District Funds, State and Federal Grants
Lead Agency/Department Responsible:	CFO or Director of Maintenance
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:

		Elgin ISD – Action #3
	Proposed Action:	Provide natural gas-powered generators to all campuses in the event of a sustained power outage.
	BACKGROUND INFORMATION	
	Site and Location:	All school campuses (Booker T. Washington Elem.; Elgin Elementary; Neidig Elementary; Elgin Intermediate; Elgin Middle School; and Elgin High School).
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Continuity of services. Reduce cost to perishable food products estimated $15,000 per campus or $90,000 district-wide.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Earthquake, Extreme Heat, Hail, Hurricane/ Tropical Storm, Flood, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Energy (Power/Fuel), and Health/Medical
Effect on new/existing buildings:	Reduce risk to existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$75,000 per site ($450,000)
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	Elgin ISD – Maintenance and Operations
Implementation Schedule:	Within 1 year of plan adoption.
Incorporation into Existing Plans:	Emergency Operations Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Helps ensure critical facilities continue to provide services during a power outage caused by unforeseen events.

		Elgin ISD – Action #4
	Proposed Action:	Student-Staff weather safe room/auditorium: Provide storm-rated shelter for the Elgin High School campus to protect the health and safety of students, staff, and visitors.
	BACKGROUND INFORMATION	
	Site and Location:	Elgin High School
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk of injury and loss of life.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hurricane/Tropical Storm, Thunderstorm Wind, Tornado, Hail
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety and Security, Health/Medical
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$500,000
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	Elgin ISD – Maintenance and Operations
Implementation Schedule:	Within 2 year of plan adoption.
Incorporation into Existing Plans:	Emergency Operation Plan, Capital Improvement Plan

COMMENTS:
The Elgin ISD is planning on building a fine arts center as part of a bond program at the Elgin High School. A FEMA or related grant would be needed for the life-safety portions of the structure before construction begins and bids are awarded.

		Elgin ISD – Action #5
	Proposed Action:	Installation of uninterruptible power supplies on public address and radio repeater systems.
	BACKGROUND INFORMATION	
	Site and Location:	All school campuses (Booker T. Washington Elem.; Elgin Elementary; Neidig Elementary; Elgin Intermediate; Elgin Middle School; Elgin High School and district transportation bldg)
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Maintain communication during short-term power outages. Promote hazard awareness and protect public from potential injuries and damages.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project, Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Earthquake, Extreme Heat, Hail, Hurricane/ Tropical Storm, Flood, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Communication
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,600 per site. $11,200 total for district.
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	Elgin ISD – Technology
Implementation Schedule:	Within 1 year of plan adoption.
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
Public address system incorporates emergency alerts for campuses. This is used in conjunction with the two-way radios during emergencies.
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Promotes public safety.

		Elgin ISD – Action #6
	Proposed Action:	Construct fencing around campuses for security.
	BACKGROUND INFORMATION	
	Site and Location:	All school campuses (Booker T. Washington Elem.; Elgin Elementary; Neidig Elementary; Elgin Intermediate; Elgin Middle School; and Elgin High School).
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Prevent unauthorized person from entering onto district property.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Preparedness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Preparedness
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Upgrades of existing and new buildings
Priority (High, Moderate, Low):	High
Estimated Cost:	$160,000 per site ($960,000)
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	Elgin ISD – Maintenance and Operations
Implementation Schedule:	Within 1 year of plan adoption.
Incorporation into Existing Plans:	N/A

COMMENTS:
Fencing is needed due to large housing developments around district properties.

		Elgin ISD – Action #7
	Proposed Action:	Installation of IP Security Cameras throughout the district.
	BACKGROUND INFORMATION	
	Site and Location:	All school campuses (Booker T. Washington Elem.; Elgin Elementary; Neidig Elementary; Elgin Intermediate; Elgin Middle School; Elgin High School, Transportation, and Administrative Bldgs).
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Prevention/deterrence of crime and school violence. Access and monitor exterior and interior of district buildings. Discourages vandalism and trespassing.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Preparedness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Preparedness
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$150,000 district-wide
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	Elgin ISD – Technology
Implementation Schedule:	Within 1 year of plan adoption.
Incorporation into Existing Plans:	N/A

COMMENTS:

MCDADE INDEPENDENT SCHOOL DISTRICT (ISD)

		McDade ISD – Action #1
	Proposed Action:	Implement education and awareness program utilizing classrooms, social media, bulletins, flyers, etc. to educate students, parents and area residents of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages.
	BACKGROUND INFORMATION	
	Site and Location:	District-wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Promote hazard awareness and protect citizens from potential injuries and damages.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Expansive Soils, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm, Earthquake, Hurricane/Tropical Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$5,000
Potential Funding Sources:	District Funds (staff time), State and Federal Grants
Lead Agency/Department Responsible:	CFO or Director of Maintenance
Implementation Schedule:	Within 12 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

		McDade ISD – Action #2
	Proposed Action:	Acquire and install generators with hard wired quick connections at all critical facilities.
	BACKGROUND INFORMATION	
	Site and Location:	District critical facilities
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Provide power for critical facilities during power outages and ensure continuity of critical services.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Extreme Heat, Hail, Lightning, Thunderstorm Wind, Flood, Tornado, Wildfire, Winter Storm, Earthquake, Hurricane/Tropical Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Energy (Power/Fuel)
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,000,000
Potential Funding Sources:	District Funds, State and Federal Grants
Lead Agency/Department Responsible:	CFO or Director of Maintenance
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Helps ensure critical facilities continue to provide services during a power outage caused by unforeseen events.

		McDade ISD – Action #3
	Proposed Action:	Upgrade ISD campuses to include drought mitigation measures such as grey water reuse systems, drought tolerant landscaping, installation of a sprinkler system with regular watering schedule and installation of French drains where high plasticity soils are indicated.
	BACKGROUND INFORMATION	
	Site and Location:	McDade ISD campus facilities
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Provide water for critical facilities during water outages and reduce water use.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Expansive Soils
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$100,000
Potential Funding Sources:	District Funds, State and Federal Grants
Lead Agency/Department Responsible:	CFO or Director of Maintenance
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:

SMITHVILLE INDEPENDENT SCHOOL DISTRICT (ISD)

		Smithville ISD – Action #1
	Proposed Action:	Implement education and awareness program utilizing classrooms, social media, bulletins, flyers, etc. to educate students, parents and area residents of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages.
	BACKGROUND INFORMATION	
	Site and Location:	District-wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Promote hazard awareness and protect citizens from potential injuries and damages.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Expansive Soils, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm, Earthquake, Hurricane/Tropical Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$5,000
Potential Funding Sources:	District Funds (staff time), State and Federal Grants
Lead Agency/Department Responsible:	CFO or Director of Maintenance
Implementation Schedule:	Within 12 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

		Smithville ISD – Action #2
	Proposed Action:	Acquire and install generators with hard wired quick connections at all critical facilities.
	BACKGROUND INFORMATION	
	Site and Location:	District critical facilities
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Provide power for critical facilities during power outages and ensure continuity of critical services.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Extreme Heat, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm, Earthquake, Hurricane/Tropical Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Energy (Power/Fuel), and Health/Medical
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,000,000
Potential Funding Sources:	District Funds, State and Federal Grants
Lead Agency/Department Responsible:	CFO or Director of Maintenance
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

		Smithville ISD – Action #3
	Proposed Action:	Upgrade ISD campuses to include drought mitigation measures such as grey water reuse systems, drought tolerant landscaping, installation of a sprinkler system with regular watering schedule and installation of French drains where high plasticity soils are indicated.
	BACKGROUND INFORMATION	
	Site and Location:	Smithville ISD campus facilities
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Provide water for critical facilities during water outages and reduce water use.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Expansive Soils
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$100,000
Potential Funding Sources:	District Funds, State and Federal Grants
Lead Agency/Department Responsible:	CFO or Director of Maintenance
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:

		Smithville ISD– Action #4
	Proposed Action:	Acquire and distribute NOAA weather radios to all campus locations and administrative office locations.
	BACKGROUND INFORMATION	
	Site and Location:	Smithville ISD campuses and administrative building.
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Promote hazard awareness and protect citizens from potential injuries and damages
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Education and Awareness, Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Earthquake, Expansive Soils, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Communication
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$30 per radio = $300 total v loss of life if unprepared for weather related hazard
Potential Funding Sources:	Local Funds
Lead Agency/Department Responsible:	Smithville ISD
Implementation Schedule:	Within 1 year of plan adoption
Incorporation into Existing Plans:	Emergency Communications Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Promote public safety.

		Smithville ISD– Action #5
	Proposed Action:	Digitize all district records.
	BACKGROUND INFORMATION	
	Site and Location:	Smithville ISD campuses and administrative building.
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Records can be accessed and/or recovered easily.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Earthquake, Expansive Soils, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Communication
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	Minimal
Potential Funding Sources:	Local Funds
Lead Agency/Department Responsible:	Smithville ISD
Implementation Schedule:	Within 1 year of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Ensure appropriate record keeping for hazard events.

		Smithville ISD– Action #6
	Proposed Action:	Implement emergency alert system for Smithville ISD staff, students and parents.
	BACKGROUND INFORMATION	
	Site and Location:	Smithville ISD campuses and administrative building.
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk of injury and loss but having the ability to quickly notify community members of hazardous situations.
	Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Earthquake, Expansive Soils, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Communication/Health/Security
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$5000/year
Potential Funding Sources:	Local Funds
Lead Agency/Department Responsible:	Smithville ISD
Implementation Schedule:	Within 1 year of plan adoption
Incorporation into Existing Plans:	Emergency Communications Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Promote public safety.

	Smithville ISD– Action #7
Proposed Action:	Implement emergency operations plan for all Smithville ISD campuses and the administrative building.
BACKGROUND INFORMATION	
Site and Location:	Smithville ISD campuses and administrative building.
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Ability to respond to hazardous situations in a planned and controlled manner.
Type of Action (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness):	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Earthquake, Expansive Soils, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Communication/Health/Security/Safety
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	Minimal
Potential Funding Sources:	Local Funds
Lead Agency/Department Responsible:	Smithville ISD
Implementation Schedule:	Within 1 year of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Promote public safety and appropriate response to hazard events.

BASTROP COUNTY MUD #1

	Bastrop County MUD #1– Action #1
Proposed Action:	Add back-up generator at water plant including hardwired quick connect.
BACKGROUND INFORMATION	
Site and Location:	Water Plant on Colovista Drive near River Forest
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Provide power for critical infrastructure during power outages and ensure continuity of critical services.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Earthquake, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety and Security, Energy (Power/Fuel)
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$10,000
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	MUD #1
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Enables safe and fast connection to electrical system.

	Bastrop County MUD #1– Action #2
Proposed Action:	An education/awareness program, in addition to our emergency notification system, for all natural hazards including but not limited to: insulating pipes, drip instructions during winter weather, water conservation, evacuation routes & procedures during wildfire & flooding events, etc.
BACKGROUND INFORMATION	
Site and Location:	District-wide
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Promote hazard awareness and protect citizens from potential injuries and damages.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Earthquake, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Communication
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$5,000
Potential Funding Sources:	Local Funds (staff time), State and Federal Grants
Lead Agency/Department Responsible:	MUD #1
Implementation Schedule:	Within 24 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

		Bastrop County MUD #1– Action #3
	Proposed Action:	Digitize all District records.
	BACKGROUND INFORMATION	
	Site and Location:	District-wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Records can be accessed and/or recovered easily.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Earthquake, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$5,000
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	MUD #1
Implementation Schedule:	Within 12 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Ensure appropriate record keeping of hazard events.

	Bastrop County MUD #1– Action #4
Proposed Action:	Acquire and install generators with hard wired quick connections at all critical facilities.
BACKGROUND INFORMATION	
Site and Location:	District-wide critical facilities
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Provide power for critical infrastructure during power outages and ensure continuity of critical services.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Earthquake, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,000,000
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	MUD #1
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Helps ensure critical facilities continue to provide services during a power outage caused by unforeseen events.

	Bastrop County MUD #1– Action #5
Proposed Action:	Harden critical facilities to hazard-resistant levels.
BACKGROUND INFORMATION	
Site and Location:	District-wide critical facilities
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce damages at critical facilities; Ensure continuity of critical services during and after event; Reduce risk of injury to emergency and critical personnel.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Earthquake, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm, Expansive Soils*
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,000,000
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	MUD #1
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
*All of our water distribution pipelines and sewerage are critical facilities. Part of the hardening and/or meeting state specs will protect all pipelines from rupturing due to expansive soils.
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

	Bastrop County MUD #1– Action #6
Proposed Action:	Supervisory Control and Data Acquisition System (SCADA)-Wireless Monitoring, Alarm & Controls
BACKGROUND INFORMATION	
Site and Location:	Water Treatment Plant, Sewer Treatment Plant, Future Water Treatment Plant under Item 13 and AWR Offices in Austin
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to property damages.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Earthquake, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structure and infrastructure
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000 +
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	MUD #1 and Bastrop County
Implementation Schedule:	Within 24-36 months of plan adoption
Incorporation into Existing Plans:	Captial Improvement Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

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		Bastrop County MUD #1– Action #7
	Proposed Action:	Bring all utility infrastructure up to state specifications.
	BACKGROUND INFORMATION	
	Site and Location:	District-wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to property damages.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Earthquake, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm, Expansive Soils
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to existing structures and infrastructure
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$1,000,000
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	MUD #1 and Bastrop County
Implementation Schedule:	Within 24-36 months of plan adoption
Incorporation into Existing Plans:	Capital Improvement Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

	Bastrop County MUD #1– Action #8
Proposed Action:	Repurpose treated sewage effluent for preservation and conservation of green space areas.
BACKGROUND INFORMATION	
Site and Location:	District-wide
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to property damages.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000 +
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	MUD #1 and Bastrop County
Implementation Schedule:	Within 24-36 months of plan adoption
Incorporation into Existing Plans:	Capital Improvement Plan

COMMENTS:

		Bastrop County MUD #1– Action #9
	Proposed Action:	Repair road to STP/Bring up to County Standards.
	BACKGROUND INFORMATION	
	Site and Location:	Colovista Ranch Road
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to property damages. Reduce risk of injury and loss of life.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure, Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Earthquake, Extreme Heat, Flood, Hail, Hurricane/Tropical Storm, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to existing infrastructure
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$100,000 +
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	MUD #1 and Bastrop County
Implementation Schedule:	Within 24-36 months of plan adoption
Incorporation into Existing Plans:	Capital Improvement Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

	Bastrop County MUD #1– Action #10
Proposed Action:	Add fire hydrants to meet state standards.
BACKGROUND INFORMATION	
Site and Location:	District-wide
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to property damages.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structures and infrastructures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000 +
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	MUD #1 and Bastrop County
Implementation Schedule:	Within 24-36 months of plan adoption
Incorporation into Existing Plans:	Capital Improvement Plan

COMMENTS:

		Bastrop County MUD #1– Action #11
	Proposed Action:	Develop models to define our water and wastewater systems.
	BACKGROUND INFORMATION	
	Site and Location:	District-wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to property damages. Reduce loss of life.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations (Other)

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Wildfire
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$10,000
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	MUD #1
Implementation Schedule:	Within 24-36 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:

		Bastrop County MUD #1– Action #12
	Proposed Action:	Evaluate the water infrastructure for the ability to provide fire protection.
	BACKGROUND INFORMATION	
	Site and Location:	District-wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to property damages. Reduce loss of life.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$10,000
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	MUD #1 and Bastrop County
Implementation Schedule:	Within 24-36 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:

		Bastrop County MUD #1– Action #13
	Proposed Action:	Increase 4" Water Lines to 6" Water Lines in 3 areas for Fire Protection.
	BACKGROUND INFORMATION	
	Site and Location:	District-wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to property damages. Reduce loss of life.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structures and infrastructures
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,000,000 +
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	MUD #1 and Bastrop County
Implementation Schedule:	Within 36-48 months of plan adoption
Incorporation into Existing Plans:	Capital Improvement Plan

COMMENTS:

	Bastrop County MUD #1– Action #14
Proposed Action:	New Well and Water Plant to provide "less pressurized" water service to the Lower Section and also provide more water volume for Fire Protection.
BACKGROUND INFORMATION	
Site and Location:	Mountain Laurel/Pro Shop/Maintenance Barn Area
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk of property damage and loss of life.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$500,000+
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	MUD #1 and Bastrop County
Implementation Schedule:	Within 24-36 months of plan adoption
Incorporation into Existing Plans:	Capital Improvement Plan

COMMENTS:

		Bastrop County MUD #1– Action #15
	Proposed Action:	Relocate water and wastewater line along path parallel to River out of the floodplain/high hazard area.
	BACKGROUND INFORMATION	
	Site and Location:	Colovista Parkway and Riverwalk down to Bobolink.
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to property damages. Reduce loss of life.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,000,000+
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	MUD #1 and Bastrop County
Implementation Schedule:	Within 36-48 months of plan adoption
Incorporation into Existing Plans:	Capital Improvement Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

	Bastrop County MUD #1– Action #16
Proposed Action:	Repair eroded area adjacent to the road to the Sewer Treatment Plant.
BACKGROUND INFORMATION	
Site and Location:	Colovista Ranch Road
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to property damages. Reduce risk of injury and loss life.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project (Response/Recovery)

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm Wind, Hurricane/Tropical Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to existing structure and infrastructure.
Priority (High, Moderate, Low):	High
Estimated Cost:	$250,000+
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	MUD #1 and Bastrop County
Implementation Schedule:	Within 36-48 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
FEMA issue.
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

		Bastrop County MUD #1– Action #17
	Proposed Action:	Implement development & drainage regulations for future development and construction projects. Restrict development in high-risk areas. Update development codes for higher level of ingress & egress.
	BACKGROUND INFORMATION	
	Site and Location:	District-wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to property damages. Reduce loss of life. Improve stormwater drainage capacity
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane/Tropical Storm, Wildfire
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$50,000
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	MUD #1 and Bastrop County
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Recue risk of flooding, protect properties, and increase public safety.

		Bastrop County MUD #1– Action #18
	Proposed Action:	Comprehensive Drainage Study for entire service area.
	BACKGROUND INFORMATION	
	Site and Location:	District-wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to property damages. Reduce loss of life. Improve stormwater drainage capacity.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,000,000+
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	MUD #1 and Bastrop County
Implementation Schedule:	Within 36-48 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Recue risk of flooding, protect properties, and increase public safety.

	Bastrop County MUD #1– Action #19
Proposed Action:	Plant vegetation along drainage channels in order to retard erosion and prevent development adjacent to floodplain areas.
BACKGROUND INFORMATION	
Site and Location:	District-wide
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to property damages. Reduce loss of life.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations, Natural System Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to existing and new structures and infrastructure
Priority (High, Moderate, Low):	High
Estimated Cost:	$10,000
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	MUD #1 and Bastrop County
Implementation Schedule:	Within 36-48 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Recue risk of flooding, protect properties, and increase public safety.

	Bastrop County MUD #1– Action #20
Proposed Action:	Upgrade poor-performing and undersized stormwater system components.
BACKGROUND INFORMATION	
Site and Location:	District-wide
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to property damages. Reduce loss of life. Improve stormwater drainage capacity.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to existing and new structures and infrastructure
Priority (High, Moderate, Low):	High
Estimated Cost:	$3,000,000+
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	MUD #1 and Bastrop County
Implementation Schedule:	Within 24 months of plan adoption
Incorporation into Existing Plans:	Capital Improvement Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

	Bastrop County MUD #1– Action #21
Proposed Action:	Install electronic water meters to all customers.
BACKGROUND INFORMATION	
Site and Location:	District-wide
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to property damages. Reduce loss of life.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations (Other)

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structures and infrastructures
Priority (High, Moderate, Low):	High
Estimated Cost:	$2,500 per meter
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	MUD #1 and Bastrop County
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	Capital Improvement Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

	Bastrop County MUD #1– Action #22
Proposed Action:	Raise electrical components of sewage lift stations above the BFE.
BACKGROUND INFORMATION	
Site and Location:	District-wide
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk of flood water contamination; Reduce risk of surface water infiltration and sewage backup; Ensure continuity of critical services.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structures and infrastructures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$250,000
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	MUD #1 and Bastrop County
Implementation Schedule:	Within 24 months of plan adoption
Incorporation into Existing Plans:	Capital Improvements Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

	Bastrop County MUD #1– Action #23
Proposed Action:	Bury existing utility lines.
BACKGROUND INFORMATION	
Site and Location:	District-wide
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce damages to infrastructures; Ensure continuity of critical services during and after event. Reduce damages associated with power outages; Reduce risk of injuries or fatalities to vulnerable populations.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm Wind, Tornado, Hurricane/Tropical Storm, Flood, Hail, Lightning, Winter Storm, Wildfire
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Energy (Power/Fuel)
Effect on new/existing buildings:	Reduce risk to new and existing structures and infrastructures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$10,000,000
Potential Funding Sources:	Local Funds (staff time)
Lead Agency/Department Responsible:	MUD #1 and Bastrop County
Implementation Schedule:	Within 24-36 months of plan adoption
Incorporation into Existing Plans:	Capital Improvement Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

SECTION 24: MITIGATION ACTIONS

SECTION 24: MITIGATION ACTIONS

	Bastrop County MUD #1– Action #24
Proposed Action:	Flood proof Sewer Treatment System Components in flood hazard/low lying areas.
BACKGROUND INFORMATION	
Site and Location:	District-wide
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk of flood water contamination; Reduce risk to surface water infiltration and sewage backup; Ensure continuity of critical services.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structures and infrastructures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$250,000
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	MUD #1 and Bastrop County
Implementation Schedule:	Within 24 months of plan adoption
Incorporation into Existing Plans:	Capital Improvements Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

	Bastrop County MUD #1– Action #25
Proposed Action:	Install a network of dry hydrants in ponds, water hazards, creeks, etc. to increase water supply for fire protection
BACKGROUND INFORMATION	
Site and Location:	District-wide
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk of property damages, injury and loss of life.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$750 per hydrant
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	MUD #1 and Bastrop County
Implementation Schedule:	Within 36 months of plan adoption
Incorporation into Existing Plans:	Capital Improvement Plan

COMMENTS:

	Bastrop County MUD #1– Action #26
Proposed Action:	Adopt and maintain a routine valve & fire hydrant maintenance program.
BACKGROUND INFORMATION	
Site and Location:	District-wide
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Ensure continuity of critical services.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structures and infrastructures
Priority (High, Moderate, Low):	High
Estimated Cost:	$5,000
Potential Funding Sources:	Local Funds (staff time)
Lead Agency/Department Responsible:	MUD #1 and Bastrop County
Implementation Schedule:	Within 12 months of plan adoption
Incorporation into Existing Plans:	Continuity of Operations Plan

COMMENTS:

		Bastrop County MUD #1– Action #27
	Proposed Action:	Review and update as necessary water and wastewater pipe separation.
	BACKGROUND INFORMATION	
	Site and Location:	District-wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk of flood water contamination; Reduce risk to surface water infiltration and sewage backup; Ensure continuity of critical services.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Local Plans and Regulations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Infectious Disease (Health & Sanitation)
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Health/Medical, Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structures and infrastructures
Priority (High, Moderate, Low):	High
Estimated Cost:	$10,000
Potential Funding Sources:	Local Funds (staff time)
Lead Agency/Department Responsible:	MUD #1 and Bastrop County
Implementation Schedule:	Within 12 months of plan adoption
Incorporation into Existing Plans:	Continuity of Operations Plan

COMMENTS:

		Bastrop County MUD #1– Action #28
	Proposed Action:	Add sewer clean out, main line valves, water valves and flush valves as needed.
	BACKGROUND INFORMATION	
	Site and Location:	District-wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk of flood water contamination; Reduce risk to surface water infiltration and sewage backup; Ensure continuity of critical services.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Infectious Disease (Health & Sanitation)
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Health/Medical, Safety/Security
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$2,500 per site
Potential Funding Sources:	Local, State, and Federal funds
Lead Agency/Department Responsible:	MUD #1 and Bastrop County
Implementation Schedule:	Within 24 months of plan adoption
Incorporation into Existing Plans:	Continuity of Operations Plan

COMMENTS:

		Bastrop County MUD #1– Action #29
	Proposed Action:	Additional security measures at the Sewer Treatment Plant, including new fencing.
	BACKGROUND INFORMATION	
	Site and Location:	Sewer Treatment Plant-Colovista Ranch Road
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to property damages, injury and loss of life.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Material
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to existing structure
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$5,000
Potential Funding Sources:	Local, State and Federal funds
Lead Agency/Department Responsible:	MUD #1 and Bastrop County
Implementation Schedule:	Within 24 months of plan adoption
Incorporation into Existing Plans:	Continuity of Operations Plan

COMMENTS:

BASTROP COUNTY WCID #2

	Bastrop County WCID #2 – Action # 1
Proposed Action:	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages within the district.
BACKGROUND INFORMATION	
Site and Location:	District wide
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Promote hazard awareness and protect citizens from potential injuries and damages.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Expansive Soils, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm, Hurricane/Tropical Storm, Earthquake
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Communication
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$5,000
Potential Funding Sources:	District Funds (staff time), State and Federal Grants
Lead Agency/Department Responsible:	District Coordinator
Implementation Schedule:	Within 12 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

		Bastrop County WCID #2 – Action # 2
	Proposed Action:	Acquire and install generators with hard wired quick connections at all WCID #2 critical facilities.
	BACKGROUND INFORMATION	
	Site and Location:	WCID #2 critical facilities
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Provide power for critical facilities during power outages and ensure continuity of critical services.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Extreme Heat, Flood, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm, Earthquake, Hurricane/Tropical Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Power/Fuel
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$250,000
Potential Funding Sources:	District Funds, State and Federal Grants
Lead Agency/Department Responsible:	District Coordinator
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Helps ensure critical facilities continue to provide services during a power outage caused by unforeseen events.

	Bastrop County WCID #2 – Action # 3
Proposed Action:	Upgrade maintenance facilities to include drought mitigation measures and expansive soils protection such as greywater reuse systems, drought tolerant landscaping, installation of a sprinkler system with regular watering schedule and installation of French drains where high plasticity soils are indicated.
BACKGROUND INFORMATION	
Site and Location:	Maintenance facilities/offices
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Provide water for critical facilities during water outages and reduce water use.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Expansive Soils
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$100,000
Potential Funding Sources:	District Funds, State and Federal Grants
Lead Agency/Department Responsible:	District Coordinator
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:

	Bastrop County WCID #2– Action #4
Proposed Action:	Obtain certification in the Nation Weather Service StormReady Program.
BACKGROUND INFORMATION	
Site and Location:	District-wide
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk to citizens by educating the public on how to prepare for hazards and disasters.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm Wind, Winter Storm, Tornado, Hail. Hurricane/Tropical Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Communication
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$10,000
Potential Funding Sources:	Local Funds (staff time), State and Federal Grants
Lead Agency/Department Responsible:	WCID #2
Implementation Schedule:	Within 24 months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Ensures public safety.

		Bastrop County WCID #2– Action #5
	Proposed Action:	Acquire, reuse, and preserve open spaces adjacent to floodplain areas and dams.
	BACKGROUND INFORMATION	
	Site and Location:	District-wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk of property damage, injury and loss of life.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Natural Systems Protection

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm Wind, Wildfire, Winter Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety and Security
Effect on new/existing buildings:	Reduce risk to new and existing structure and infrastructure
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,000,000+
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	WCID #2 and Bastrop County
Implementation Schedule:	Within 24 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Allocates areas for flood mitigation and increases public safety.

	Bastrop County WCID #2– Action #6
Proposed Action:	Install a network of dry hydrants in stock ponds, creeks, and small lakes to increase the supply of water for fire protection.
BACKGROUND INFORMATION	
Site and Location:	District-wide
Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk of property damage, injury and loss of life.
Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Natural Systems Protection, Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Wildfire
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security
Effect on new/existing buildings:	Reduce risk to new and existing structures and infrastructures
Priority (High, Moderate, Low):	High
Estimated Cost:	$750 per hydrant
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	WCID #2 and Bastrop County
Implementation Schedule:	Within 12-36 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:

		Bastrop County WCID #2– Action #7
	Proposed Action:	Install fire danger rating/burn ban signs.
	BACKGROUND INFORMATION	
	Site and Location:	District-wide
	Risk Reduction Benefit (Current Cost/Losses Avoided)**:**	Reduce risk of property damage, injury and loss of life.
	Type of Action: (Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Communication, Safety/Security
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$5,000
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	WCID #2
Implementation Schedule:	Within 12 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:

BASTROP COUNTY WCID #3

	Bastrop County WCID #3 – Action # 1
Proposed Action:	Implement education and awareness program utilizing district meetings, social media, bulletins, flyers, etc. to educate residents and area residents of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages within the district.
BACKGROUND INFORMATION	
Site and Location:	District service area
Risk Reduction Benefit: *(Current Cost/Losses Avoided)*	Promote hazard awareness and protect citizens from potential injuries and damages.
Type of Action: *(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)*	Education and Awareness

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Expansive Soils, Hail, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm, Flood, Hurricane/Tropical Storm, Earthquake
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Communication
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$5,000
Potential Funding Sources:	Local Funds (staff time), State and Federal Grants
Lead Agency/Department Responsible:	District Board Members/Coordinator
Implementation Schedule:	Within 12 months of plan adoption
Incorporation into Existing Plans:	N/A

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Protects infrastructure, reduces cost of reparation and prevents injury to residents.

		Bastrop County WCID #3 – Action # 2
	Proposed Action:	Upgrade critical facilities within the district to include drought mitigation measures and expansive soils protection such as greywater reuse systems, drought tolerant landscaping, installation of a sprinkler system with regular watering schedule and installation of French drains where high plasticity soils are indicated.
	BACKGROUND INFORMATION	
	Site and Location:	Critical facilities within the WCID #3
	Risk Reduction Benefit: *(Current Cost/Losses Avoided)*	Reduce damages and water usage at critical facilities
	Type of Action: *(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)*	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Expansive Soils
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Safety/Security, Communication
Effect on New/Existing Buildings:	Reduce risk to new and existing structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$100,000
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	District Board Members/Coordinator
Implementation Schedule:	Within 24 months of plan adoption
Incorporation into Existing Plans:	Capital Improvement Plan

COMMENTS:

		Bastrop County WCID #3 – Action # 3
	Proposed Action:	Acquire and install generators with hard wired quick connections at critical facilities within the district.
	BACKGROUND INFORMATION	
	Site and Location:	Critical facilities within the WCID #3
	Risk Reduction Benefit: *(Current Cost/Losses Avoided)*	Provide power for critical facilities during power outages and ensure continuity of critical services.
	Type of Action: *(Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection, or Education and Awareness)*	Structure and Infrastructure Project

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Extreme Heat, Hail, Lightning, Thunderstorm Wind, Tornado, Flood, Wildfire, Winter Storm, Earthquake, Hurricane/Tropical Storm
Community Lifeline (Safety/Security, Health/Medical, Energy (Power/Fuel), Communication):	Power/Fuel
Effect on New/Existing Buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,000,000
Potential Funding Sources:	Local Funds, State and Federal Grants
Lead Agency/Department Responsible:	District Board Members/Coordinator
Implementation Schedule:	Within 12-24 months of plan adoption
Incorporation into Existing Plans:	Emergency Management Plan

COMMENTS:
CRS REQUIREMENT & WHY MITIGATION ACTION IS APPROPRIATE:
Helps ensure critical facilities continue to provide services during a power outage caused by unforeseen events.

SECTION 25: PLAN MAINTENANCE

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PLAN MAINTENANCE PROCEDURES

The following is an explanation of how the participating jurisdictions within Bastrop County, and the general public will be involved in implementing, evaluating, and enhancing the Plan over time. When the plan is discussed in all maintenance procedures it includes mitigation actions and hazard assessments. The sustained hazard mitigation planning process consists of four main parts:

- Incorporation
- Monitoring and Evaluation
- Updating
- Continued Public Involvement

INCORPORATION

Participating jurisdictions within Bastrop County will be responsible for further development and implementation of mitigation actions. Each action has been assigned to a specific department within the participating jurisdictions. The following describes the process by which participating jurisdictions will incorporate elements of the mitigation plan into other planning mechanisms.

PROCESS OF INCORPORATION

Once the Plan Update is adopted, participating jurisdictions within Bastrop County will implement actions based on priority and the availability of funding. The Planning Area currently implements policies and programs to reduce loss to life and property from hazards. The mitigation actions developed for this Plan Update enhance this ongoing effort and will be implemented through other program mechanisms where possible.

The potential funding sources listed for each identified action may be used when the jurisdiction seeks funds to implement actions. An implementation time period or a specific implementation date has been assigned to each action as an incentive for completing each task and gauging whether actions are implemented in a timely manner.

SECTION 25: PLAN MAINTENANCE

Participating jurisdictions within Bastrop County will integrate implementation of their mitigation actions with other plans and policies such as construction standards and emergency management plans, and ensure that these actions, or proposed projects, are reflected in other planning efforts. Coordinating and integrating components of other plans and policies into goals and objectives of the Plan Update will further maximize funding and provide possible cost-sharing of key projects, thereby reducing loss of lives and property and mitigating hazards affecting the area.

Upon formal adoption of the Plan Update, planning team members from each participating jurisdiction will work to integrate the hazard mitigation strategies into other plans and codes as they are developed. Participating team members will conduct periodic reviews of plans and policies, once per year at a minimum, and analyze the need for revisions in light of the approved Plan. The planning team will review all comprehensive land use plans, capital improvement plans, annual budget reviews, emergency operations or management plans, and transportation plans (applicable jurisdictions only) to guide and control development. Participating jurisdictions will ensure that capital improvement planning in the future will also contribute to the goals of this hazard mitigation Plan Update to reduce the long-term risk to life and property from all hazards. Within one year of formal adoption of the hazard mitigation Plan Update, existing planning mechanisms will be reviewed by each jurisdiction.

Bastrop County is committed to supporting the participating jurisdictions as they implement their mitigation actions. Planning team members will review and revise, as necessary, the long-range goals and objectives in strategic plan and budgets to ensure that they are consistent with this mitigation action plan. Additionally, the Planning Area will work to advance the goals of this hazard mitigation plan through its routine, ongoing, long-range planning, budgeting, and work processes.

Table 25-1 identifies types of planning mechanisms and examples of methods for incorporating the Plan Update into other planning efforts. The team members, listed in Table 25-2 below, will be responsible for the review of these planning mechanisms and their incorporation of the plan, with the exception of the Floodplain Management Plans; the jurisdictions who have a Floodplain Administrator on staff will be responsible for incorporating the plan when floodplain management plans are updated or new plans are developed.

Table 25-1. Methods of Incorporation of the Plan

PLANNING MECHANISM	DEPARTMENT / TITLE RESPONSIBLE	INCORPORATION OF PLAN
Annual Budget Review	Bastrop County: EMC City of Bastrop: EMC City of Elgin: Interim Police Chief City of Smithville: EMC Bastrop ISD: Director of Safety & Security Elgin ISD: Director of Safety & Security McDade ISD: Interim Superintendent Smithville ISD: State & Federal Programs Director MUD #1: Former President	Various departments and key personnel that participated in the planning process for participating jurisdictions within Bastrop County will review the Plan and mitigation actions therein when conducting their annual budget review. Allowances will be made in accordance with grant applications sought, and mitigation actions that will be undertaken, according to the implementation schedule of the specific action.

PLANNING MECHANISM	DEPARTMENT / TITLE RESPONSIBLE	INCORPORATION OF PLAN
	WCID #2: General Manager WCID #3: PIO	
Capital Improvement Plans	Bastrop County: EMC City of Bastrop: EMC City of Elgin: Interim Police Chief City of Smithville: EMC Bastrop ISD: Director of Safety & Security Elgin ISD: Director of Safety & Security McDade ISD: Interim Superintendent MUD #1: Former President WCID #2: General Manager WCID #3: PIO	Participating jurisdictions within Bastrop County have a Capital Improvement Plan (CIP) in place. Prior to any revisions to the CIP, County, City, ISD and Special District departments will review the risk assessment and mitigation strategy sections of the HMAP, as limiting public spending in hazardous zones is one of the most effective long-term mitigation actions available to local governments.
Comprehensive Plans	City of Bastrop: EMC City of Smithville: EMC Bastrop ISD: Director of Safety & Security McDade ISD: Interim Superintendent	Several participating jurisdictions within Bastrop County have Long-term Comprehensive Development Plans in place. Since comprehensive plans involve developing a unified vision for a community, the mitigation vision and goals of the Plan will be reviewed in the development or revision of a Comprehensive Plan.
Floodplain Management Plans	Bastrop County: Floodplain Administrator City of Bastrop: Floodplain Administrator City of Elgin: Floodplain Administrator City of Smithville: Floodplain Administrator	Floodplain management plans include preventative and corrective actions to address the flood hazard. Therefore, the actions for flooding and information found in Section 5 of this Plan Update discussing the people and property at risk to flood will be reviewed and revised when participating jurisdictions within Bastrop County update their management plans or develops new plans.
Grant Applications	Bastrop County: EMC City of Bastrop: EMC City of Elgin: Interim Police Chief City of Smithville: EMC Bastrop ISD: Director of Safety & Security Elgin ISD: Director of Safety & Security	The Plan will be evaluated by participating jurisdictions within Bastrop County when grant funding is sought for mitigation projects. If a project is not in the Plan Update, a Plan Revision may be necessary to include the action in the Plan.

PLANNING MECHANISM	DEPARTMENT / TITLE RESPONSIBLE	INCORPORATION OF PLAN
	McDade ISD: Interim Superintendent Smithville ISD: State & Federal Programs Director MUD #1: Former President WCID #2: General Manager WCID #3: PIO	
Regulatory Plans	Bastrop County: EMC City of Bastrop: EMC City of Elgin: Interim Police Chief City of Smithville: EMC Bastrop ISD: Director of Safety & Security Elgin ISD: Director of Safety & Security McDade ISD: Interim Superintendent Smithville ISD: State & Federal Programs Director MUD #1: Former President WCID #2: General Manager	Currently, participating jurisdictions within Bastrop County have regulatory plans in place, such as Emergency Management Plans, Continuity of Operations Plans, Land Use Plans, and Evacuation Plans. The Plan Update will be consulted when County, City, ISD and Special District departments review or revise their current regulatory planning mechanisms, or in the development of regulatory plans that are not currently in place.

MONITORING AND EVALUATION

Periodic revisions of the Plan are required to ensure that goals, objectives, and mitigation actions are kept current. When the plan is discussed in these sections it includes the risk assessment and mitigation actions as a part of the monitoring, evaluating, updating and review process. Revisions may be required to ensure the Plan is in compliance with federal and state statutes and regulations. This section outlines the procedures for completing Plan revisions, updates, and review. Table 25-2 indicates the department and title of the party responsible for Plan monitoring, evaluating, updating, and review of the Plan.

Table 25-2. Team Members Responsible for Plan Monitoring, Evaluating, Updating, and Review of the Plan

JURISDICTION	TITLE
Bastrop County	Emergency Management Coordinator
City of Bastrop	Emergency Management Coordinator
City of Elgin	Interim Police Chief
City of Smithville	Emergency Management Coordinator
Bastrop ISD	Director of Safety & Security

SECTION 25: PLAN MAINTENANCE

JURISDICTION	TITLE
Elgin ISD	Director of Safety & Security
McDade ISD	Interim Superintendent
Smithville ISD	State & Federal Programs Director
MUD #1	Former President, Board of Directors
WCID #2	General Manager
WCID #3	Public Information Officer

MONITORING

Designated Planning Team members are responsible for monitoring, evaluating, updating, and reviewing the Plan, as shown in Table 25-2. Individuals holding the title listed in Table 25-2 will be responsible for monitoring the Plan on an annual basis. Plan monitoring includes reviewing and incorporating into the Plan other existing planning mechanisms that relate or support goals and objectives of the Plan; monitoring the incorporation of the Plan into future updates of other existing planning mechanisms as appropriate; reviewing mitigation actions submitted and coordinating with various County, City , ISD, and special districts' departments to determine if mitigation actions need to be re-evaluated and updated; evaluating and updating the Plan as necessary; and monitoring plan maintenance to ensure that the process described is being followed, on an annual basis, throughout the planning process. The Planning Team will develop a brief report that identifies policies and actions in the plan that have been successfully implemented and any changes in the implementation process needed for continued success. A summary of meeting notes will report the particulars involved in developing an action into a project. In addition to the annual monitoring, the Plan will be similarly reviewed immediately after extreme weather events include but not limited to state and federally declared disasters.

EVALUATION

As part of the evaluation process, the Planning Team will assess changes in risk; determine whether the implementation of mitigation actions is on schedule; determine whether there are any implementation problems, such as technical, political, legal, or coordination issues; and identify changes in land development or programs that affect mitigation priorities for each respective department or organization.

The Planning Team will meet on an annual basis to evaluate the Plan and identify any needed changes and assess the effectiveness of the plan achieving its stated purpose and goals. The team will evaluate the number of mitigation actions implemented along with the loss-reduction associated with each action. Actions that have not been implemented will be evaluated to determine if any social, political, or financial barriers are impeding implementation and if any changes are necessary to improve the viability of an action. The team will evaluate changes in land development and/or programs that affect mitigation priorities in their respective jurisdictions. The annual evaluation process will help to determine if any changes are necessary. In addition, the Plan will be similarly evaluated immediately after extreme weather events including but not limited to state and federally declared disasters.

SECTION 25: PLAN MAINTENANCE

UPDATING

PLAN REVISIONS

At any time, minor technical changes may be made to update the Bastrop County Hazard Mitigation Action Plan Update 2022. Material changes to mitigation actions or major changes in the overall direction of the Plan or the policies contained within it, must be subject to formal adoption by the participating jurisdictions.

The participating jurisdictions within Bastrop County will review proposed revisions and vote to accept, reject, or amend the proposed change. Upon ratification, the Revision will be transmitted to TDEM.

In determining whether to recommend approval or denial of a Plan Revision request, participating jurisdictions will consider the following factors:

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

FIVE (5) YEAR REVIEW

The Plan will be thoroughly reviewed by the Planning Team at the end of three years from the approval date, to determine whether there have been significant changes in the planning area that necessitate changes in the types of mitigation actions proposed. Factors that may affect the content of the Plan include new development in identified hazard areas, increased exposure to hazards, disaster declarations, increase or decrease in capability to address hazards, and changes to federal or state legislation.

The Plan review process provides the participating jurisdictions within Bastrop County an opportunity to evaluate mitigation actions that have been successful, identify losses avoided due to the implementation of specific mitigation measures, and address mitigation actions that may not have been successfully implemented as assigned.

It is recommended that the full Executive and Advisory Planning Team (Section 2, Tables 2-1 and 2-2) meet to review the Plan at the end of three years because grant funds may be necessary for the development of a five-year update. Reviewing planning grant options in advance of the five-year Plan update deadline is recommended considering the timelines for grant and planning cycles can be in excess of a year.

Following the Plan review, any revisions deemed necessary will be summarized and implemented according to the reporting procedures and Plan Revision process outlined herein. Upon completion of the review, update, and revision process the revised Plan will be submitted to TDEM for final review and approval in coordination with FEMA.

CONTINUED PUBLIC INVOLVEMENT

Public input was an integral part of the preparation of this Plan and will continue to be essential for Plan updates. The Public will be directly involved in the annual evaluation, monitoring, reviews and cyclical updates. Changes or suggestions to improve or update the Plan will provide opportunities for additional public input.

SECTION 25: PLAN MAINTENANCE

The public can review the Plan on the participating jurisdictions' websites, where officials and the public are invited to provide ongoing feedback, via email.

The Planning Team may also designate voluntary citizens from the planning area or willing stakeholder members from the private sector businesses that were involved in the Plan's development to provide feedback on an annual basis. It is important that stakeholders and the immediate community maintain a vested interest in preserving the functionality of the planning area as it pertains to the overall goals of the mitigation plan. The Planning team is responsible for notifying stakeholders and community members on an annual basis and maintaining the Plan.

Media, including local newspaper and radio stations, will be used to notify the public of any maintenance or periodic review activities during the implementation, monitoring, and evaluation phases. Additionally, local news media will be contacted to cover information regarding Plan updates, status of grant applications, and project implementation. Local and social media outlets, such as Facebook and Twitter, will keep the public and stakeholders apprised of potential opportunities to fund and implement mitigation projects identified in the Plan.

APPENDIX A: PLANNING TEAM

Planning Team Members 1
Stakeholders 2

PLANNING TEAM MEMBERS

The Bastrop County Hazard Mitigation Action Plan 2022 was organized using a direct representative model. An Executive Planning Team from the participating jurisdictions, shown in Table A-1, was formed to coordinate planning efforts and request input and participation in the planning process. Table A-2 reflects the Advisory Planning Team, consisting of area organizations and departments that participated throughout the planning process. Table A-3 is comprised of stakeholders who were invited to provide Plan input. Public outreach efforts and meeting documentation is provided in Appendix E.

Table A-1. Executive Planning Team

ORGANIZATION / DEPARTMENT	TITLE
Bastrop County	Emergency Management Coordinator
Bastrop County	County Engineer
City of Bastrop	Emergency Management Coordinator
City of Elgin	Interim Police Chief
City of Smithville	City Manager
Bastrop ISD	Director of Safety and Security
Elgin ISD	Director of Safety and Security
McDade ISD	Interim Superintendent
Smithville ISD	State & Federal Programs Director
Bastrop County MUD #1	President, Board of Directors
Bastrop County WCID #2	General Manager
Bastrop County WCID #3	Public Information Officer

Table A-2. Advisory Planning Team

ORGANIZATION / DEPARTMENT	TITLE
Bastrop County	Assistant Emergency Management Coordinator
Bastrop County	Floodplain Administrator

APPENDIX A: PLANNING TEAM

ORGANIZATION / DEPARTMENT	TITLE
Bastrop County	Precinct 2 County Commissioner
Bastrop County	Precinct 3 County Commissioner
City of Bastrop	Director of Planning and Development
City of Bastrop	City Manager
City of Bastrop	Senior Planner and GIS Coordinator
City of Elgin	City Manager
City of Smithville	Emergency Management Coordinator
City of Smithville	Mayor
Bastrop ISD	Superintendent
Elgin ISD	Superintendent
McDade ISD	Administrative Assistant to Superintendent
McDade ISD	Director of Operations
Smithville ISD	Superintendent
Bastrop County MUD #1	Former President, Board of Directors
Bastrop County WCID #2	Board Member / Secretary

STAKEHOLDERS

The following groups listed in Table A-3 represent a list of organizations invited to stakeholder meetings, public meetings, and workshops throughout the planning process and include: non-profit organizations, private businesses, universities, and legislators. The public were also invited to participate via e-mail throughout the planning process. Many of the invited organizations and stakeholders participated and were integral to providing comments and data for the Plan. For a list of attendees at meetings, please see Appendix E[1].

Table A-3. Stakeholders

AGENCY	TITLE
Acadian Ambulance	Emergency Management Coordinator
Ascension Seton Bastrop / Smithville Hospital	Emergency Management Coordinator

[1] Information contained in Appendix E is exempt from public release under the Freedom of Information Act (FOIA).

APPENDIX A: PLANNING TEAM

AGENCY	TITLE
Ascension Seton Bastrop / Smithville Hospital	Safety Officer II
Aqua Water Corporation	General Manager
Austin American-Statesman	Reporter
Bastrop County ESD #1	Fire Chief
Bastrop County ESD #2	Fire Chief
Bastrop County Long Term Recovery Team	Executive Director
Bluebonnet Electric	Emergency Management Coordinator
Caldwell County	County Judge
Caldwell County	Emergency Management Coordinator
Capital Area Council of Governments	Regional Representative
CCS Global Tech	SVP
Environmental Protection Agency, Region 6	Regional Administrator
Fayette County	Emergency Management Coordinator
Fayette County	Floodplain Manager
Langford Community Management Services	HMAP Grant Administrator
Lee County	Code Enforcement Officer
Lee County	Emergency Management Coordinator
Lower Colorado River Authority (LCRA)	Emergency Management Coordinator
Railroad Commission of Texas, District #1 Field Office	Safety Coordinator
St. David's Bastrop Emergency Center	FSED Manager
Texas Commission on Environmental Quality (TCEQ), Region 11	Regional Director
Texas Commission on Environmental Quality (TCEQ), Region 11	ERC
Texas Department of Transportation	Area Engineer
Texas Department of Transportation	Area Engineer Assistant
Texas Division of Emergency Management (TDEM)	District 12 Regional Coordinator
Texas Forest Service	Regional Fire Coordinator

APPENDIX A: PLANNING TEAM

AGENCY	TITLE
Texas House District 14	Senator
Texas House District 17	Legislative Representative
Texas Parks and Wildlife	Park Superintendent
Texas Water Board	Outreach Specialist
Travis County	Director of Emergency Management
Williamson County	Emergency Management Coordinator
Williamson County	GIS Manager

APPENDIX B: PUBLIC SURVEY RESULTS

Overview 1
Public Survey Results 2

OVERVIEW

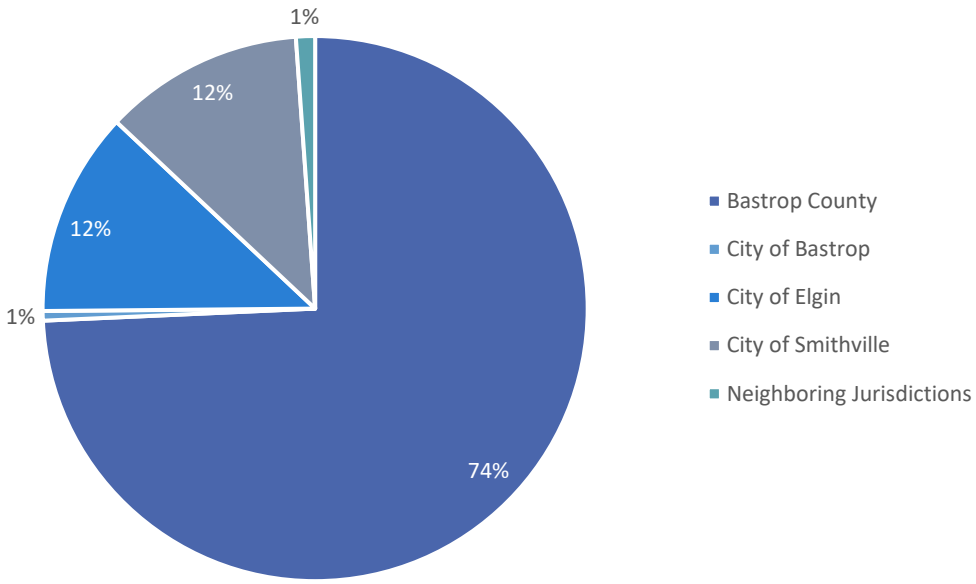
Bastrop County prepared a public survey that requested public opinion on a wide range of questions relating to natural hazards. The survey was made available via the County's websites, along with participating jurisdictions. This survey link was also distributed at public meetings and stakeholder events throughout the planning process.

A total of 354 surveys were collected, the results of which are analyzed in Appendix B. The purpose of the survey was twofold: 1) to solicit public input during the planning process, and 2) to help the jurisdictions identify any potential actions or problem areas.

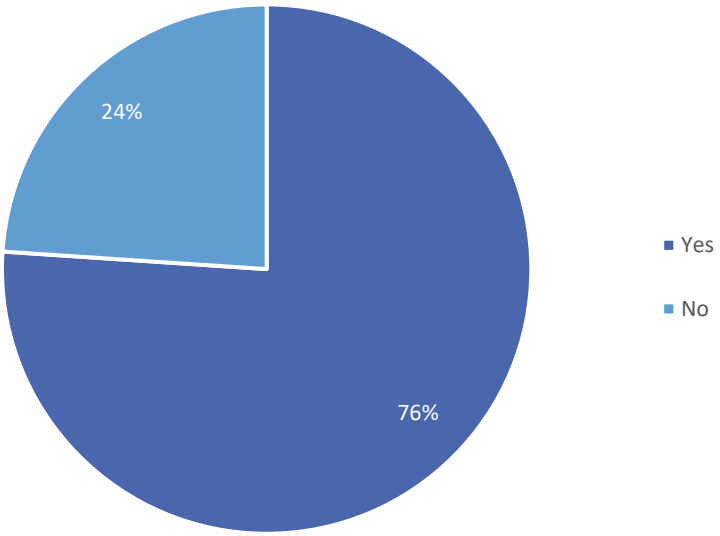
The following survey results depict the percentage of responses for each answer. Similar responses have been summarized for questions that did not provide a multiple-choice answer or that required an explanation.

PUBLIC SURVEY RESULTS

1. Please state the jurisdiction (city or community) where you reside.[1]

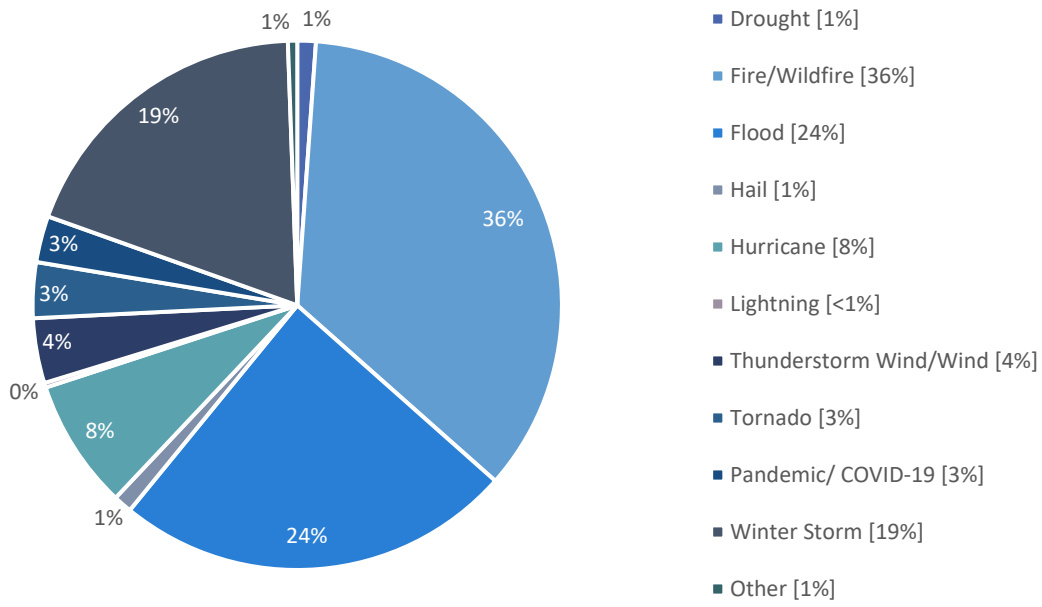


2. Have you ever experienced or been impacted by a disaster?

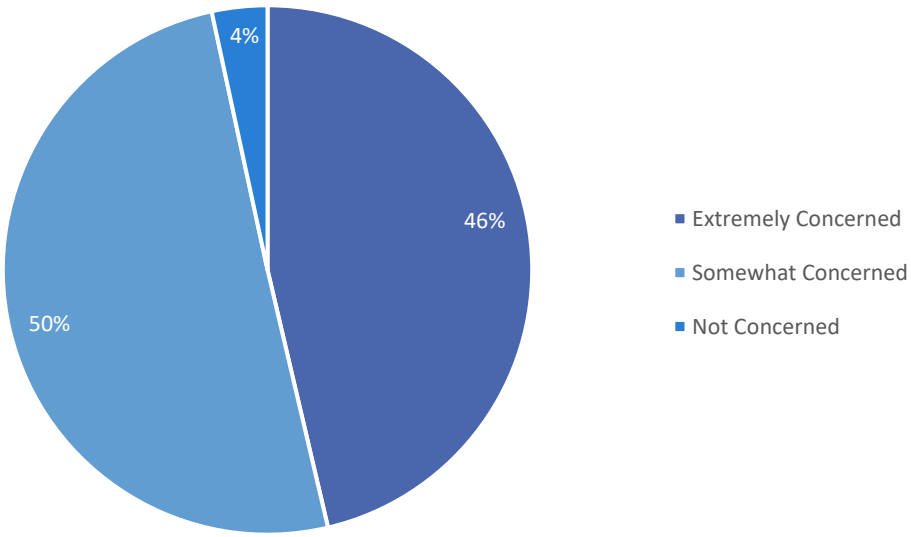


[1] Some respondents were in neighboring counties, however due to their proximity to Bastrop County, their responses were included in the survey results. This ISDs and Special Districts are represented within the geographic location in which they are located.

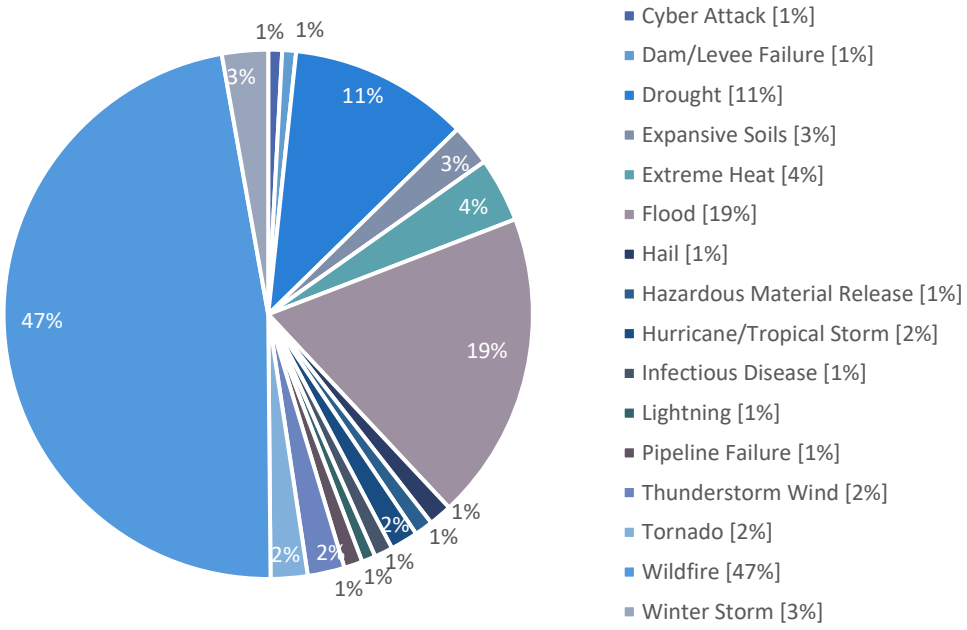
3. If you answered “Yes” to Question #2, please explain.



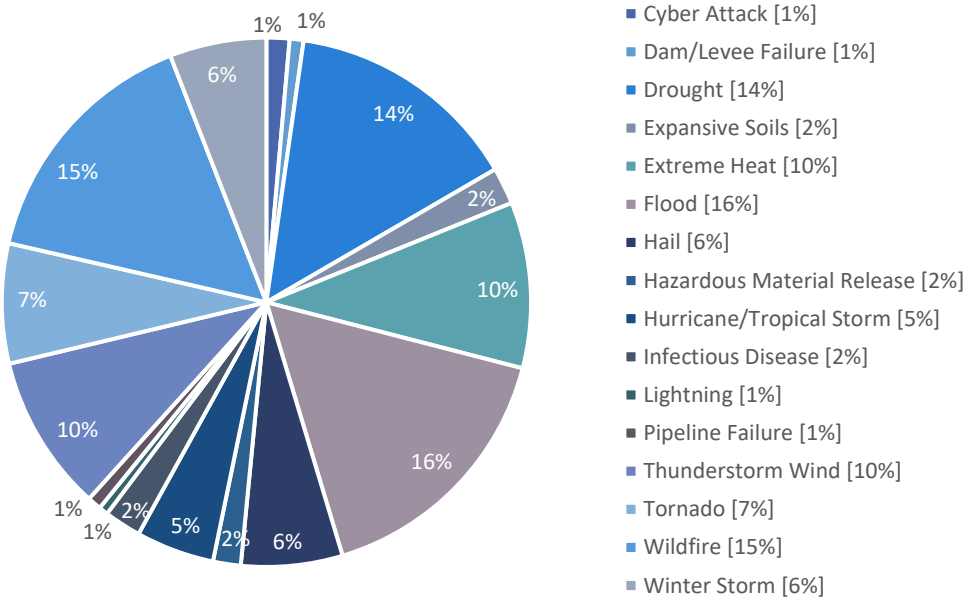
4. How concerned are you about the possibility of your community being impacted by a disaster?



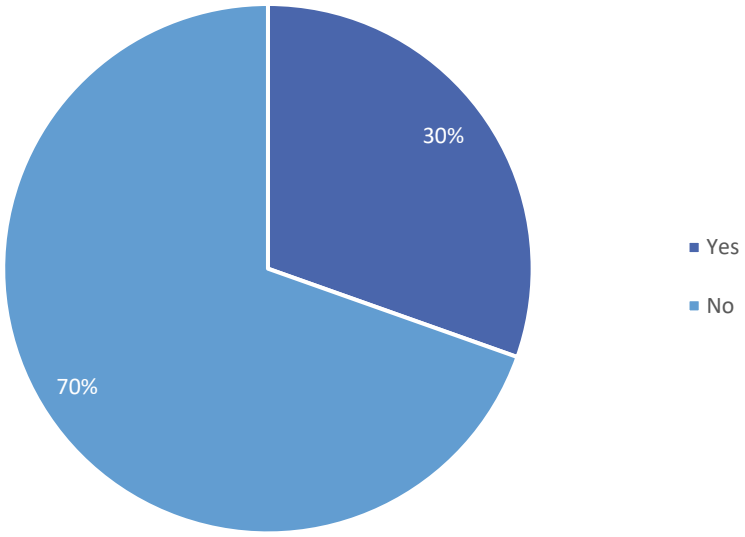
5. Please select the one hazard you think is the highest threat to your neighborhood:



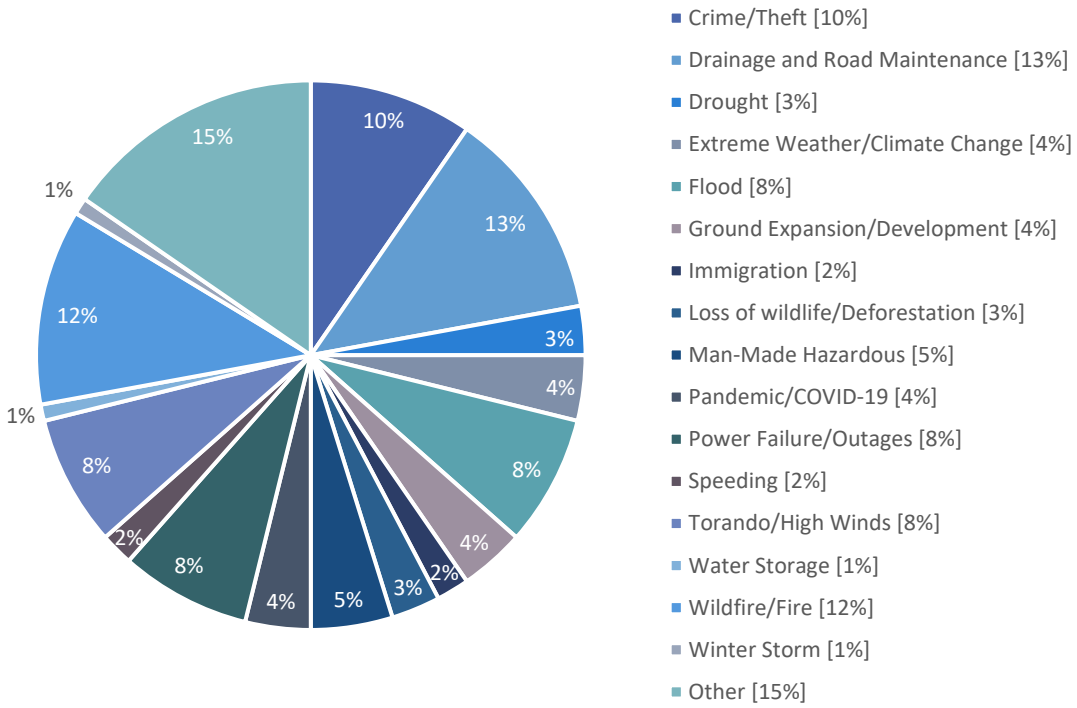
6. Please select the one hazard you think is the second highest threat to your neighborhood:



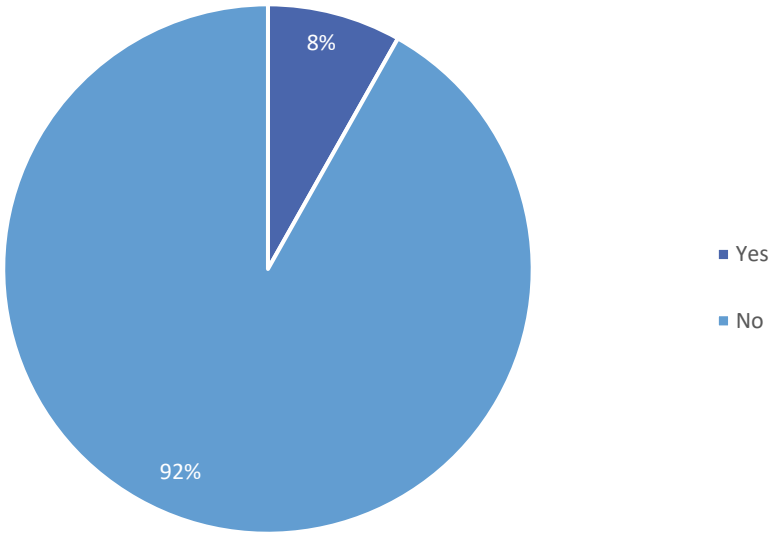
7. Is there another hazard not listed above that you this is a wide-scale threat to your neighborhood?



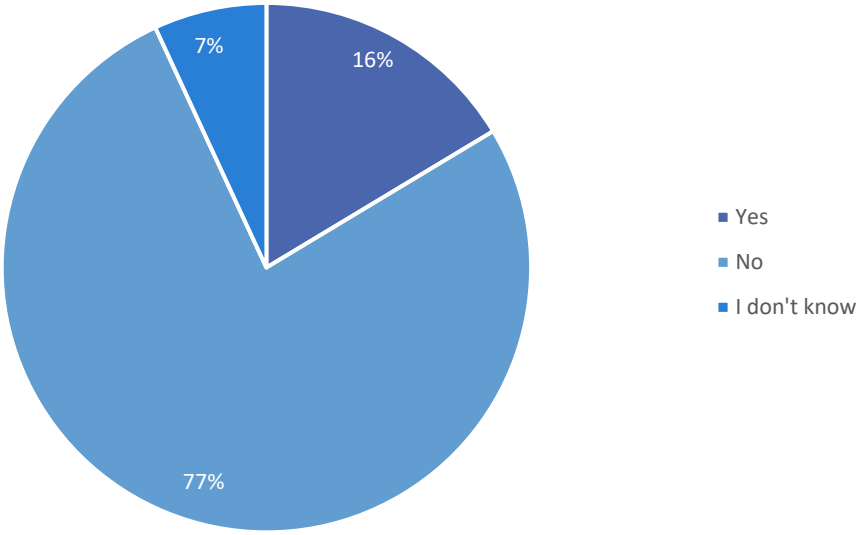
8. If you answered “Yes” to Question #7, please explain.



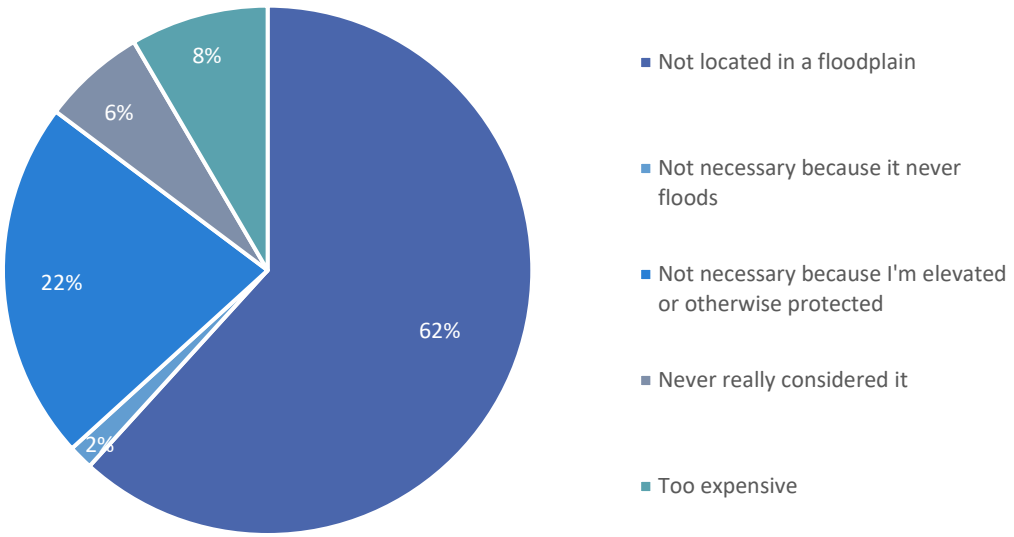
9. Is your home located in a floodplain?



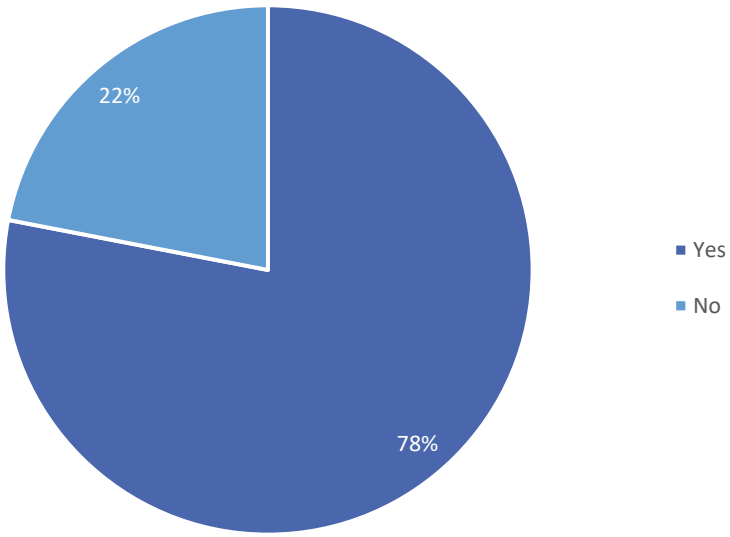
10. Do you have flood insurance?



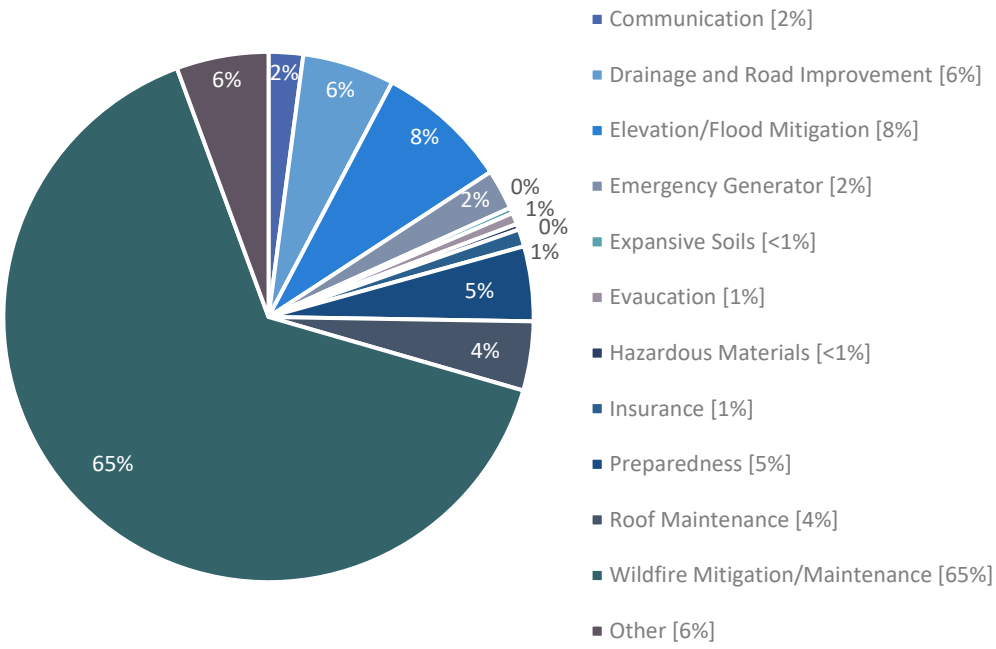
11. If you do not have flood insurance, why not?



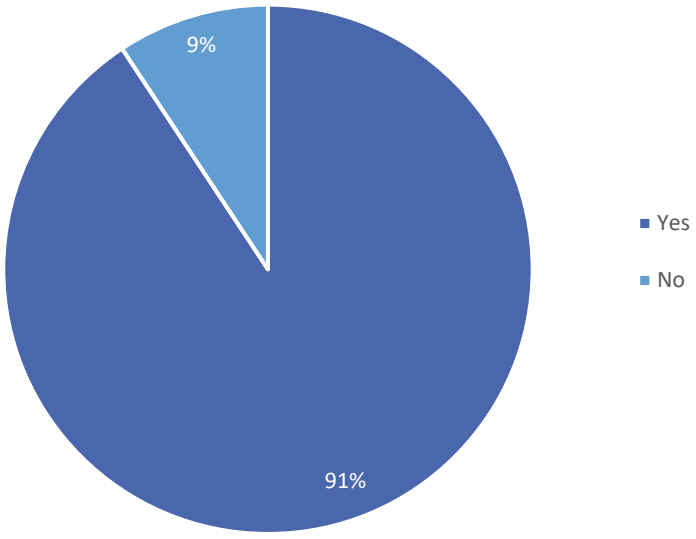
12. Have you taken any actions to make your home or neighborhood more resistant to hazards?



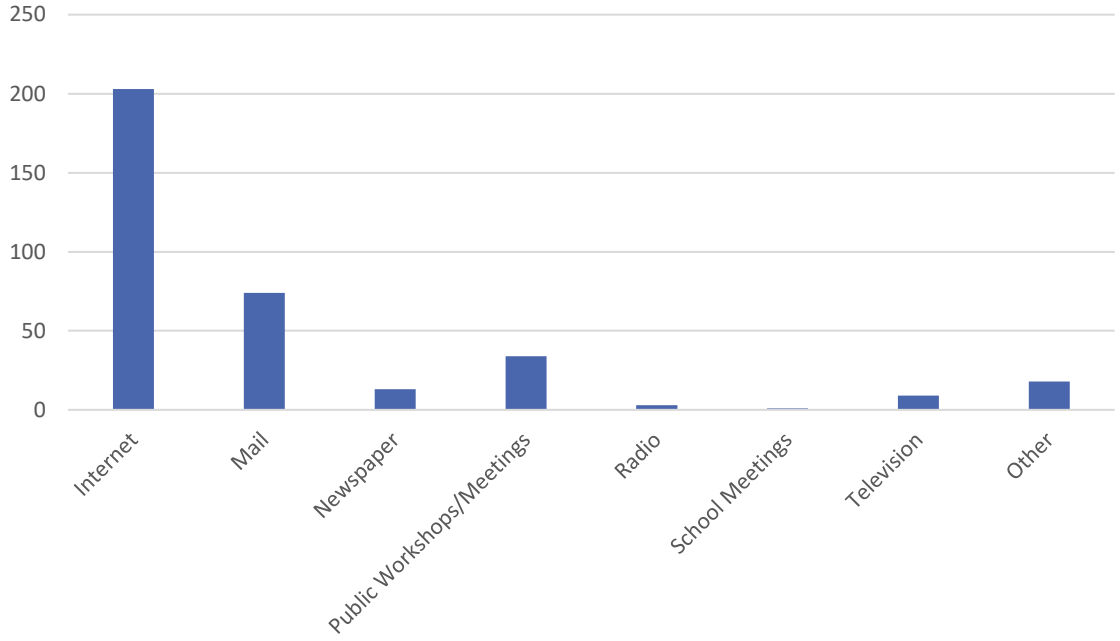
13. If you answered “Yes” to Question #12, please explain.



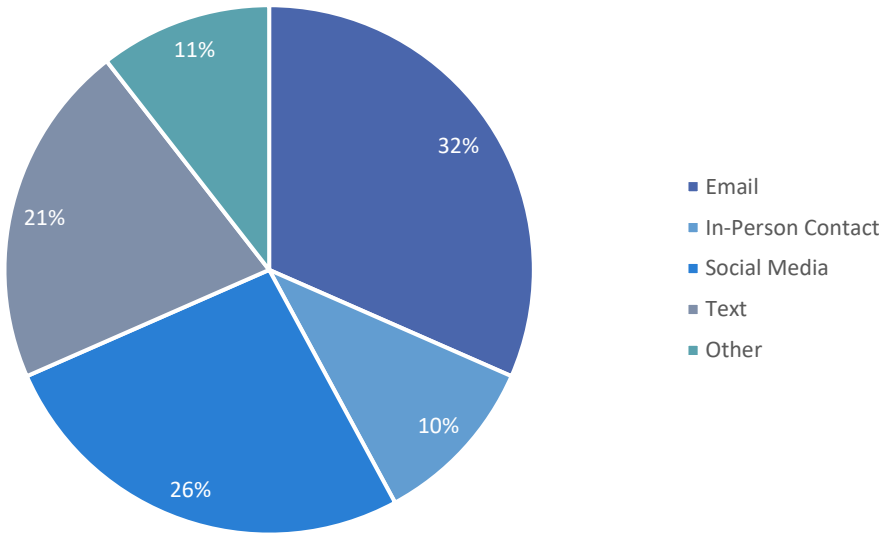
14. Are you interested in making your home or neighborhood more resistant to hazards?



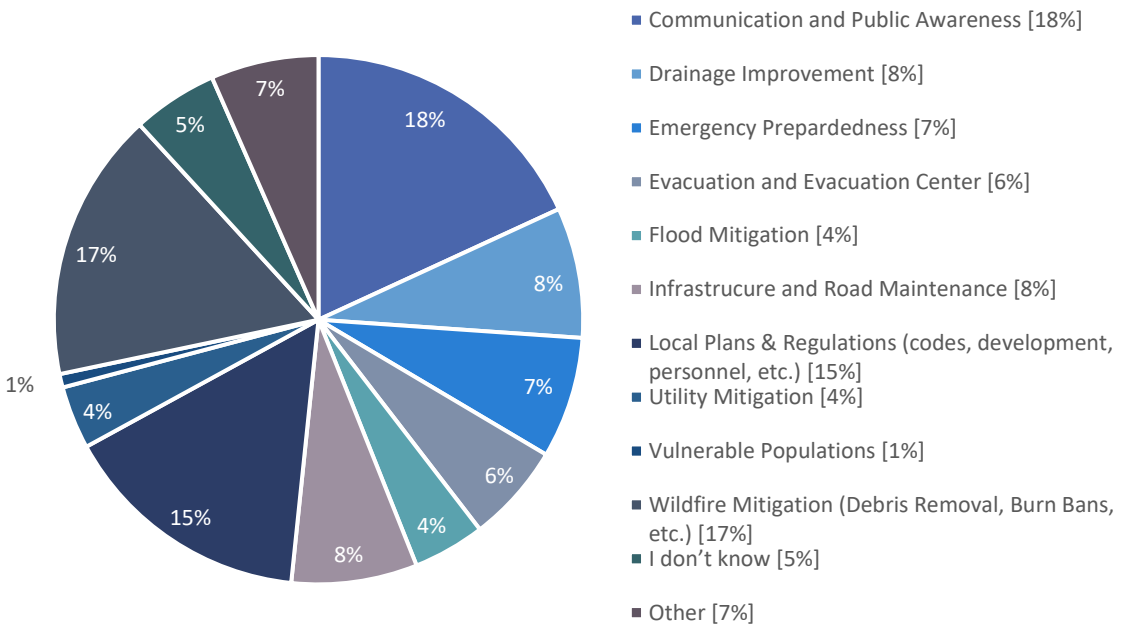
15. What is the most effective way for you to receive information about how to make your home and neighborhood more resistant to hazards?



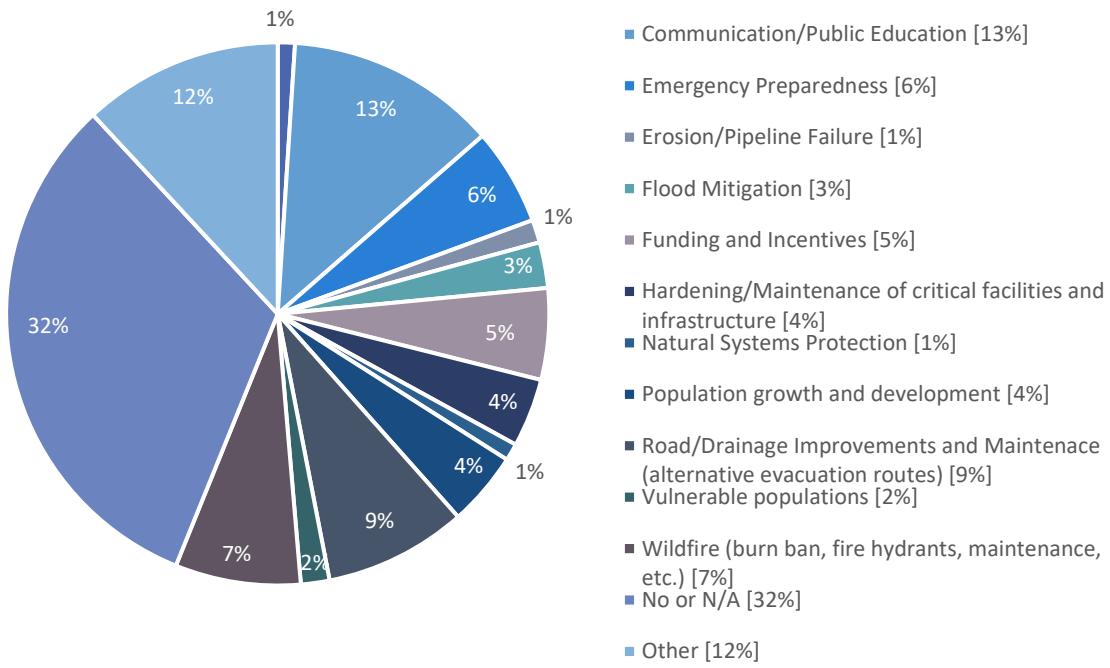
16. If you answered “Other” to Question #15, please explain.



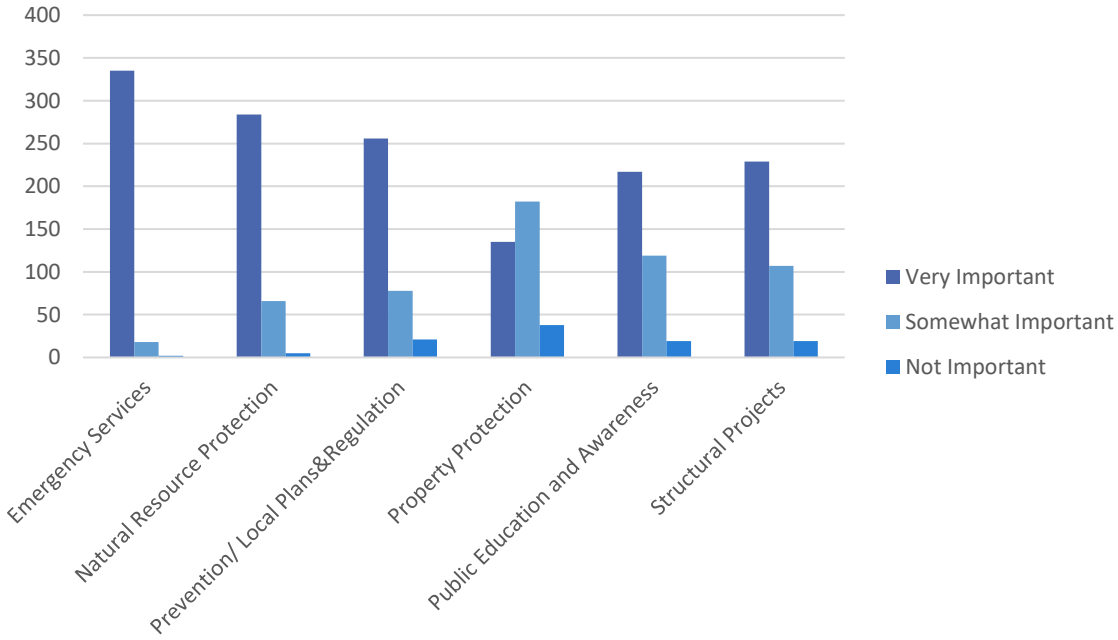
17. In your opinion, what are some steps your local government could take to reduce or eliminate the risk of future hazard damages in your neighborhood?



18. Are there any other issues regarding the reduction of risk and loss associated with hazards or disaster in the community that you think are important?



19. A number of community-wide activities can reduce our risk from hazards. In general, these activities fall into one of the following six broad categories. Please tell us how important you think each one is for your community to consider pursuing.



Emergency Services - Actions that protect people and property during and immediately after a hazard event. Examples include warning systems, evacuation planning, emergency response training, and protection of critical facilities or systems.

Natural Resource Protection - Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. Examples include floodplain protection, habitat preservation, slope stabilization, riparian buffers, and forest management.

Prevention / Local Plans & Regulations - Administrative or regulatory actions that influence the way land is developed and buildings are built. Examples include planning and zoning, building codes, open space preservation, and floodplain regulations.

Property Protection - Actions that involve the modification of existing buildings to protect them from a hazard or removal from the hazard area. Examples include acquisition, relocation, elevation, structural retrofits, and storm shutters.

Public Education and Awareness - Actions to inform citizens about hazards and techniques they can use to protect themselves and their property. Examples include outreach projects, school education programs, library materials, and demonstration events.

Structural Projects - Actions intended to lessen the impact of a hazard by modifying the natural progression of the hazard. Examples include dams, levees, seawalls detention / retention basins, channel modification, retaining walls, and storm sewers.

APPENDIX C: CRITICAL FACILITIES

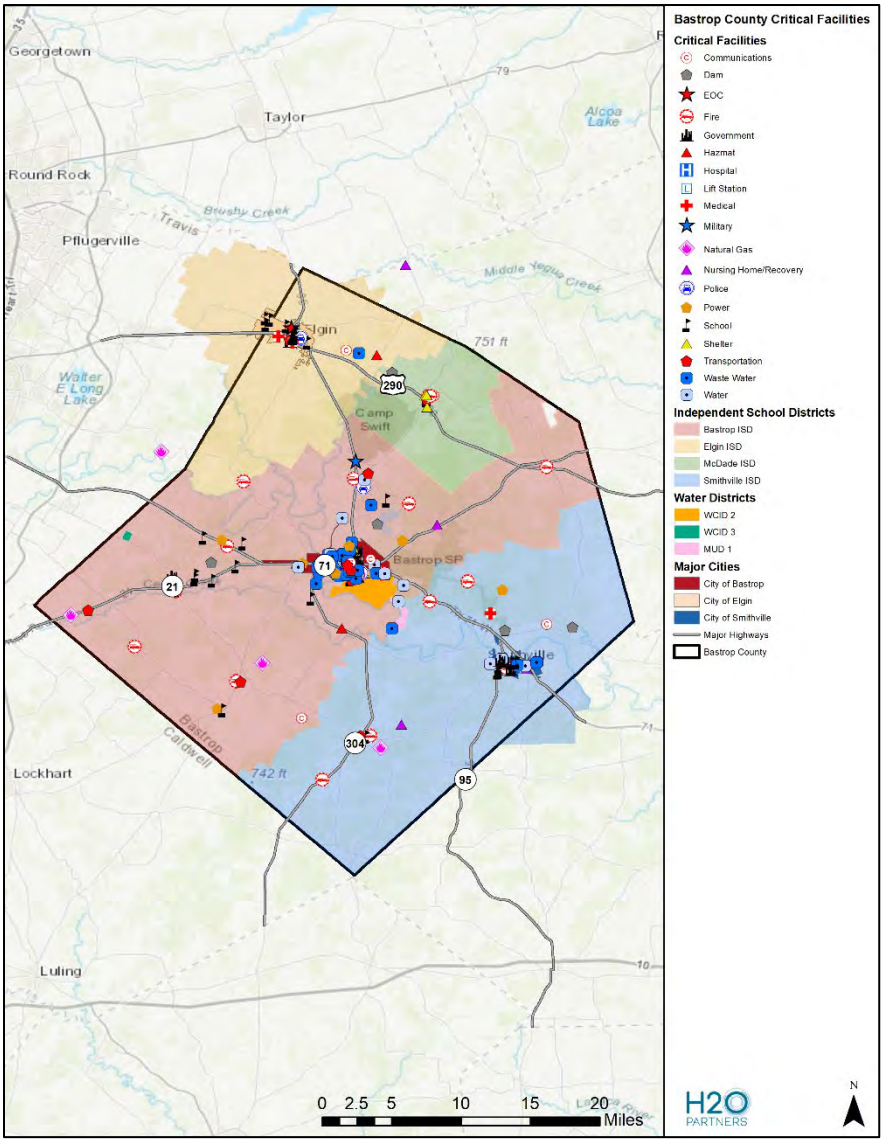
Overview 1
Critical Facilities 1

OVERVIEW

This Appendix is **For Official Use Only (FOUO)** and may be exempt from public release under FOIA. Figures C-1 through C-11 locate all critical facilities that were included in the risk assessment. Mapped facilities were provided by Planning Team members. Tables C-1 through C-11 note the critical facilities by type.

CRITICAL FACILITIES

Figure C-1. Critical Facilities in Bastrop County



APPENDIX C: CRITICAL FACILITIES

Table C-1. Critical Facilities by Type in Bastrop County

TYPE	NUMBER
Animal Shelter	1
Cancer Research Facilities	2
Communications	7
County 911 Dispatch	1
County Offices	3
County Courthouse / Annex	5
Dam	35
Detention Center	1
Educational Facilities / School	4
Electric Cooperative	3
Emergency Operations Center	1
Emergency Services	1
Federal Prison	1
Fire Department	13
Gas Storage Facility	1
Hazardous Material Facility	2
Living / Residential Facilities for Vulnerable Populations	4
Medical Emergency Center / Services	4
Military Training Facility	1
Pipeline Transport Facility	1
Power Distribution Facility	1
Power Plant / Generation	2
Propane Distribution Facility	2
Rail Yard Facility	1
Road & Bridge Equipment Storage Facility	4
School Bus Transport	1

APPENDIX C: CRITICAL FACILITIES

TYPE	NUMBER
Sheriff's Office	1
Texas Department of Transportation Transport Programs	2
Wastewater Treatment Plant	1
Water Facility	2

Figure C-2. Critical Facilities in the City of Bastrop

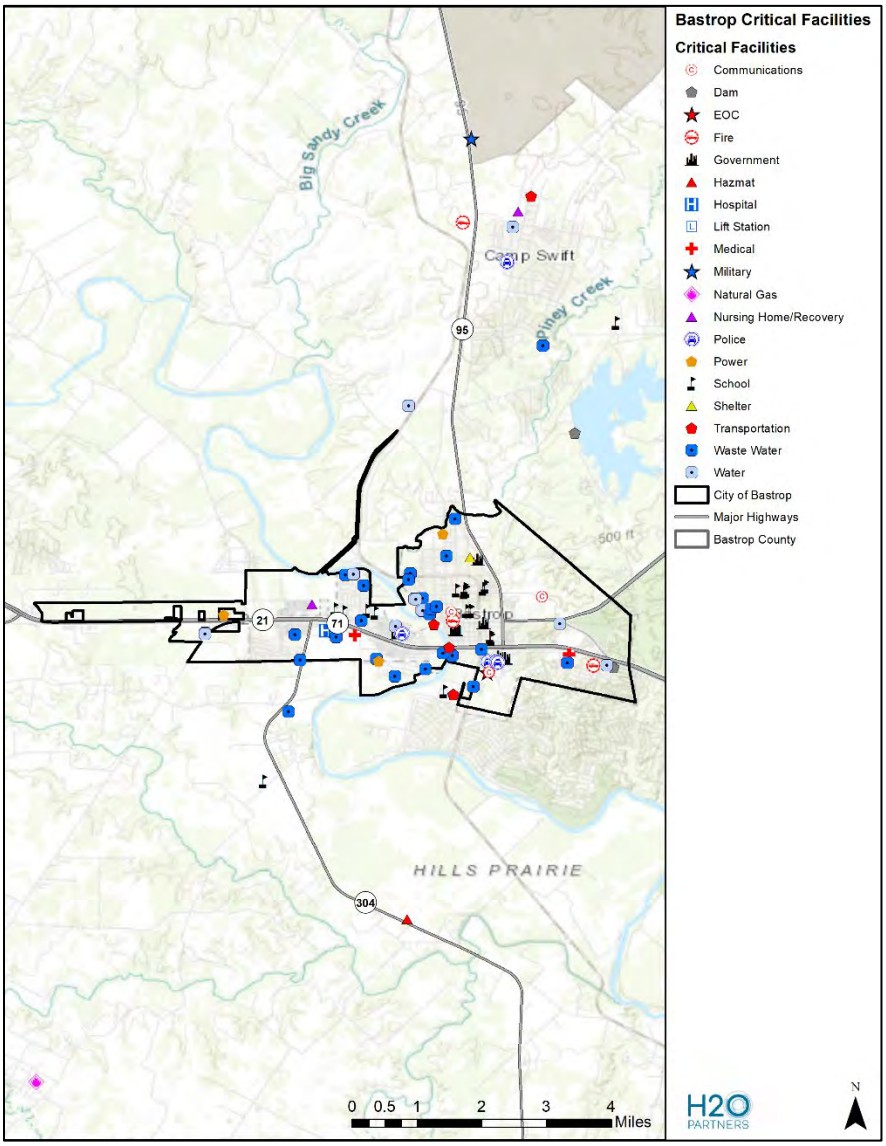


Table C-2. Critical Facilities by Type in the City of Bastrop

TYPE	NUMBER
Bridge	2
City Hall	1
Communications	2
Corrections Facility / Jail	1
Educational Facilities / School	6
Electric Substation	2
Emergency Shelter	1
Fire Department	2
Medical Emergency Center / Services	2
Police Department / 911 Center	2
Public Works Equipment Storage Facility	1
Wastewater Life Station	19
Wastewater Plant	2
Water Treatment Facility	2
Water Well / Infrastructure	12

Figure C-3. Critical Facilities in the City of Elgin

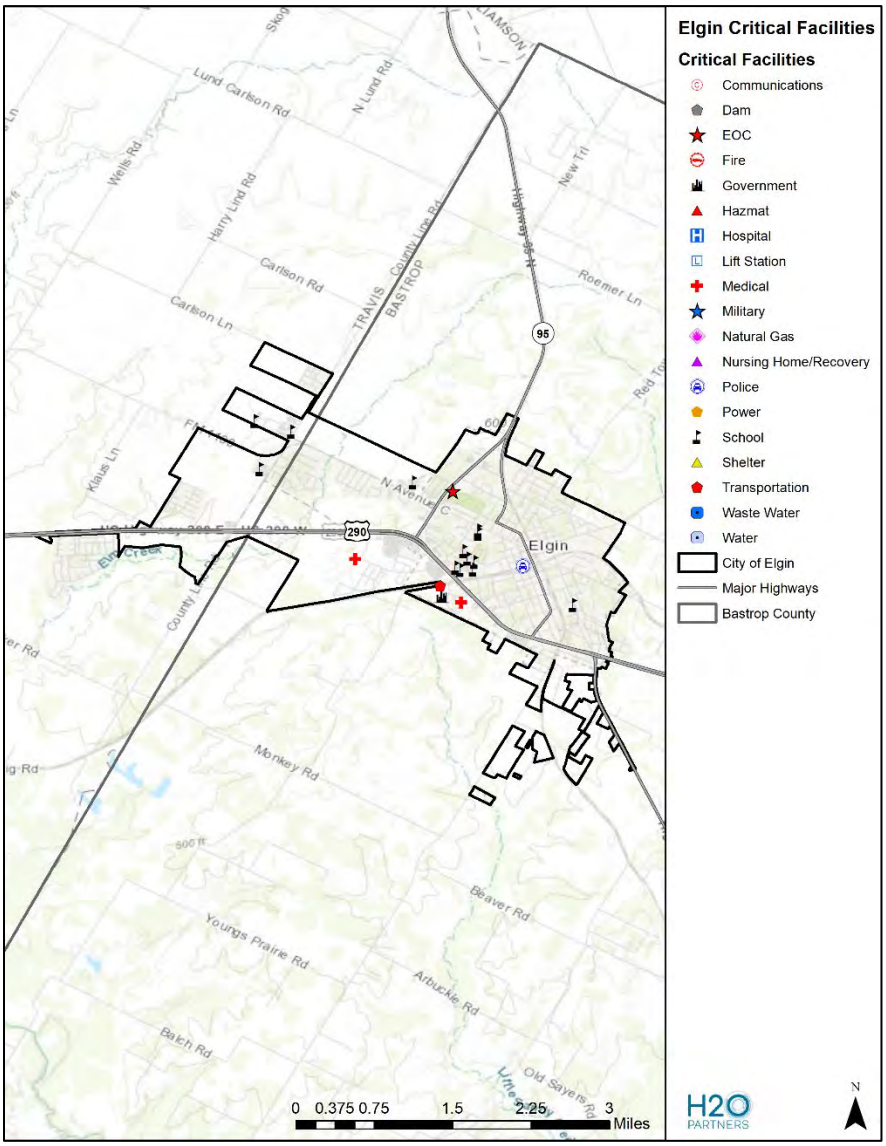


Table C-3. Critical Facilities by Type in the City of Elgin

TYPE	NUMBER
Emergency Evacuation Center	1
Helicopter Landing Pad	1
Medical Emergency Center / Services	1
Police Department	1
Volunteer Fire Department	1
Water Treatment Plant	1

Figure C-4. Critical Facilities in the City of Smithville

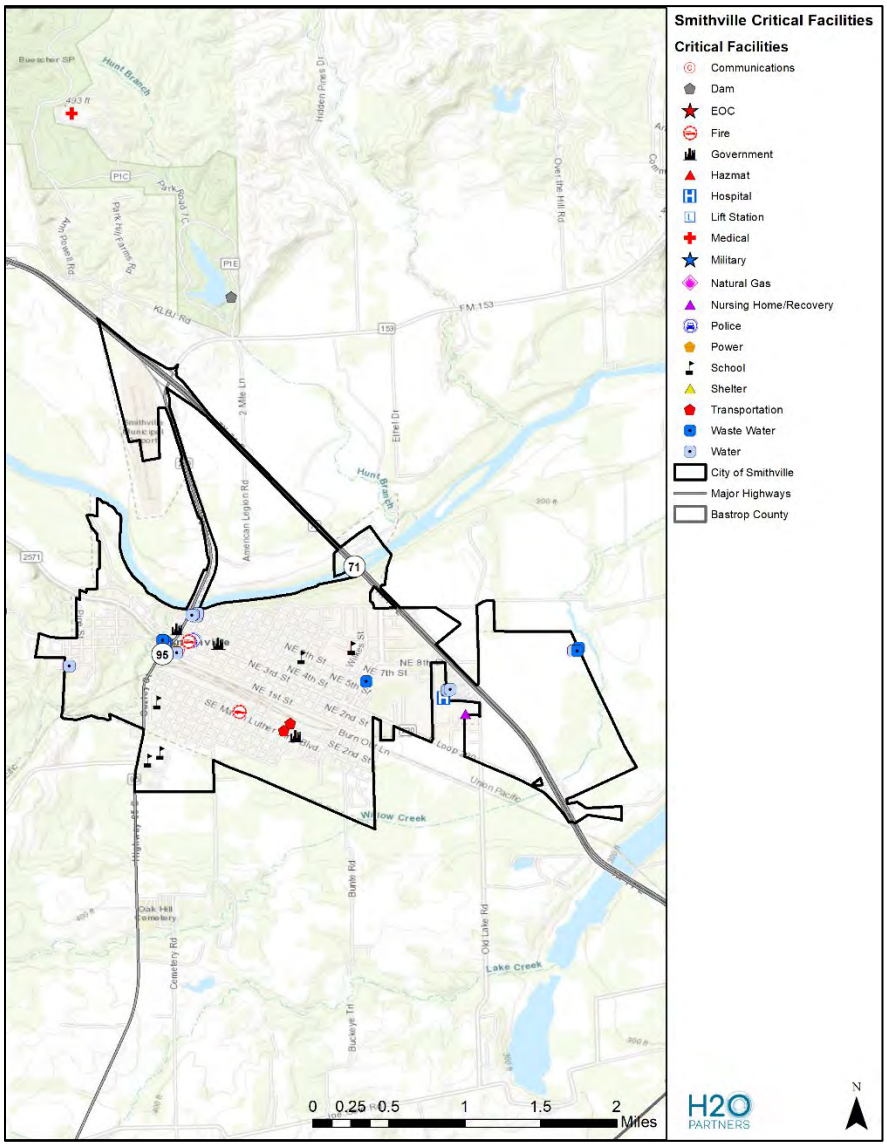


Table C-4. Critical Facilities by Type in the City of Smithville

TYPE	NUMBER
Airport	1
City Hall	1
City Storage Facility	1
Chemical Laboratory	1
Communication Tower	1
Fire Department	2

Generator	1
Police Department	1
Pumps	3
Pump House	1
Pump Station	1
Recreation Center	1
Treatment Facility	1
Wells	3
Wastewater Treatment Facility	2
Water Standpipe	1
Water System Building	1
Water Tank	3
Water Tower	2

Figure C-5. Critical Facilities in Bastrop ISD

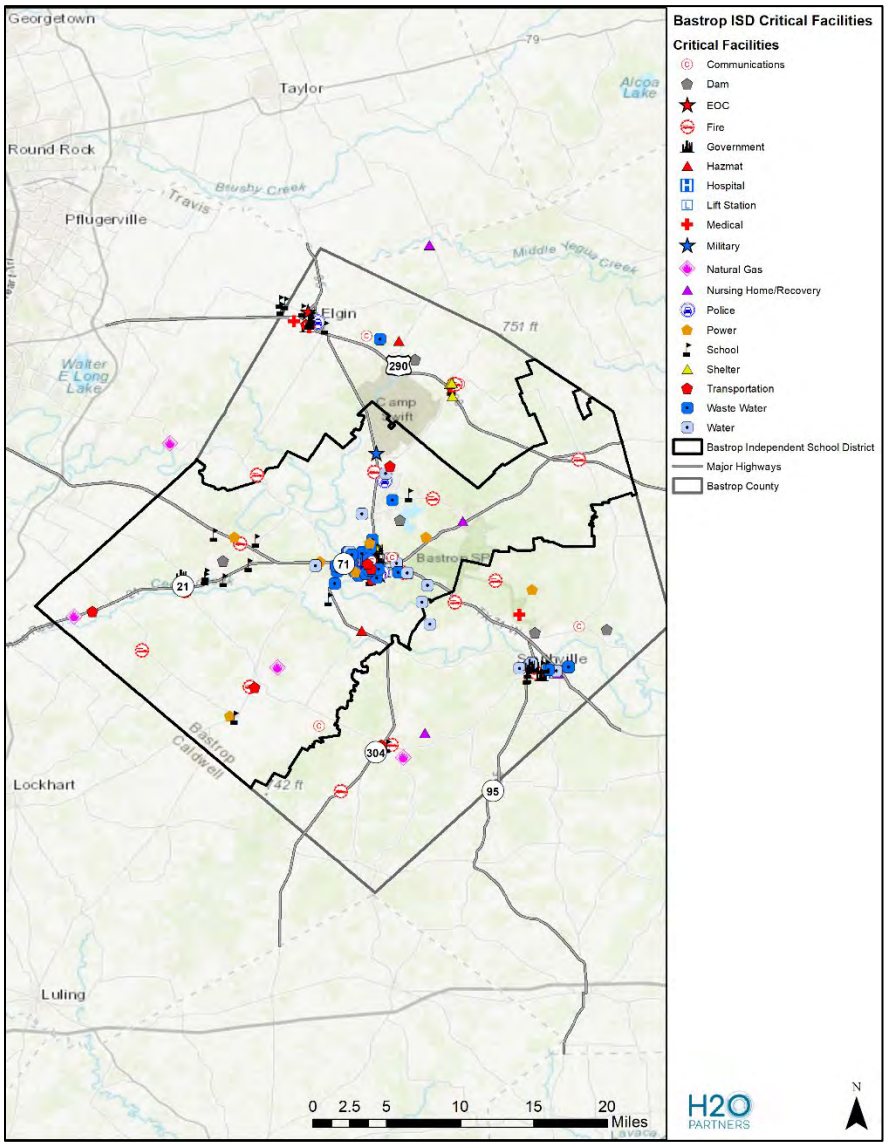


Table C-5. Critical Facilities by Type in Bastrop ISD

TYPE	NUMBER
Alternative Education Program	1
Elementary School	6
High School	3
Intermediate School	2
Middle School	2
Police Department	1

APPENDIX C: CRITICAL FACILITIES

TYPE	NUMBER
Service Center	1
Stadium	1
Technology Building	1
Transportation	1

Figure C-6. Critical Facilities in Elgin ISD

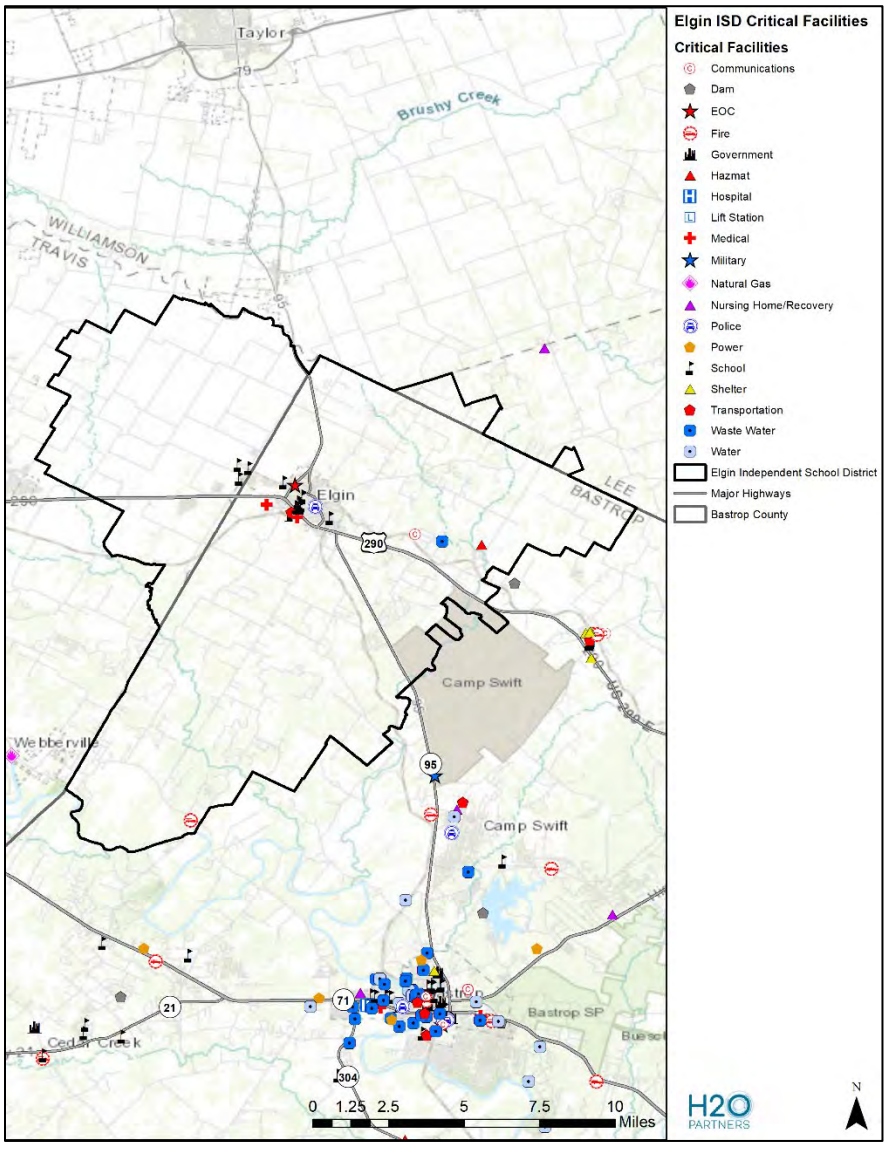


Table C-6. Critical Facilities by Type in Elgin ISD

TYPE	NUMBER
Administration Building	1
Development Center	1
Elementary School	3
High School	2
Intermediate School	1
Maintenance and Operations Facility	1
Middle School	1
Nutrition Services / Facility	1
Technology Building	1
Transportation Department	1

Figure C-7. Critical Facilities in McDade ISD

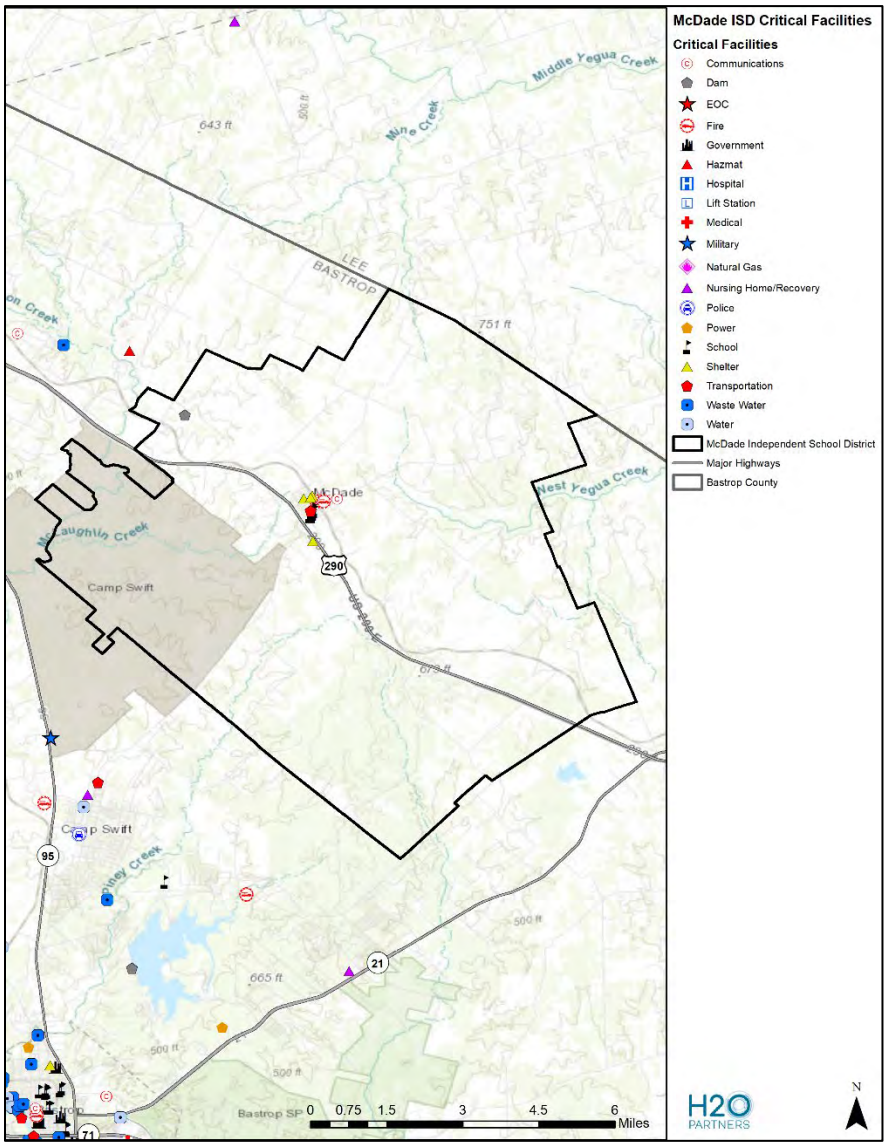


Table C-7. Critical Facilities by Type in McDade ISD

TYPE	NUMBER
Administration Building	2
AG Shop / Facility	2
Athletic Office	1
Band Hall	1
Church	4
Elementary School	2

APPENDIX C: CRITICAL FACILITIES

TYPE	NUMBER
High School	1
Maintenance Facility / Storage	1
Middle School	1
Volunteer Fire Department	1
Water District	1

Figure C-8. Critical Facilities in Smithville ISD

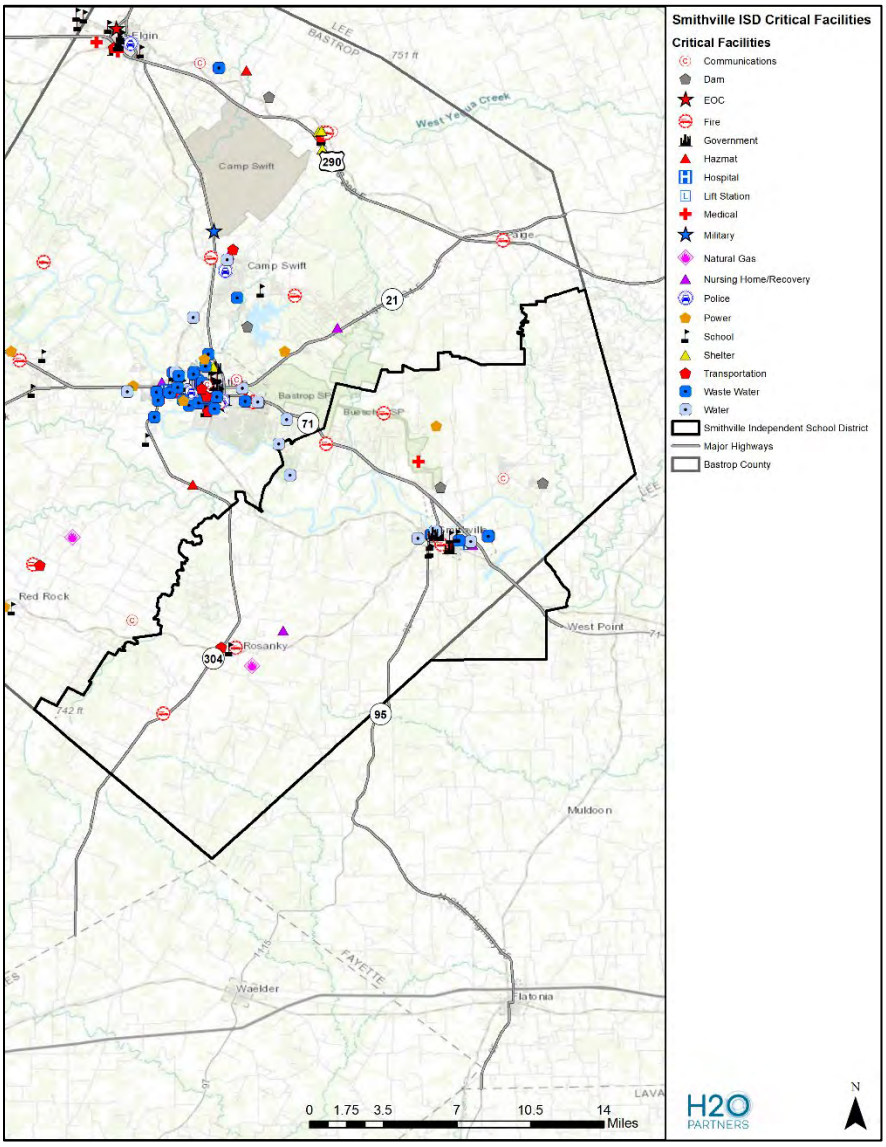


Table C-8. Critical Facilities by Type in Smithville ISD

TYPE	NUMBER
Administrative Building	1
Elementary School	1
High School	1
Junior High School	1
Maintenance Warehouse	1
Primary School	1

Figure C-9. Critical Facilities in Bastrop County MUD#1

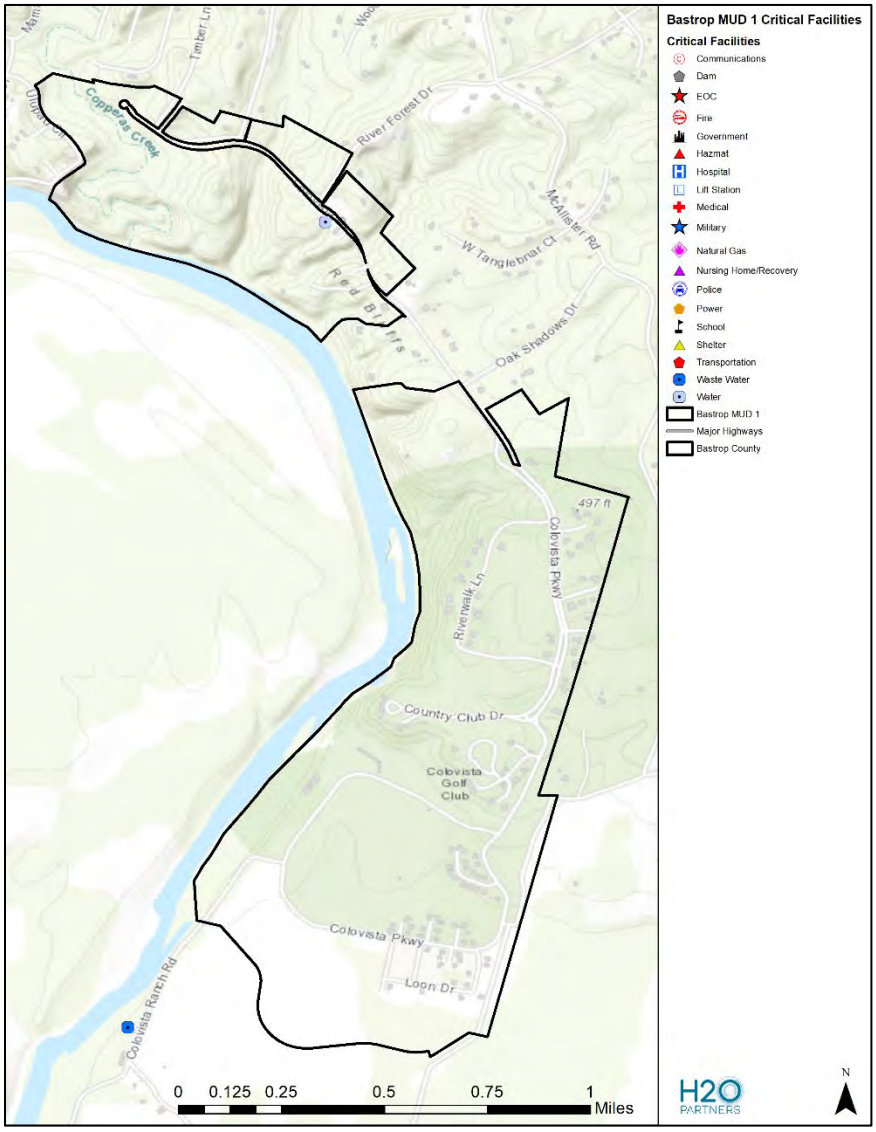


Table C-9. Critical Facilities by Type in Bastrop County MUD#1

TYPE	NUMBER
AWR Services Office	1
District Water and Wastewater Operation Center	1
Operations and Maintenance Firm	1
Wastewater Plant	1
Water Plant	1
Water Pipelines / Sewerage	1
Water Source / Aqua WSC	1

Figure C-10. Critical Facilities in Bastrop County WCID #2

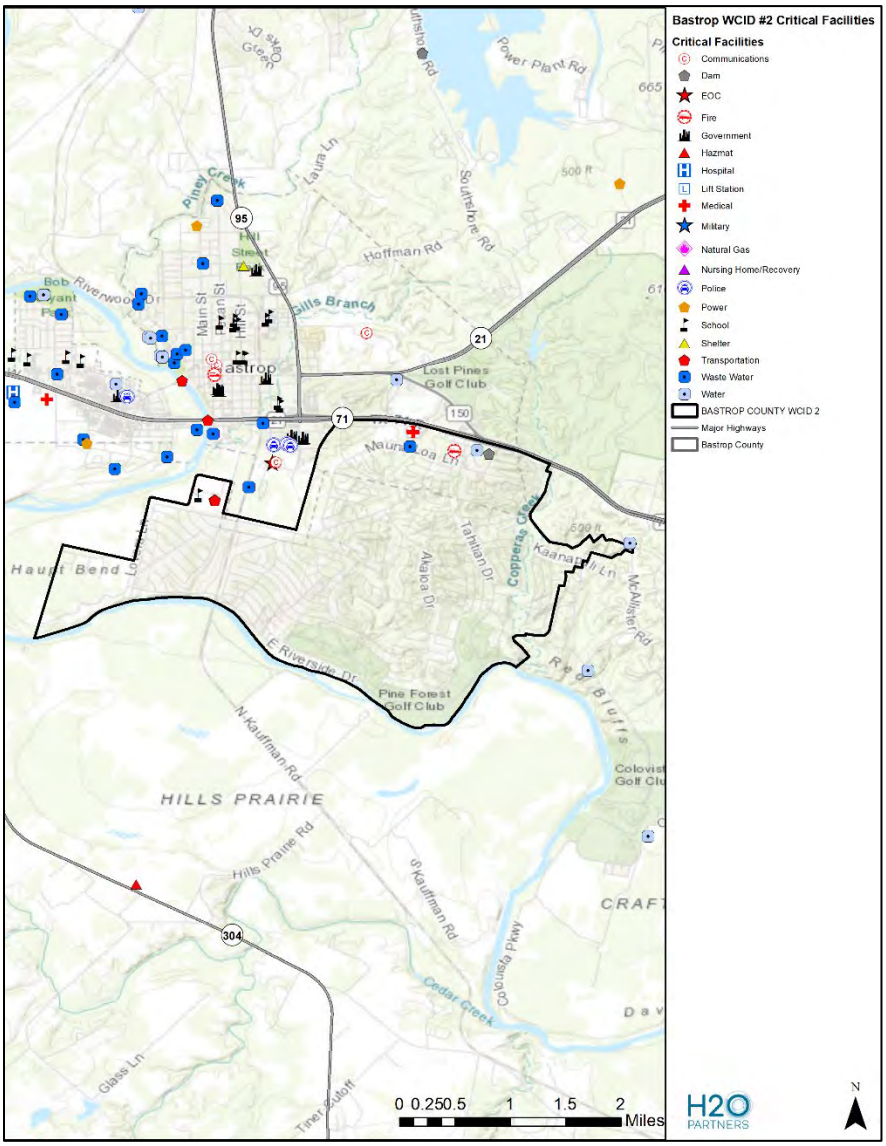


Table C-10. Critical Facilities by Type in Bastrop County WCID #2

TYPE	NUMBER
Water Well / Pumping Station	1

Figure C-11. Critical Facilities in Bastrop County WCID #3

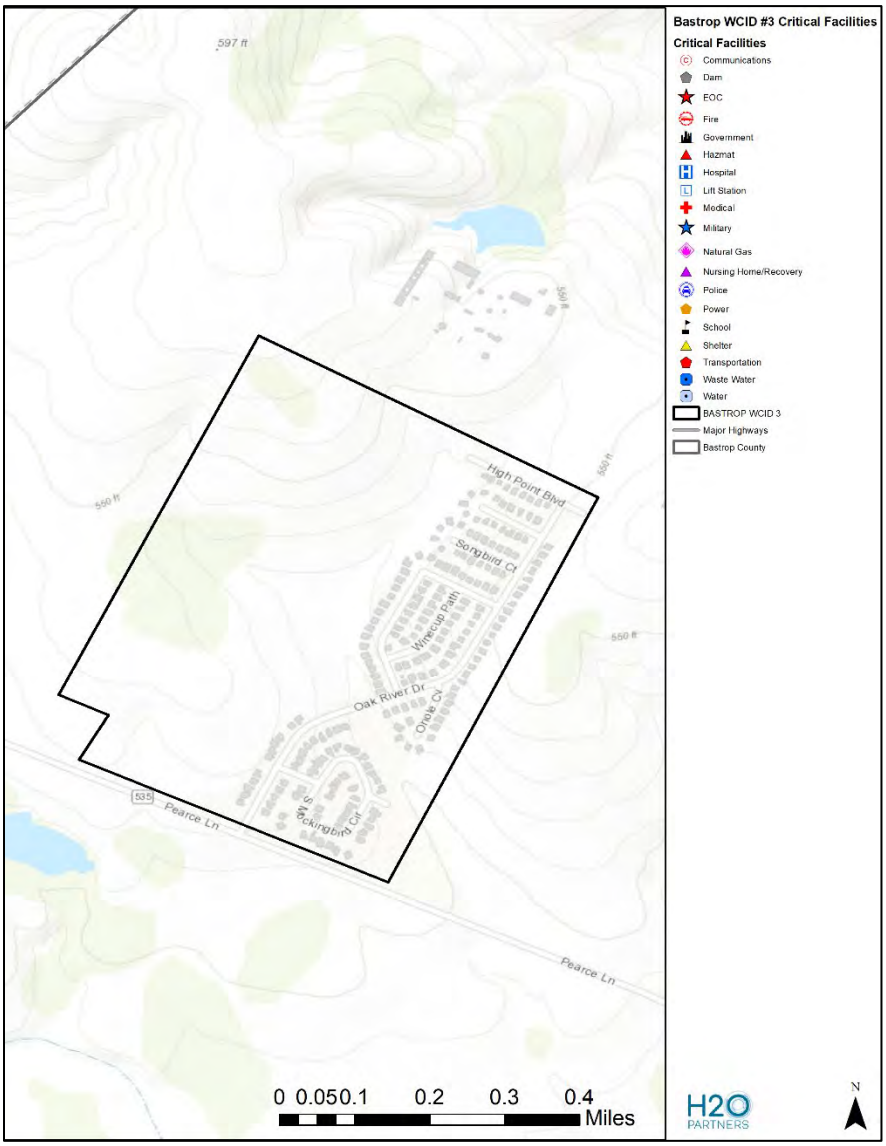


Table C-11. Critical Facilities by Type in Bastrop County WCID #3

TYPE	NUMBER
No critical facilities were identified by the WCID #3	

APPENDIX D: DAM LOCATIONS

Overview 1
Dam Locations 1

OVERVIEW

Appendix D is **For Official Use Only (FOUO)** and may be exempt from public release under the Freedom of Information Act (FOIA).

DAM LOCATIONS

Table D-1 below reflects all dams that are located in the participating jurisdictions within the Bastrop County Hazard Mitigation Action Plan Update. This list includes High, Significant, and Low Hazard Dams. Section 15 of the Plan doesn't profile dams that were deemed to pose no past, current, or future risk to the planning area as no loss of life or impact to critical facilities or infrastructure is expected in the event of a breach. The asterisk denotes those that were profiled in the hazard assessment.

Table D-1. List of Dam Locations and Storage Capacities

JURISDICTION	LATITUDE	LONGITUDE	HEIGHT (Feet)	STORAGE (Acre Feet)
Bastrop County	30.117595	-97.135148	32	764
Bastrop County*	30.045106	-97.088047	36	822
Bastrop County	30.088597	-97.238402	18	120
Bastrop County	30.059822	-97.110822	21	290
Bastrop County	30.25434	-97.088892	18	150
Bastrop County	29.868735	-97.290937	38	1,163
Bastrop County	30.180842	-97.29309	21.2	119
Bastrop County	30.175201	-97.259645	16	118
Bastrop County	30.139538	-97.227182	22	435
Bastrop County	30.206873	-97.169778	20	1,112
Bastrop County	30.070902	-97.48244	20	112
Bastrop County	29.913986	-97.444223	24	204
Bastrop County	30.014098	-97.340091	20	160
Bastrop County	30.000773	-97.217232	21	284
Bastrop County	30.005558	-97.219048	35	418

APPENDIX D: DAM LOCATIONS

JURISDICTION	LATITUDE	LONGITUDE	HEIGHT (Feet)	STORAGE (Acre Feet)
Bastrop County	30.071157	-97.10642	18	80
Bastrop County	30.042737	-97.084327	31	423
Bastrop County	30.071042	-97.297933	27	20
Bastrop County	30.07368	-97.114197	20	56
Bastrop County	30.063316	-97.102346	12	95
Bastrop County	30.082476	-97.188725	21	50
Bastrop County	30.196422	-97.325076	18	37
Bastrop County	30.177027	-97.256316	16	48
Bastrop County*	30.112693	-97.464788	19	350
Bastrop County	30.037687	-97.55522	32	155
City of Bastrop	30.154123	-97.300588	15	96
City of Bastrop*	30.152838	-97.291342	88	24,700
City of Elgin	30.310667	-97.276253	19	259
City of Smithville	30.042138	-97.158417	26	250
City of Smithville	30.1004	-97.282636	33	84
City of Smithville	30.066491	-97.574237	18	200
City of Smithville*	29.959187	-97.313958	35	1200
City of Smithville	30.018628	-97.220605	37	252
City of Smithville	30.013332	-97.333332	17	86
City of Smithville	30.046567	-97.31177	30	24

APPENDIX E: MEETING DOCUMENTATION

Workshop Documentation 1
Public Meeting Documentation 4
Public Notices 8

WORKSHOP DOCUMENTATION

Appendix E is **For Official Use Only (FOUO)** and may be exempt from public release under the Freedom of Information Act (FOIA).

Bastrop County held a series of Planning Team workshops: a Kickoff Workshop on June 3rd, 2021, a Risk Assessment Workshop September 23rd, 2021, and a Mitigation Strategy Workshop on November 17th, 2021. At each of these workshops members of the Planning Team were informed of the planning process, expressed opinions, and volunteered information. Bastrop County hosted public meetings. The sign-in sheets for each workshop and public meeting are included below. For more details on the workshops and planning process, see Section 2.

Figure E-1. Bastrop County Kickoff Workshop, June 3rd, 2021

BASTROP COUNTY HAZARD MITIGATION PLAN
Kickoff Workshop
Adobe Connect Webinar
June 3rd, 2021

Name	Jurisdiction	Title	Email	Phone
Christine Files	Bastrop County	EMC	christine.files@co.bastrop.tx.us	512-332-6837
Carolyn Dill	Bastrop County	County Engineer	carolyn.dill79@co.bastrop.tx.us carolyn.dill@co.bastrop.tx.us	512-581-7180
James Altgelt	Bastrop County	Ass. EMC	james.altgelt@co.bastrop.tx.us	512-718-3624
Rachel Etheredge	Bastrop County	Ass. Auditor	rachel.etheredge@gmail.com	979-540-9877
Abram Barker	Bastrop County	Floodplain Administrator	abram.barker@co.bastrop.tx.us	512-581-7159
Mark Meuth	Bastrop County Pct. 3	County Commissioner	mark.meuth@co.bastrop.tx.us	512-581-4000
Trey Job	City of Bastrop	Ass. City Manager	tjob@cityofbastrop.org	512-332-8932
Paul Hofmann	City of Bastrop	City Manager	phofmann@cityofbastrop.org	512-629-2160
Andres Rosales	City of Bastrop	Fire Chief	arosales@cityofbastrop.org	512-629-2163
Thomas Mattis	City of Elgin	City Manager	tmattis@ci.elgin.tx.us	512-661-8392
Chris Noble	City of Elgin	Chief of Police	cnoble@pd.ci.elgin.tx.us	512-285-6811

BASTROP COUNTY HAZARD MITIGATION PLAN
Kickoff Workshop
Adobe Connect Webinar
June 3rd, 2021

Name	Jurisdiction	Title	Email	Phone
Jack Page	City of Smithville	Public Director	Jpage@ci.smithville.tx.us	512-848-6539
Robert Tamble	City of Smithville	City Manager	citymanager@ci.smithville.tx.us	512-423-9390
Scott Bunch	Bastrop ISD	Director of Safety and Security	Sbunch@bisdtx.org	850-464-7095
Jodi Duron	Elgin ISD	Superintendent	jodi.duron@elginisd.net	512-281-9731
Matthew West	Elgin ISD	Director of Safety and Risk Management	matthew.west@elginisd.net	512-285-9245
Barbara Marchbanks	McDade ISD	Superintendent	barbara.marchbanks@mcdadeisd.net	512-273-2522
David Edwards	Smithville ISD	Director of State & Federal Programs	dedwards@smithvilleisd.org	512-237-2487
Nick Textor	MUD#1	Past President	nick.textor@austin.rr.com	773-680-0990
Jeff Hewitt	WCID#3	Director	jeffhewitt@bastropwcid3.org	512-779-5459
Josh Gill	ESD#2	Fire Chief	chief@bastropesd2.org	512-332-6366

BASTROP COUNTY HAZARD MITIGATION PLAN
Kickoff Workshop
Adobe Connect Webinar
June 3rd, 2021

Name	Jurisdiction	Title	Email	Phone
Shelia Lowe	Bastrop County Long Term Recovery Team	Executive Director	ed@bcltrt.org	512-521-3001
Rhonda Murphy	H2O Partners Inc	Sr. Mitigation Specialist	rmurphy@h2opartnersusa.com	512-571-2088
Heidi Watson	H2O Partners Inc	Mitigation Specialist	heidi@h2opartnersusa.com	512-568-2259
Stevie-Ann Hodgson-O'Donnell	H2O Partners Inc	Project Specialist	shodgson@h2opartnersusa.com	631-708-4491

Figure E-2. Bastrop County Risk Assessment Workshop, September 23rd, 2021

BASTROP COUNTY HAZARD MITIGATION PLAN
Risk Assessment Workshop
Adobe Connect Webinar
September 23rd, 2021

Name	Jurisdiction	Title	Email	Phone
Christine Files	Bastrop County	EMC	christine.files@co.bastrop.tx.us	512-332-6837
Carolyn Dill	Bastrop County	County Engineer	carolyn.dill79@co.bastrop.tx.us carolyn.dill@co.bastrop.tx.us	512-581-7180
James Altgelt	Bastrop County	Ass. EMC	james.altgelt@co.bastrop.tx.us	512-718-3624
Abram Barker	Bastrop County	Floodplain Admin.	Abram.barker@co.bastrop.tx.us	512-581-7159
Clara Beckett	Bastrop County	Pct. 2 County Commissioner	Clara.beckett@co.Bastrop.Tx.us	512-581-4022
Mark Meuth	Bastrop County	Pct. 3 County Commissioner	mark.meuth@co.bastrop.tx.us	512-581-4003
Andres Rosales	City of Bastrop	Fire Chief	arosales@cityofbastrop.org	512-629-2163
Allison Land	City of Bastrop	Senior Planner and GIS Coordinator	aland@cityofbastrop.org	512-332-8840
Chris Noble	City of Elgin	Chief of Police	cnoble@pd.ci.elgin.tx.us	512-285-6811
Robert Tamble	City of Smithville	City Manager	citymanager@ci.smithville.tx.us	512-423-9390
Scot Bunch	Bastrop ISD	Director of Safety and Security	Sbunch@bisdtx.org	850-464-7095

BASTROP COUNTY HAZARD MITIGATION PLAN
Risk Assessment Workshop
Adobe Connect Webinar
September 23rd, 2021

Heather Stidham	McDade ISD	Interim Superintendent	heather.stidham@mcdadeisd.net	512-273-2522 ext. 1310
Matthew West	Elgin ISD	Director of Safety and Risk Management	matthew.west@elginisd.net	512-285-9245
Jane Sevier	MUD#1	Board of Directors	janiesevier@gmail.com	512-718-4621
Nick Textor	MUD #1	Previous President	nick.textor@austin.rr.com	773-680-0990
Jeff Hewitt	WCID#3	Director	jeffhewitt@bastropwcid3.org	512-779-5459
Luke Williams	Texas	Owner	nikonwill@gmail.com	n/a
Rhonda Murphy	Rhonda Murphy	Sr. Mitigation Specialist	rmurphy@h2opartnersusa.com	512-571-2088
Stevie-Ann Hodgson-O'Donnell	Rhonda Murphy	Project Specialist	shodgson@h2opartnersusa.com	631-708-4491

Figure E-3. Bastrop County Mitigation Strategy Workshop, November 17th, 2021

BASTROP COUNTY HAZARD MITIGATION PLAN
Mitigation Strategy Workshop
Adobe Connect Webinar
November 17th, 2021 10AM-11:30AM CST

Name	Jurisdiction	Title	Email	Phone
Christine Files	Bastrop County	EMC	christine.files@co.bastrop.tx.us	512-332-6837
James Altgelt	Bastrop County	Assistant EMC	james.altgelt@co.bastrop.tx.us	512-718-3624
Robert Pugh	Bastrop County	Director of Development Services	robert.pugh@co.bastrop.tx.us	512-581-4071
Mark Meuth	Bastrop County	Pct. 3 Commissioner	mark.meuth@co.bastrop.tx.us	512-581-4000
Carolyn Dill	Consulting Engineer	Bastrop County	carolyn.dill@co.bastrop.tx.us	512-581-7180
Rachel Etheredge	Bastrop County	Assistant Auditor	rachel.etheredge@co.bastrop.tx.us	512-581-7107
Allison Land	City of Bastrop	Senior Planner/GIS Coordinator	aland@cityofbastrop.org	512-332-8843
Chris Nobles	City of Elgin	Chief of Police	cnoble@pd.ci.elgin.tx.us	512-285-5757
Joanna Morgan	City of Smithville	Mayor	jmorgan@ci.smithville.tx.us	512-484-0337
Robert Tamble	City of Smithville	City Manger	citymanager@ci.smithville.tx.us	512-423-9390
Scot Bunch	Bastrop ISD	Chief	Sbunch@bisdtx.org	512-772-7143
Matthew West	Elgin ISD	matthew.west@elginisd.net	Director of Safety and Risk Management	512-285-9245
Barbara Birnbaum	McDade ISD	Admin to Assistant to the Superintendent	barbara.birnbaum@mcdadeisd.net	512-636-6569

BASTROP COUNTY HAZARD MITIGATION PLAN
Mitigation Strategy Workshop
Adobe Connect Webinar
November 17th, 2021 10AM-11:30AM CST

Terry Johnson	McDade ISD	Director of Operations	terry.johnson@mcdadeisd.net	512-273-2522 ext 1506
David Edwards	Smithville ISD	Director of State & Federal Programs	dedwards@smithvilleisd.org	512-237-2487
Jane Sevier	Bastrop County MUD #1	Executive Director	janiesevier@gmail.com	512-718-4621
Nick Textor	Bastrop County MUD #1	Former President	nick.textor@austin.rr.com	773-680-0990
Paul Hightower	Bastrop WCID #2	General Manager	PAUL@BCWCID2.ORG	512-321-1688
Ronald Whipple	Bastrop WCID #2	Secretary	ron.whipple@sbcglobal.net	817-729-7826
Jeff Hewitt	Bastrop WCID #3	Director	Jeff.hewitt@Bastropwcid3.org	512-779-5459
Rhonda Murphy	H2O Partners Inc.	Senior Mitigation Specialist	rmurphy@h2opartnersusa.com	512-571-2088
Laura Haverlah	H2O Partners Inc.	Mitigation Specialist	lhaverlah@h2opartnersusa.com	512-831-2167
Stevie-Ann O'Donnell	H2O Partners Inc.	Mitigation Outreach Specialist	shodgson@h2opartnersusa.com	6311-921-2460

PUBLIC MEETING DOCUMENTATION

As discussed in Section 2, public meetings were held in Bastrop County. Documentation in the form of sign-in sheets for each of the meetings follows.

Figure E-4. Bastrop County Kickoff Public Meeting, June 3rd, 2021

BASTROP COUNTY HAZARD MITIGATION PLAN
Kickoff Public Meeting
Adobe Connect Webinar
June 3rd, 2021

Name	Jurisdiction	Title	Email	Phone
Cameron Drummond	Bastrop County	Reporter	cdrummond@statesman.com	214-280-2062
James Altgelt	Bastrop County	Asst. EMC	james.altgelt@co.bastrop.tx.us	512-718-3624
Christine Files	Bastrop County	EMC	christine.files@co.bastrop.tx.us	512-332-6837
Carolyn Dill	Bastrop County	County Engineer	carolyn.dill@co.bastrop.tx.us	512-553-7654
Abram Barker	Bastrop County	Floodplain Administrator	abram.barker@co.bastrop.tx.us	512-581-7159
Laci Anders	Bastrop County	Key Account Manager	Laciroseanders@gmail.com	737-615-7747
Justin Benzer	Bastrop County	Public	Jabezner@yahoo.com	512-825-2707
W. Richard Gartman	Bastrop County	Public	wrgartman@gmail.com	512-560-2771
Ronald Sowell	Bastrop County	Information Security Officer	Rsowell67@gmail.com	512-470-8313
Shondee Culpepper	Bastrop County	Public	Culpeppershondee@gmail.com	903-707-2073
Nick Textor	MUD#1	N/A	nick.textor@austin.rr.com	773-680-0990

BASTROP COUNTY HAZARD MITIGATION PLAN
Kickoff Public Meeting
Adobe Connect Webinar
June 3rd, 2021

Name	Jurisdiction	Title	Email	Phone
Amy Beal-Carroll	Bastrop County Pct.1	Board Member Could loony MUD 1F	Amybealcarroll74@gmail.com	410-533-2624
Joanna Morgan	Smithville	Mayor	jmorgan@ci.smithville.tx.us	512 484-0337
Loren Stagner	Smithville	Public	loren.stagner@shell.com	830-613-6056
Lavon Mayes	Elgin	CERT Instructor	Mayes.lavon@gmail.com	512-461-5238
Jake Carter	EISD	Public	jake@jakejive.com	512-785-1872
Chris Canning	TCEQ Austin Region 11	ERC	chris.canning@tceq.texas.gov	512-239-1464
Freddy Krail	Ascension Seton Smithville and Ascension Seton Bastrop	Safety Officer II	freddy.krail@medxcel.com	512-705-1845
Joe Arakkal	Poway, CA	SVP	gov@ccsglobaltech.com	858-208-4131
Jessica Fleming	State	Outreach Specialist	jessica.fleming@twdb.texas.gov	512-475-1764
Cynthia Landaverde	N/A	Public	So1977land@gmail.com	512-657-0404

BASTROP COUNTY HAZARD MITIGATION PLAN
Kickoff Public Meeting
Adobe Connect Webinar
June 3rd, 2021

Name	Jurisdiction	Title	Email	Phone
Heidi Watson	H2O Partners Inc	Mitigation Specialist	heidi@h2opartnersusa.com	512-568-2259
Stevie-Ann Hodgson-O'Donnell	H2O Partners Inc	Project Specialist	shodgson@h2opartnersusa.com	631-708-4491

Figure E-5. Bastrop County Risk Assessment Public Meeting, September 23rd, 2021

BASTROP COUNTY HAZARD MITIGATION PLAN
Risk Assessment Public Meeting
Adobe Connect Webinar
September 23rd, 2021

Name	Jurisdiction	Title	Email	Phone
Christine Files	Bastrop	EMC	christine.files@co.bastrop.tx.us	512-332-6837
Robert Tamble	Smithville	City Manager	citymanager@ci.smithville.tx.us	512-423-9390
Tanya Allen	Bastrop	Resident	tanyaallengough@gmail.com	801-928-9508
JoAnne Egitto	Bastrop	Resident	jegit82@yahoo.com	512-948-5759
Jacquelyn May	Bastrop	Resident	Jackiemay.may@gmail.com	512-663-0430
Samantha Hayes	Bastrop	Resident	samanthaphaynes@icloud.com	210-971-1660
Debbie Pittman	Bastrop	Resident	debbie.pittman@gmail.com	330-475-0509
James Williams	Bastrop	Resident	greyfox@greyfoxrepublic.net	202-683-8089
Lavon Mayes	Bastrop	Resident	Mayes.lavon@gmail.com	512-461-5238
Kathleen Kirby	Bastrop	Resident	kmkirby1@aol.com	601-415-6899

BASTROP COUNTY HAZARD MITIGATION PLAN
Risk Assessment Public Meeting
Adobe Connect Webinar
September 23rd, 2021

Name	Jurisdiction	Title	Email	Phone
Ron Whipple	Bastrop	WCID#2	ron.whipple@sbcglobal.net	817-729-7826
Hoyt Henry	Cedar Creek	Resident	Gath71@hotmail.com	512-914-1830
Trey Job	City of Bastrop	Assistant City Manger	tjob@cityofbastrop.org	512-332-8932
Jake Carter	Elgin	Resident	jake@jakejive.com	512-785-1872
David Edwards	Smithville ISD	Director of State and Federal Programs	dedwards@smithvilleisd.org	512-237-2487
Chris Canning	TCEQ Region 11	ERC	chris.canning@tceq.texas.gov	512-239-1464
Michael Shoe	Williamson County	EMC	michael.shoe@wilco.org	512-864-8267
Heidi Watson	H20 Partners Inc	Mitigation Specialist	heidi@h2opartnersusa.com	512-568-2259
Stevie-Ann Hodgson-O'Donnell	H20 Partners Inc	Project Specialist	shodgson@h2opartnersusa.com	631-708-4491

Figure E-6. Bastrop County Mitigation Strategy Public Meeting, November 17th, 2021

BASTROP COUNTY HAZARD MITIGATION PLAN
Mitigation Strategy Public Meeting
Adobe Connect Webinar
November 17th, 2021

Name	Jurisdiction	Title	Email	Phone
Christine Files	Bastrop County	EMC	christine.files@co.bastrop.tx.us	512-332-6837
James Altgelt	Bastrop County	Assistant EMC	james.altgelt@co.bastrop.tx.us	512-718-3624
Ronald Whipple	Bastrop County WCID2	Secretary	ron.whipple@sbcglobal.net	817-729-7826
Jane Seiver	Bastrop County MUD	Board of Directors	janiesevier@gmail.com	512-718-4621
Jennifer Beck	Bastrop County	Resident	jennifer.beck@stantec.com	512-845-9152
JoAnne Egitto	Bastrop ETJ	Resident	jegit82@yahoo.com	512-948-5759
James (Ron) Hilliard	City of Elgin	Resident	Ronhill1281@live.com	512-281-1281
Martin Theophilus	Bastrop County	Multi Media Producer	martinppi@austin.rr.com	512-636-1131
Michael Ellis	Camp Swift- Bastrop County	EMT	ellis.michael227@gmail.com	956-454-9793
Christel Key	Bastrop	Resident	Crosekey@hotmail.com	512-970-5621
Bob Brunson	Bastrop County	CEO	Roguebrun@gmail.com	469-233-6767
Jake Carter	City of Elgin	Resident	me@jakemcarter.com	512-785-1872
James Williams	Bastrop County	Resident	greyfox@greyfoxrepublic.net	202-683-8089
Susan Taylor	Bastrop County	Resident	susan@bluerubymusic.com	979-253-8236

BASTROP COUNTY HAZARD MITIGATION PLAN
Mitigation Strategy Public Meeting
Adobe Connect Webinar
November 17th, 2021

Name	Jurisdiction	Title	Email	Phone
Lynn Demartini	McDade- Bastrop County	Resident	lynn@indigocenter.com	512-718-8693
Freddy Krail	Ascension Seton-Smithville	Safety Officer II	freddy.krail@medxcel.com	512-705-1845
Blake Clampffer	Bastrop County ESD#1	Commissioner/VP	blake@bastropesd1.com	512-718-0964
Jami Haney	Bastrop County	Resident	Haney.jami@gmail.com	210-862-1779
Rachel Turman	Bastrop	Resident	rachel6246@gmail.com	512-304-5922
Brian Orange	City of Smithville	Resident	bdorange01@gmail.com	512-762-2482
Theresa McShan	City of Elgin	Resident	tmcshan44@austin.rr.com	512-636-9669
Theresa Secrest	Cedar Creek- Bastrop County	LCSW/Resident	tepsecrest@aol.com	512-963-4553
Anna Rau	City of Elgin	Resident	annaleighrau@gmail.com	512-751-7289
Lavon Mayes	Bastrop County	CERT Instructor	Mayes.lavon@gmail.com	512-461-5238
Anna Marie Blair	City of Elgin	Resident	gamrich@gmail.com	417-543-5432
Heidi Watson	H20 Partners Inc	Mitigation Specialist	heidi@h2opartnersusa.com	512-568-2259
Stevie-Ann Hodgson-O'Donnell	H20 Partners Inc	Project Specialist	shodgson@h2opartnersusa.com	631-708-4491

PUBLIC NOTICES

Public notices to announce Bastrop County's participation in the Plan Update development process were posted on their website, on social media sources including Facebook and Twitter, through the local media, and/or posting the information on bulletin boards in public facilities.

Figure E-7. Bastrop County Public Notice, Bulletin

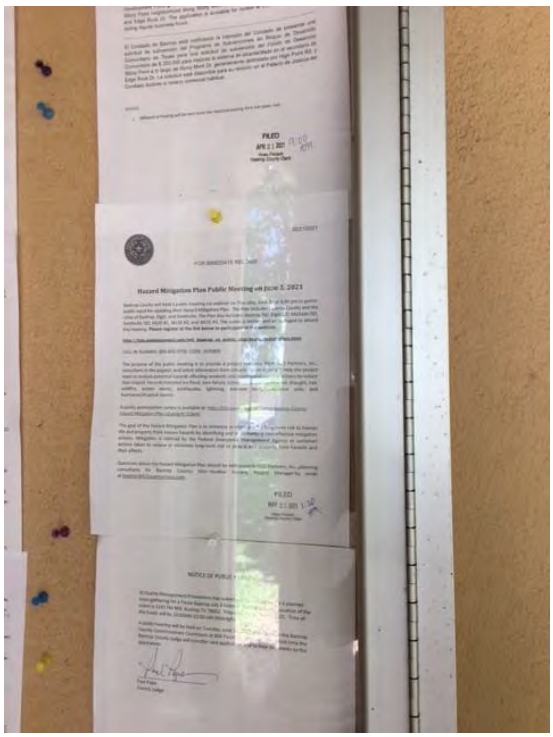


Figure E-8. Bastrop County Public Notice, Website



Figure E-9. Bastrop County Public Notice, Floodplain Management Website



Figure E-10. Bastrop County Public Notice, Development Services Website

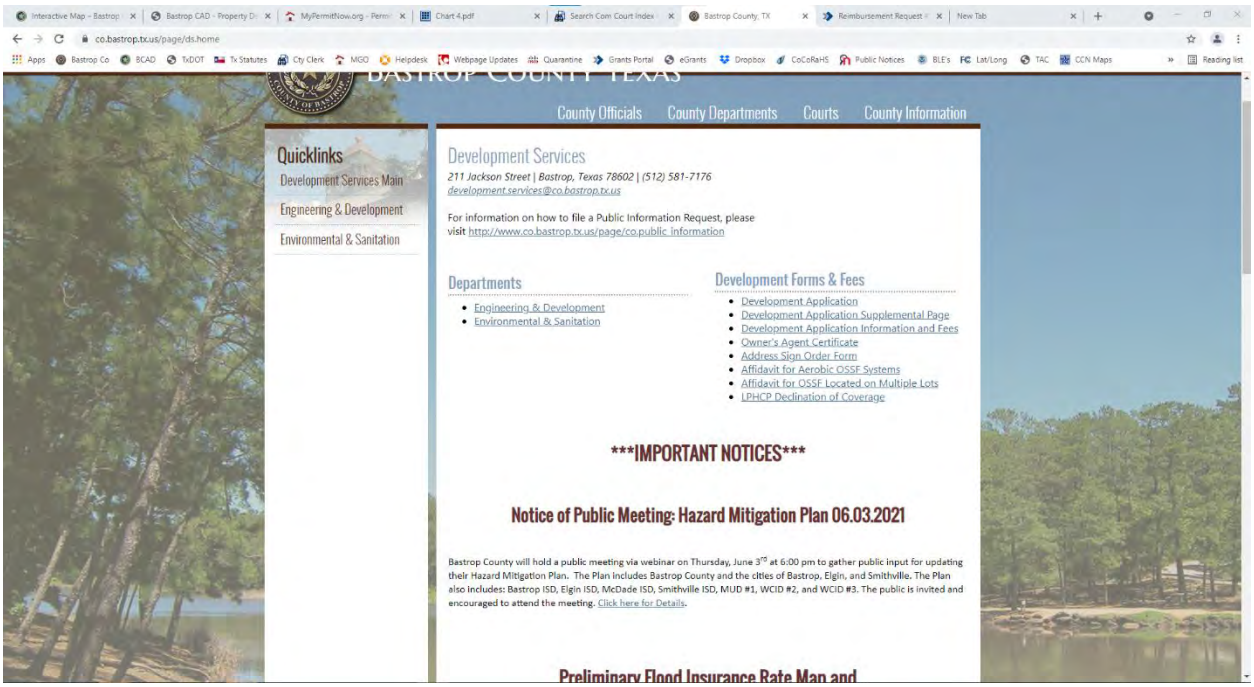


Figure E-11. Bastrop County Public Notice, Facebook

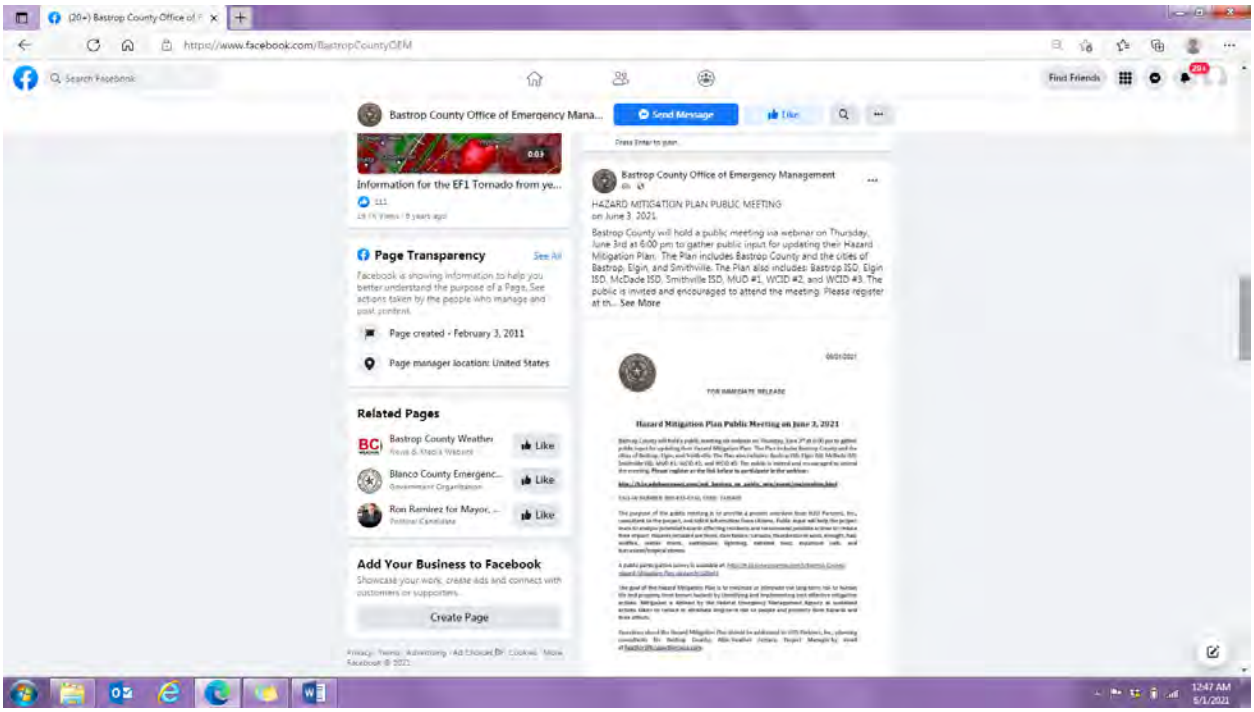


Figure E-12. Bastrop County Public Notice, Instagram

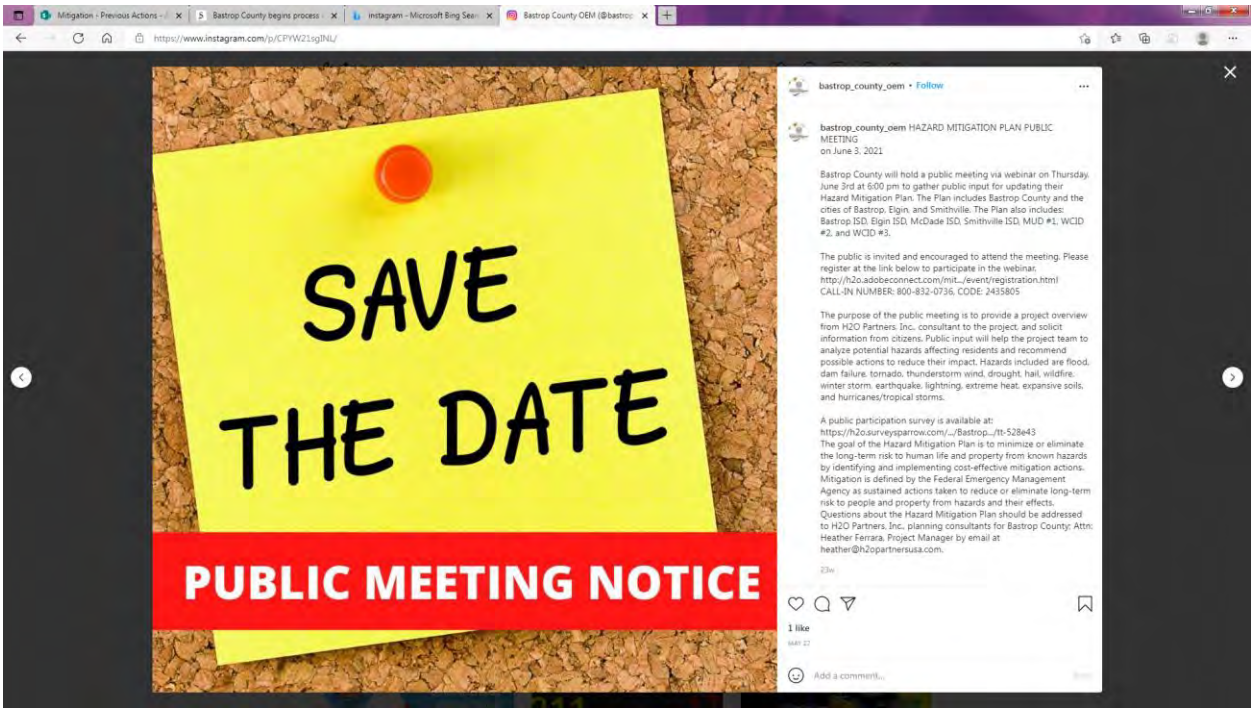


Figure E-13. Bastrop County Public Notice, NextDoor

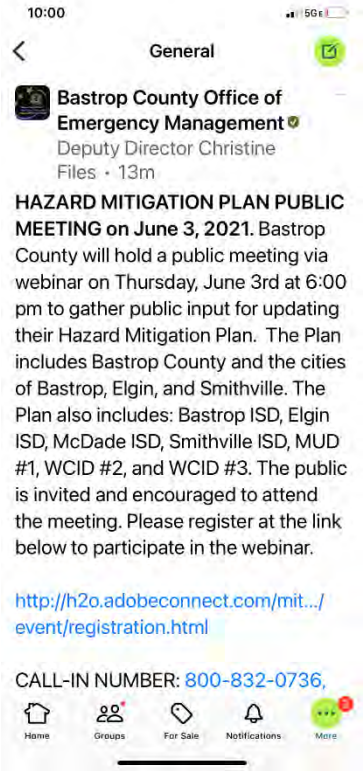


Figure E-14. Bastrop County Public Notice, Twitter

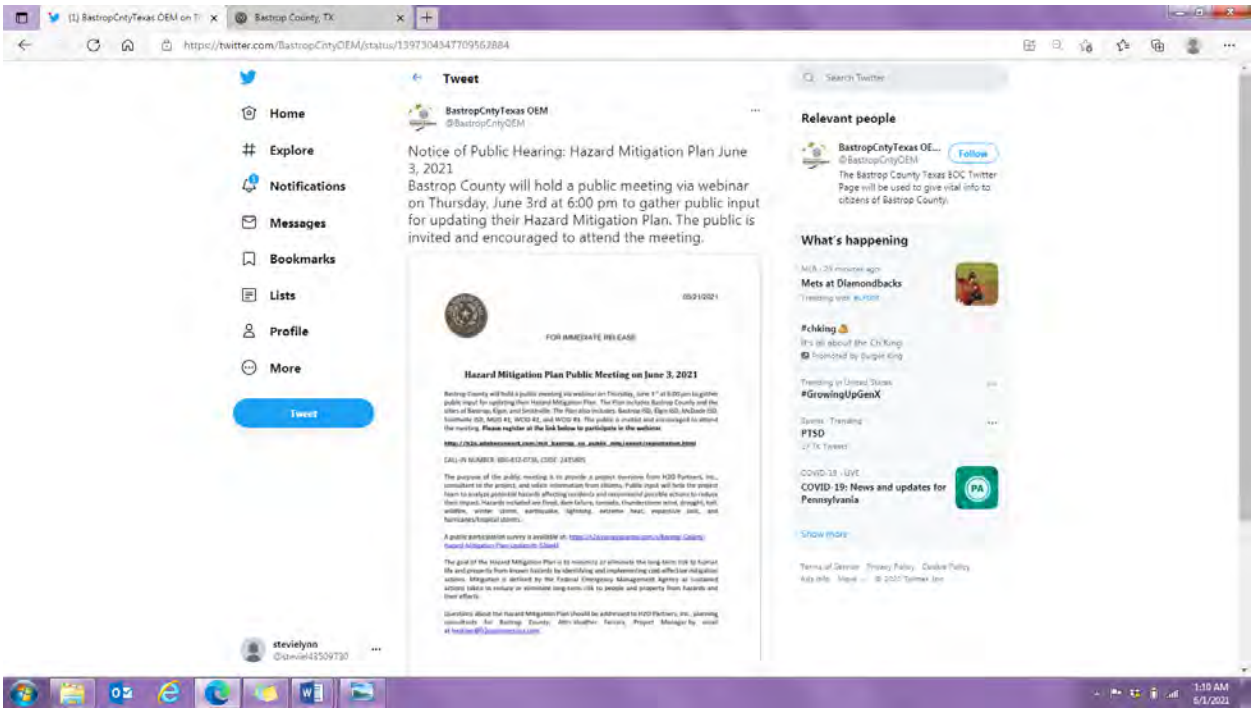


Figure E-15. City of Bastrop Public Notice, Facebook

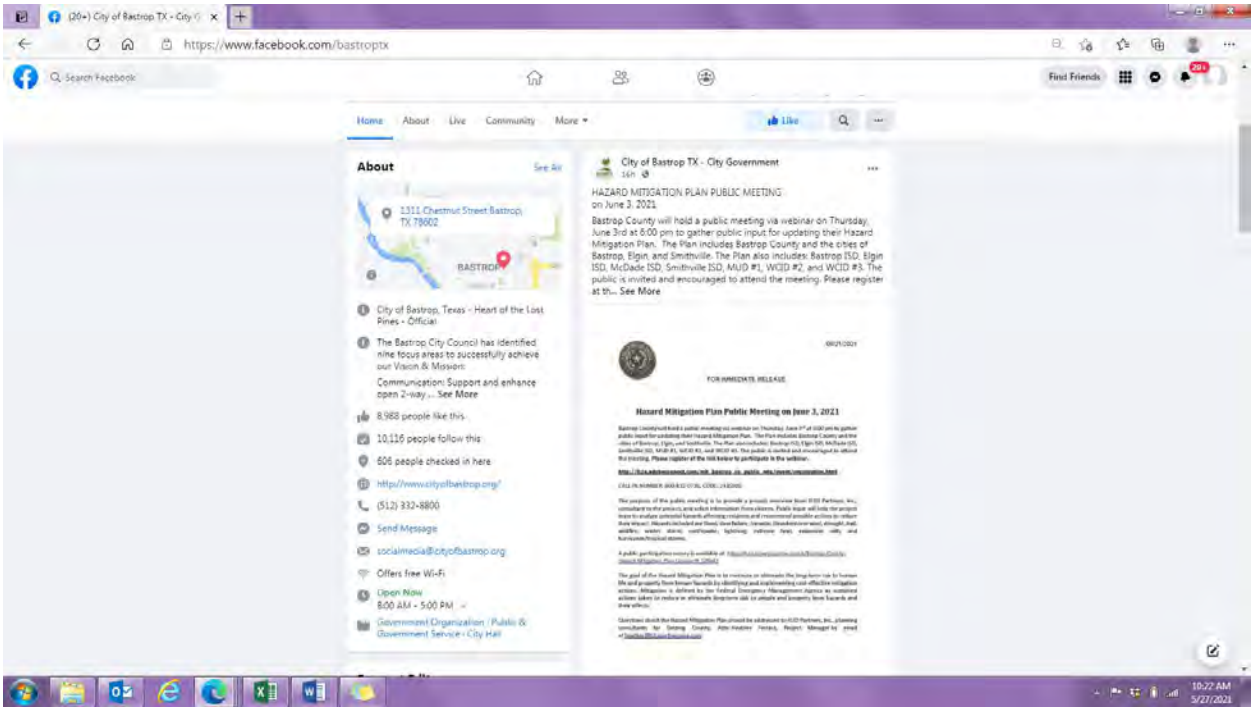


Figure E-16. City of Elgin Public Notice, Facebook

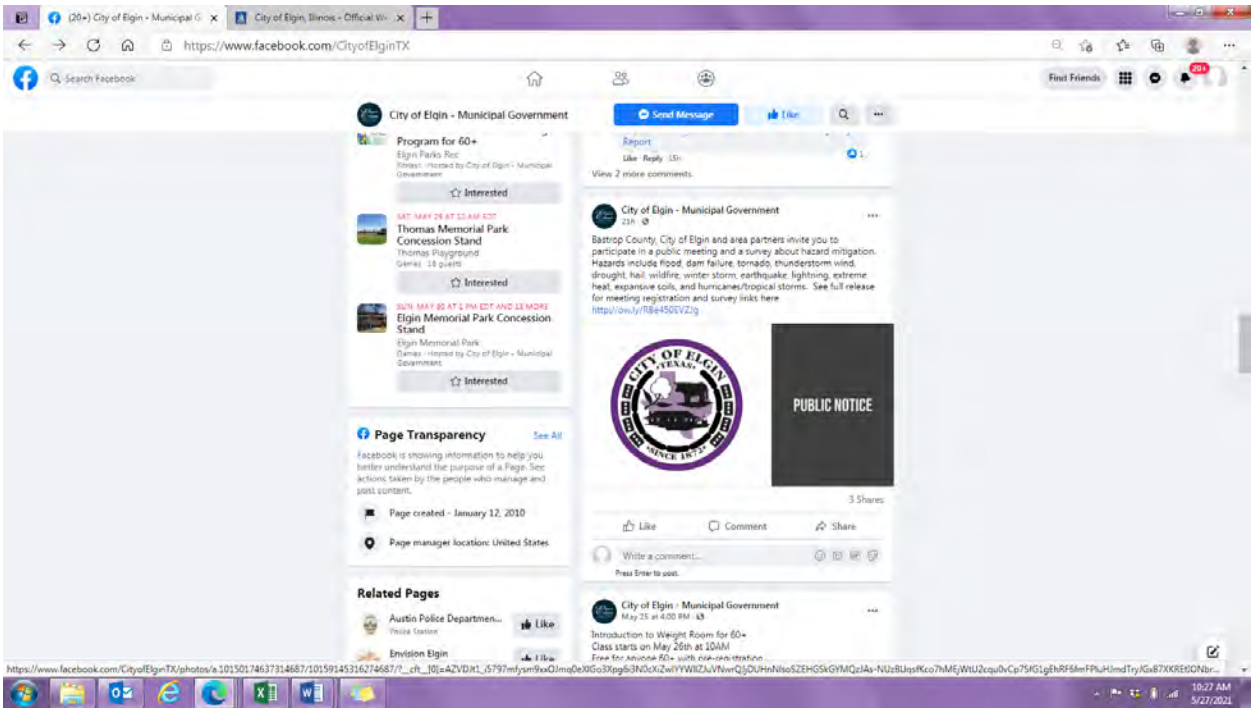


Figure E-17. City of Smithville Public Notice, Bulletin

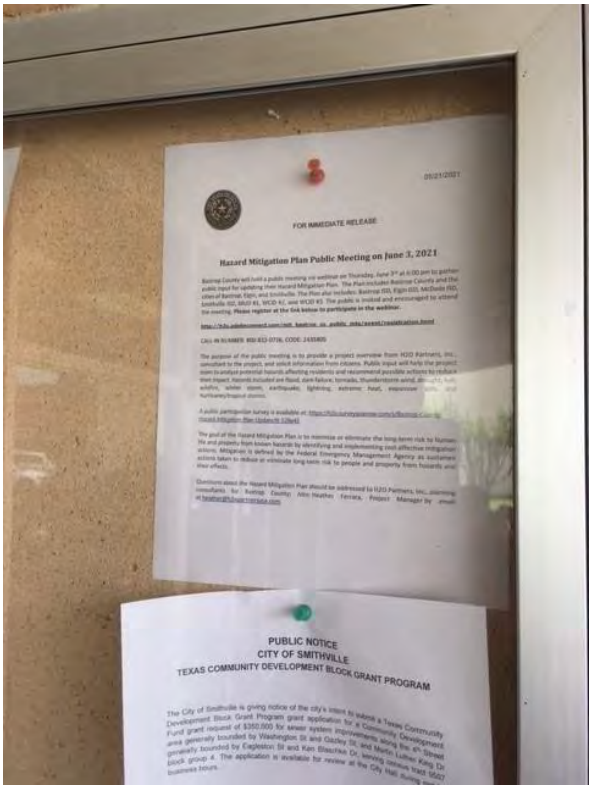


Figure E-18. City of Smithville Public Notice, Website

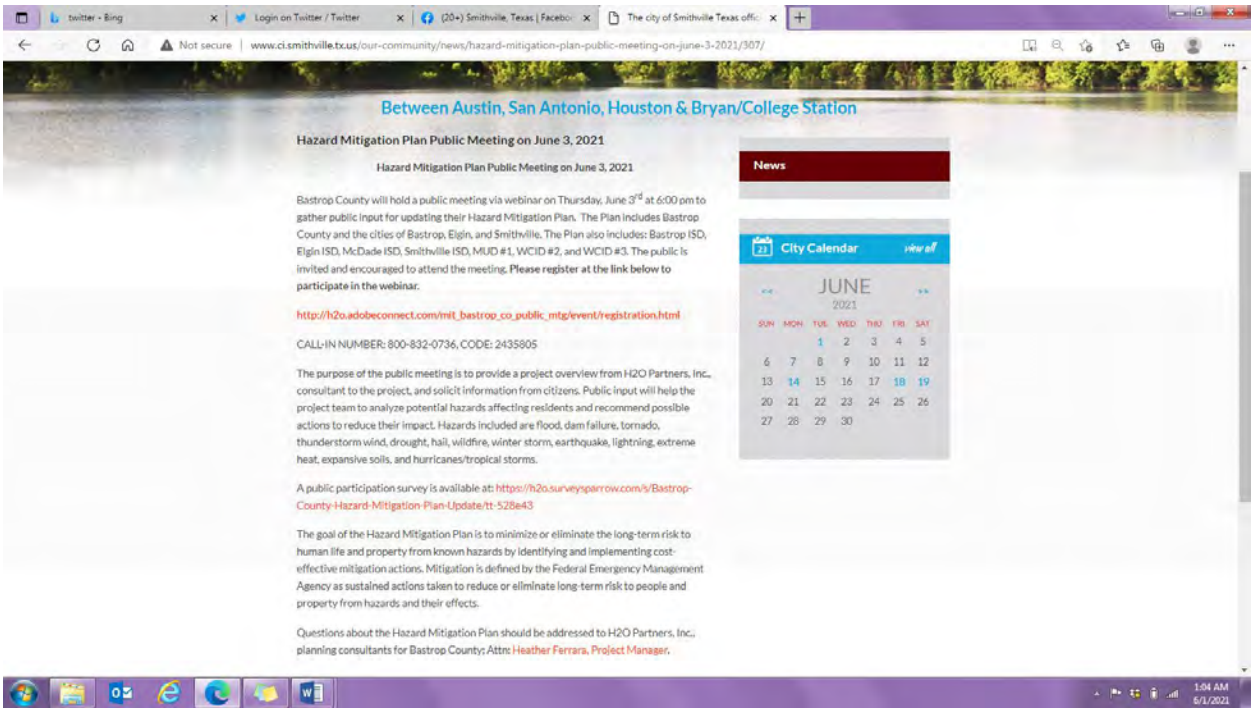


Figure E-19. City of Smithville Public Notice, Facebook

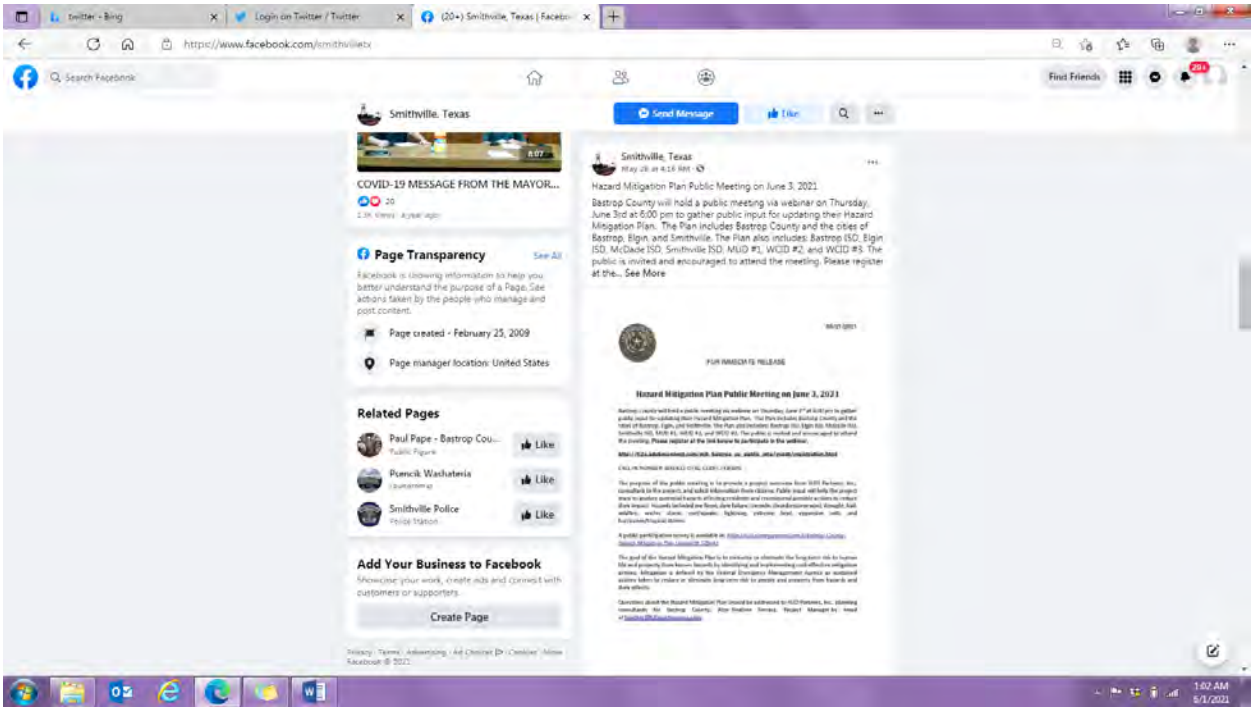


Figure E-20. City of Smithville Public Notice, NextDoor

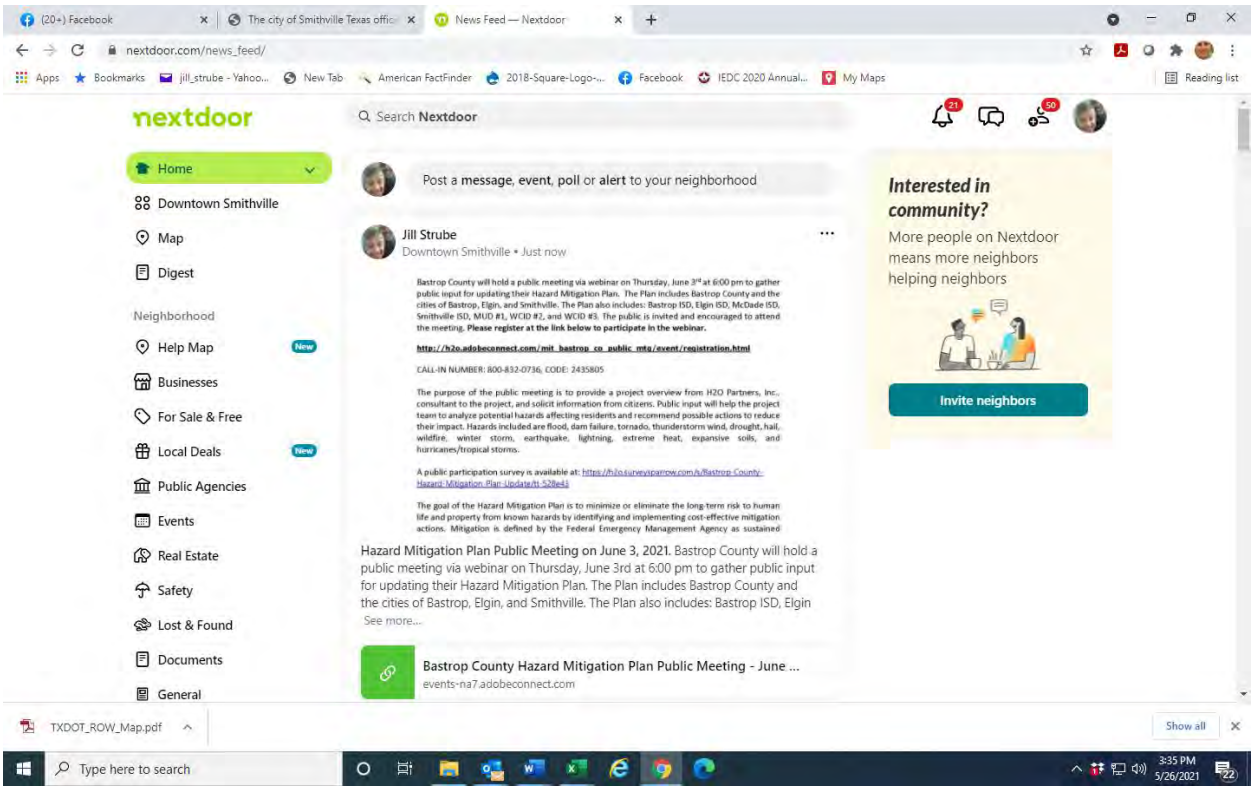


Figure E-21. Bastrop County Public Notice, Statesman Newspaper



Figure E-22. Bastrop County Public Notice, Website

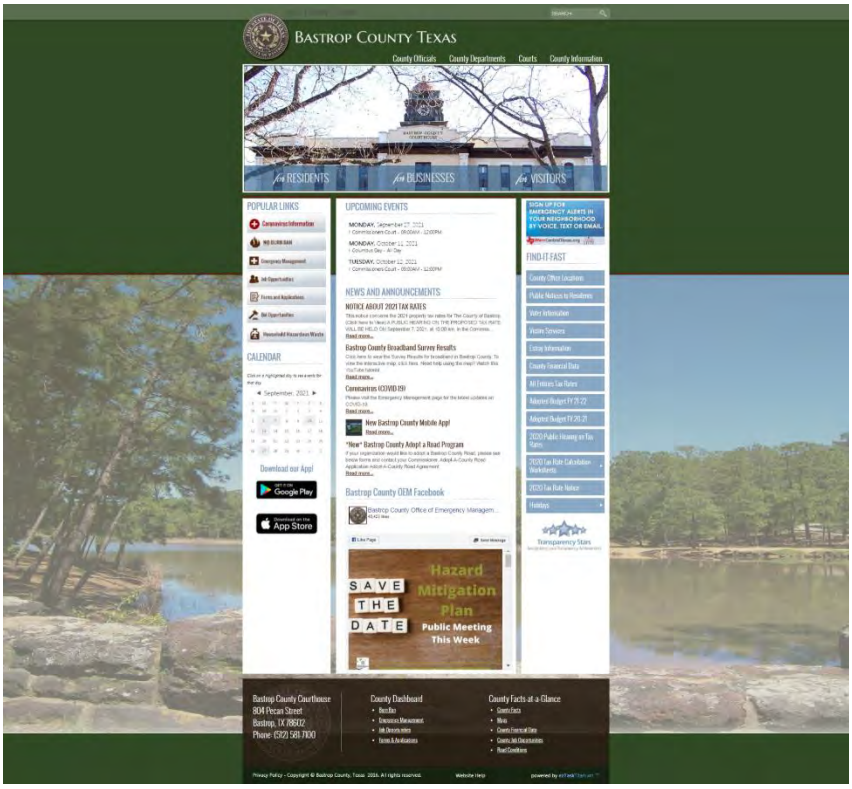


Figure E-23. Bastrop County Public Notice, Facebook



Figure E-24. Bastrop County Public Notice, NextDoor



Figure E-25. Bastrop County Public Notice, Instagram

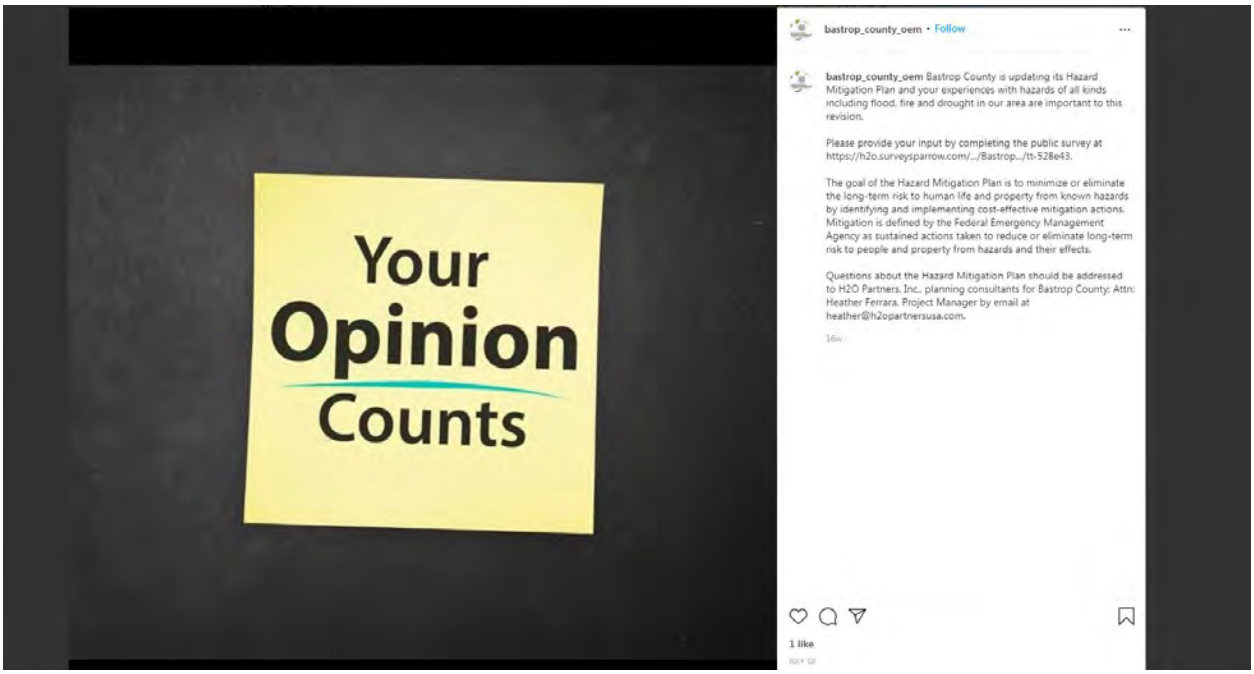


Figure E-26. City of Bastrop Public Notice, Website



Figure E-27. City of Elgin Public Notice, Facebook

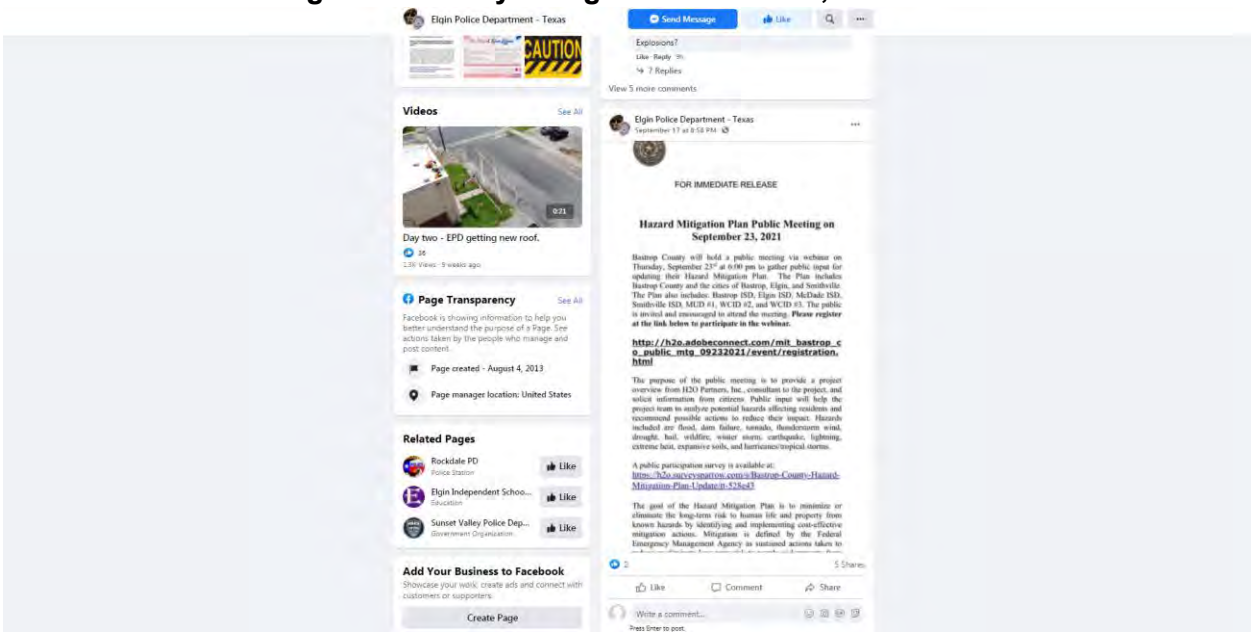


Figure E-28. City of Smithville Public Notice, City Website

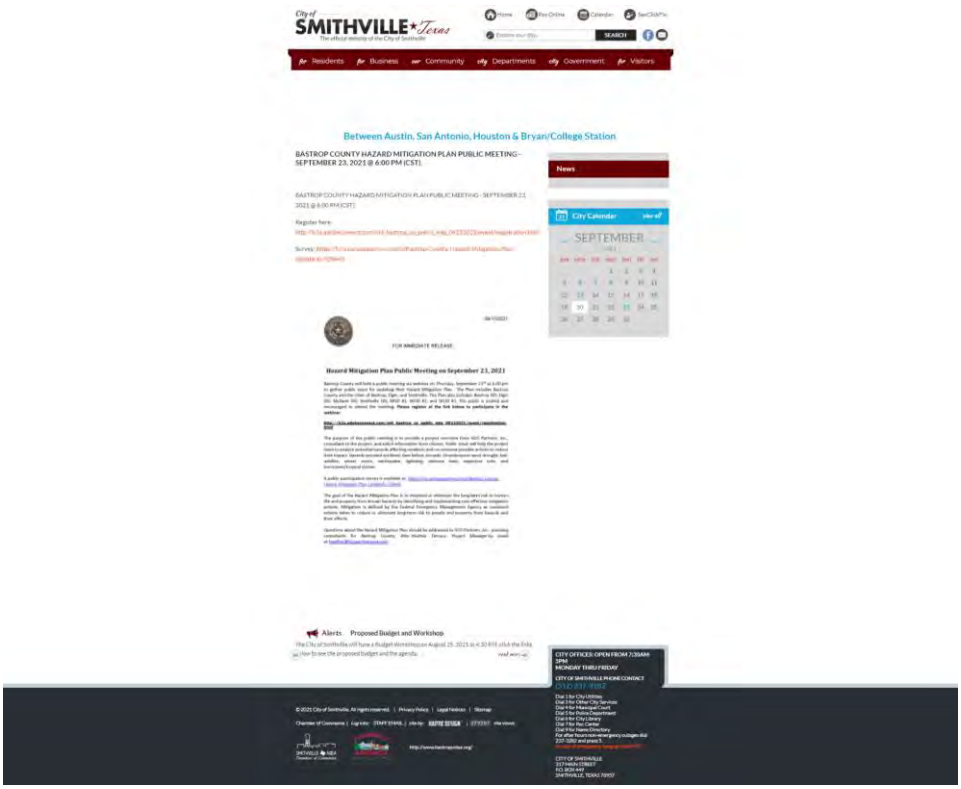


Figure E-29. City of Smithville Public Notice, Facebook

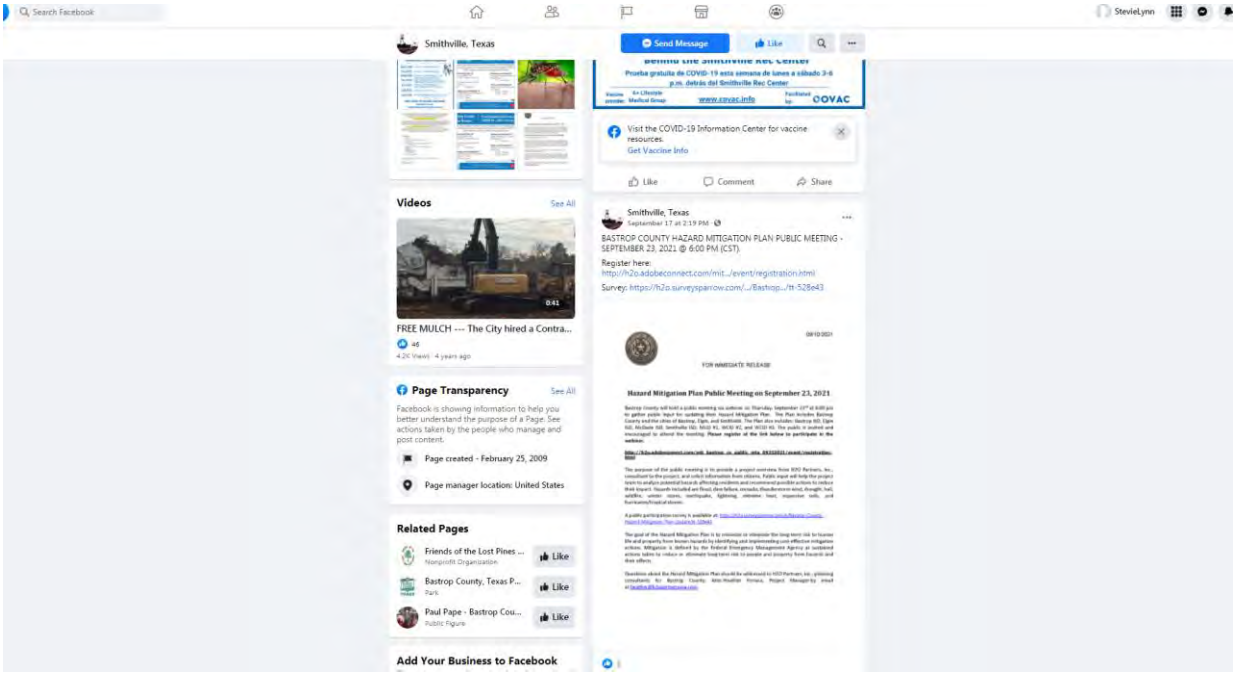


Figure E-30. Elgin ISD Public Notice, Website

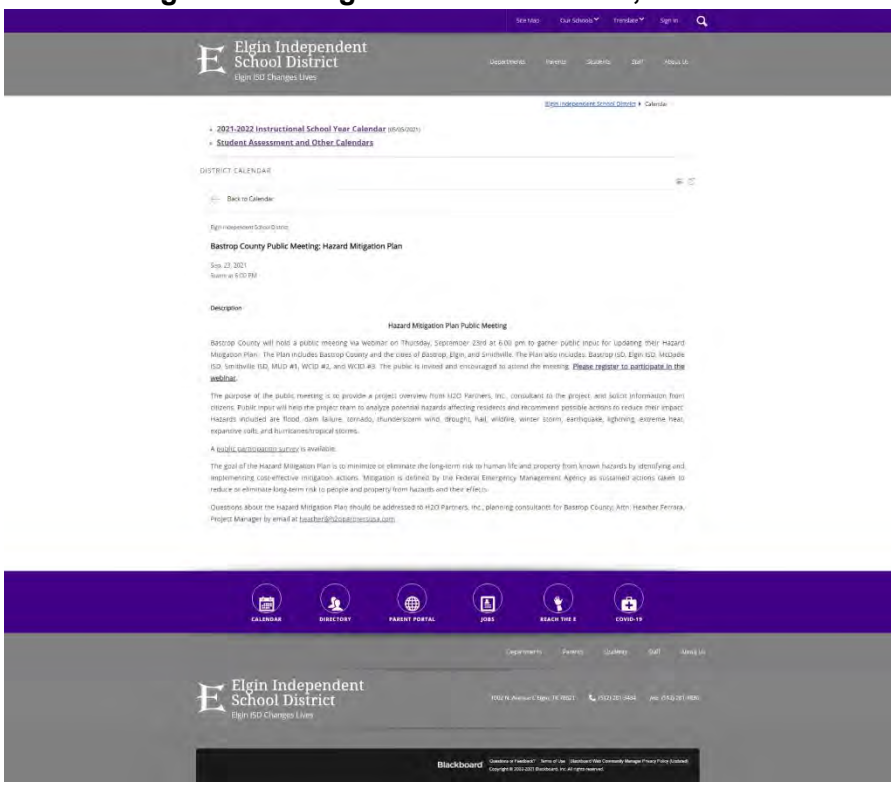


Figure E-31. Smithville ISD Public Notice, Website



Figure E-32. Bastrop County MUD #1 Public Notice, Website



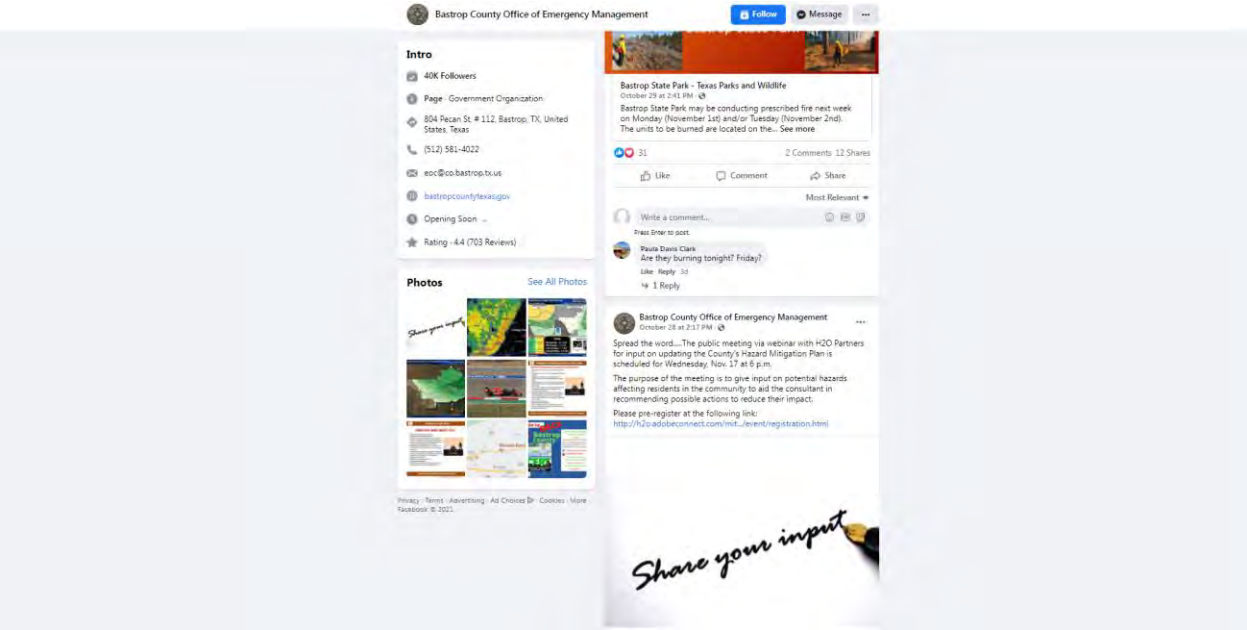
Figure E-33. Bastrop County Public Notice, Bulletin



Figure E-34. Bastrop County Public Notice, Website



Figure E-35. Bastrop County Public Notice, Facebook



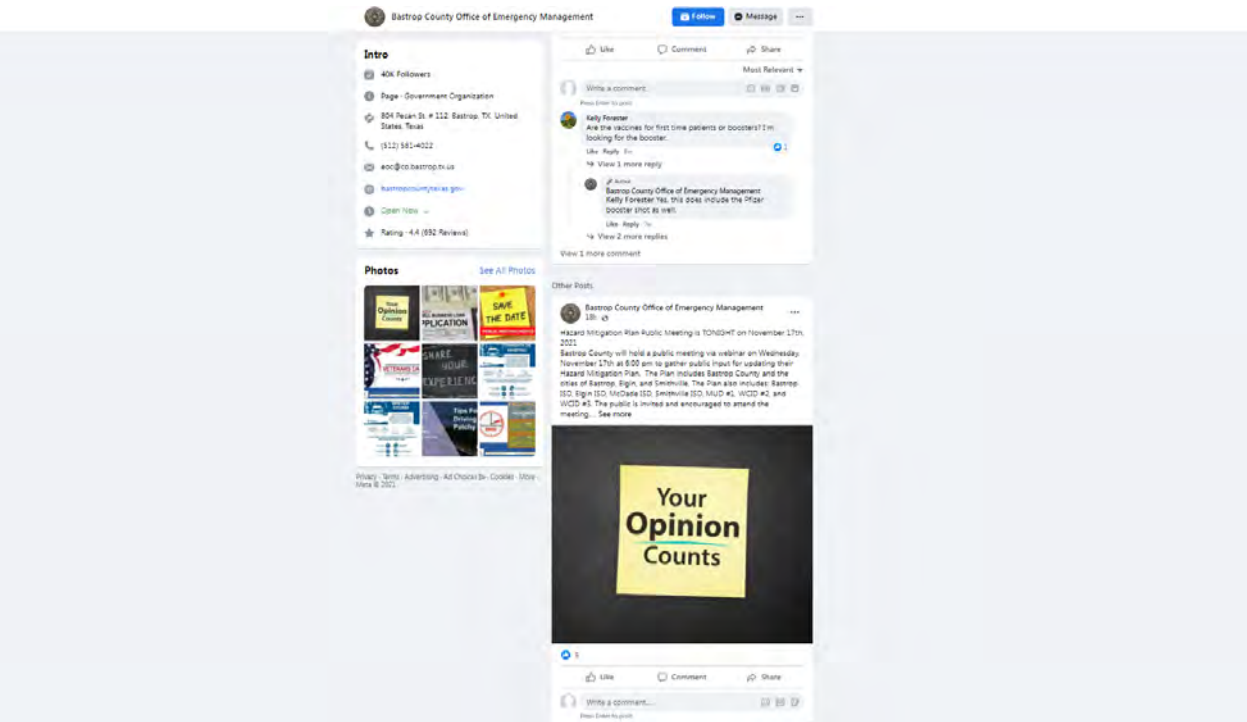
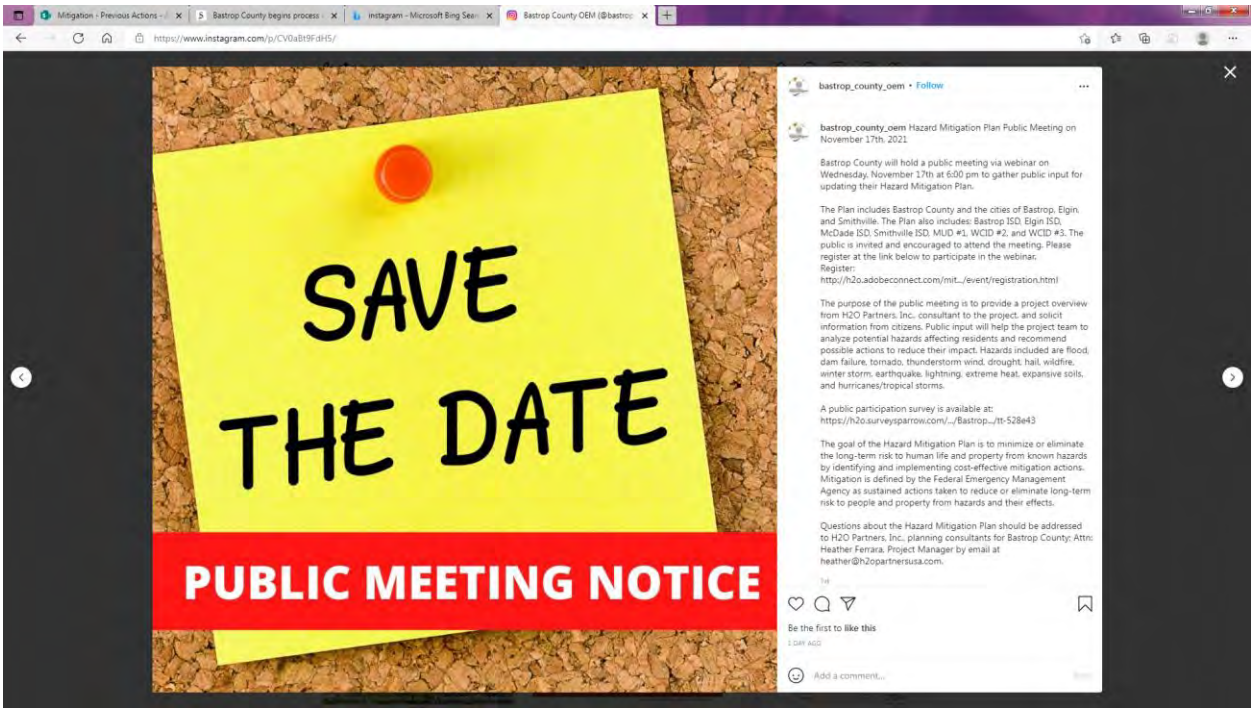


Figure E-36. Bastrop County Public Notice, Instagram





APPENDIX E: MEETING DOCUMENTATION

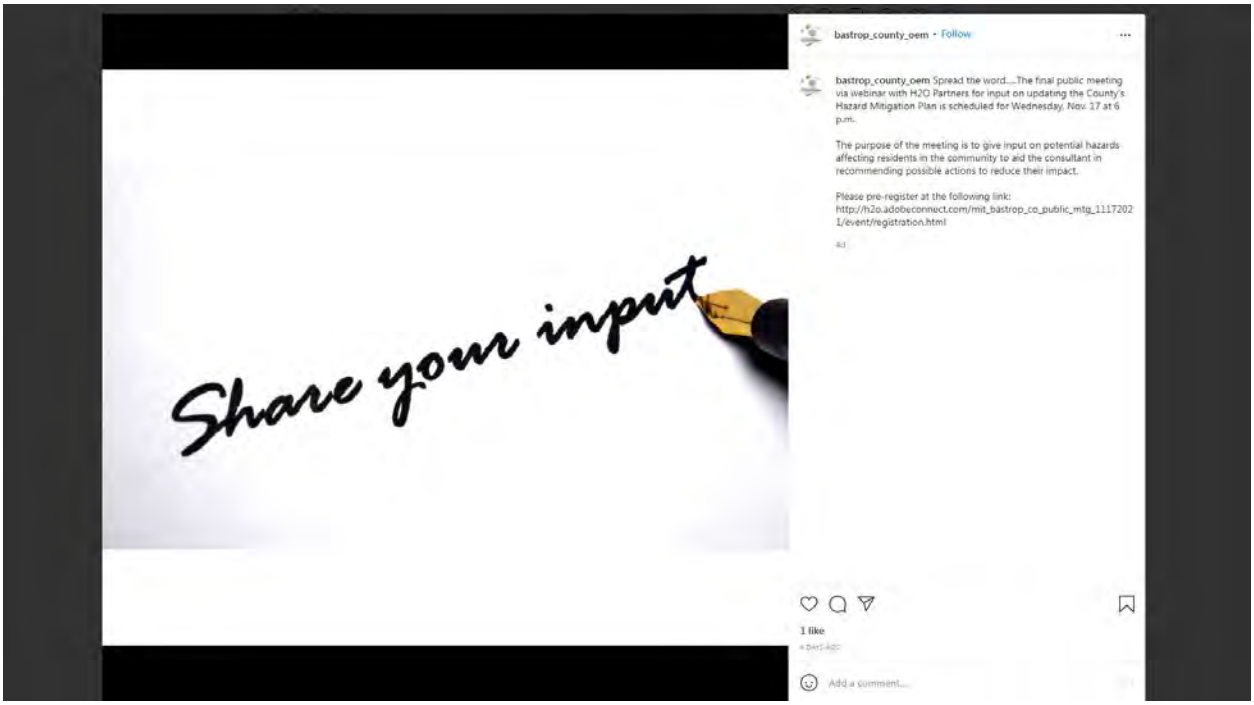


Figure E-37. Bastrop County Public Notice, Twitter

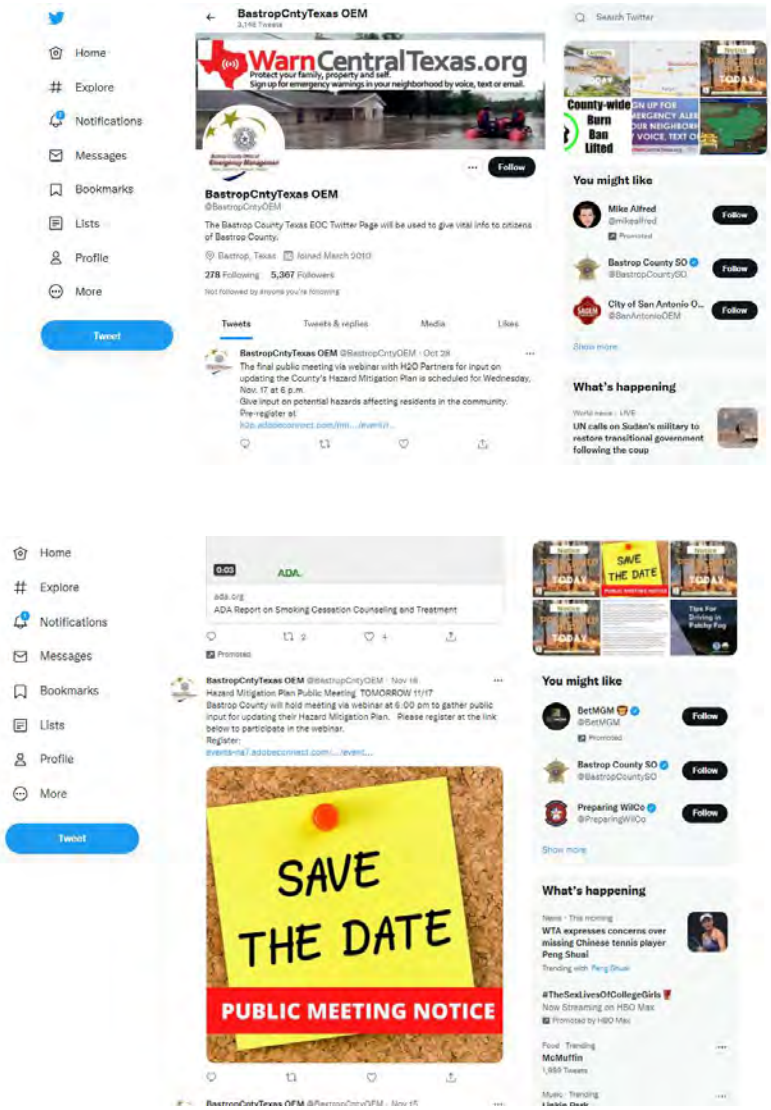
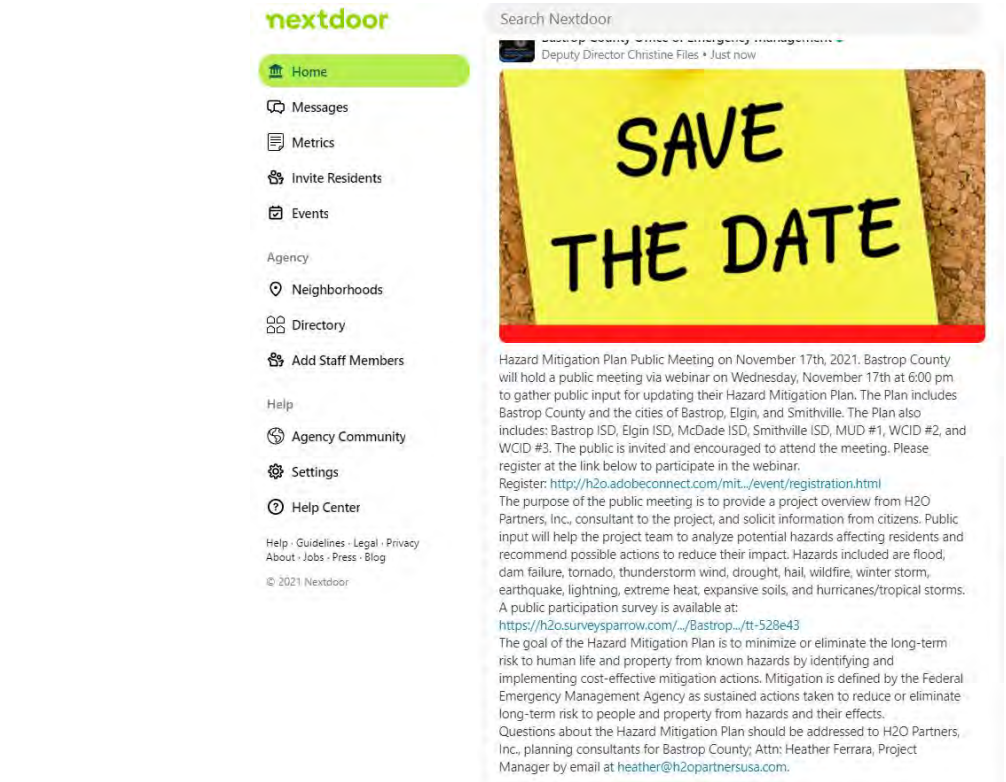


Figure E-38. Bastrop County Public Notice, NextDoor



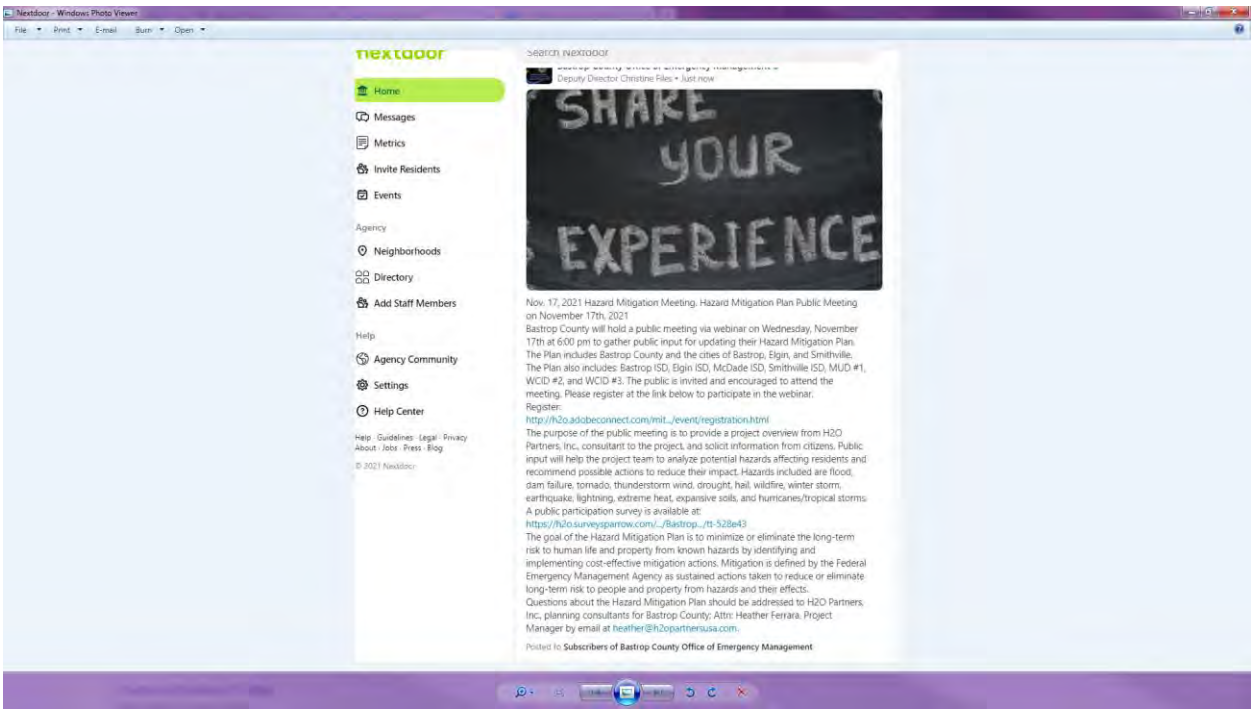


Figure E-39. City of Elgin Public Notice, City Website

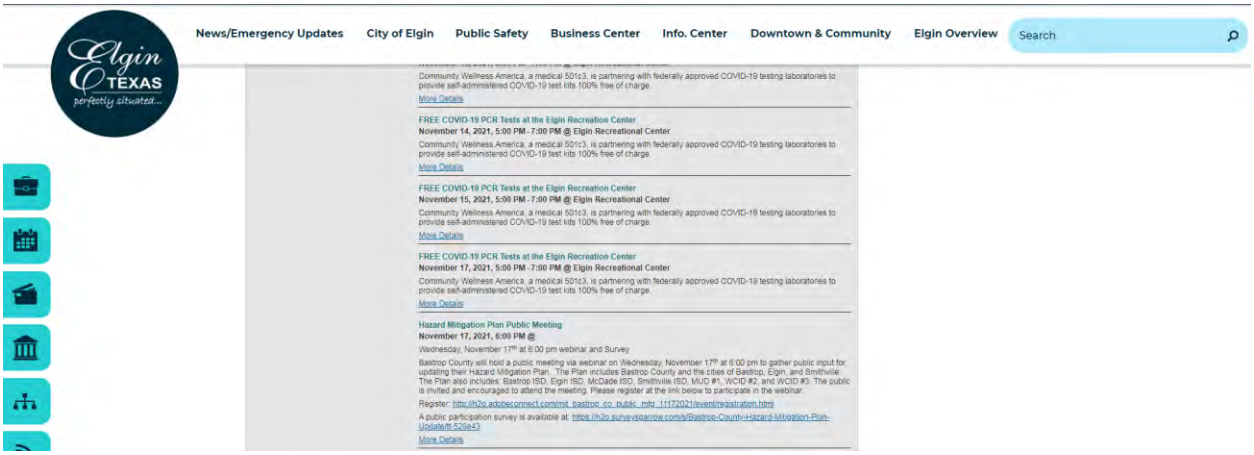


Figure E-40. City of Elgin Public Notice, Facebook

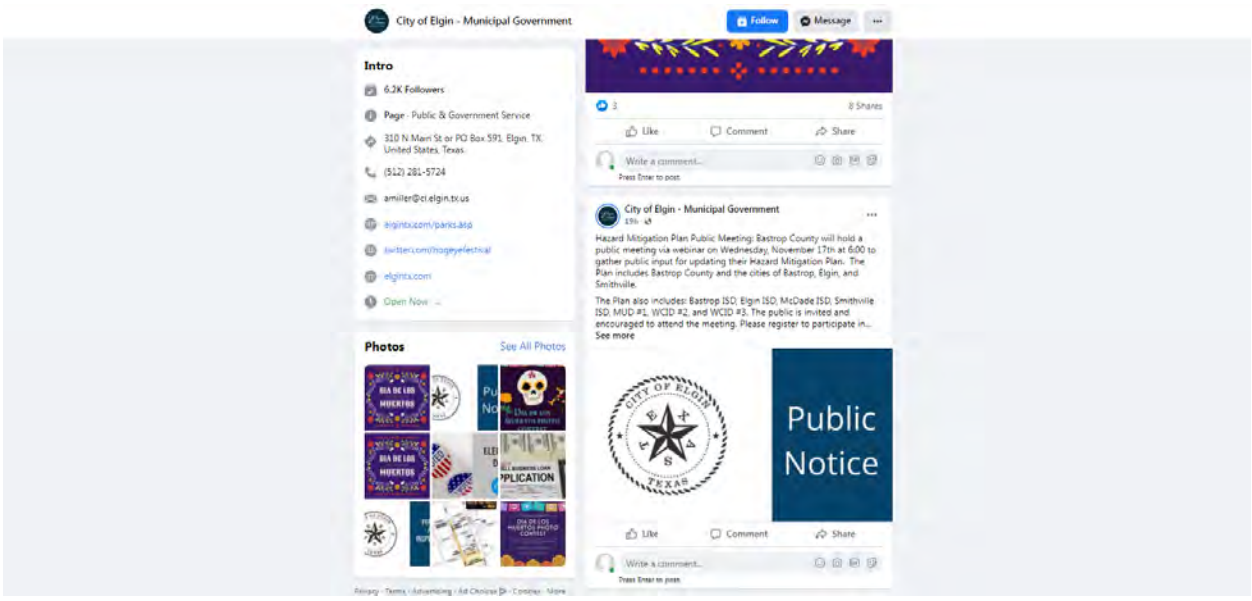


Figure E-41. City of Elgin Public Notice, Police Department Facebook

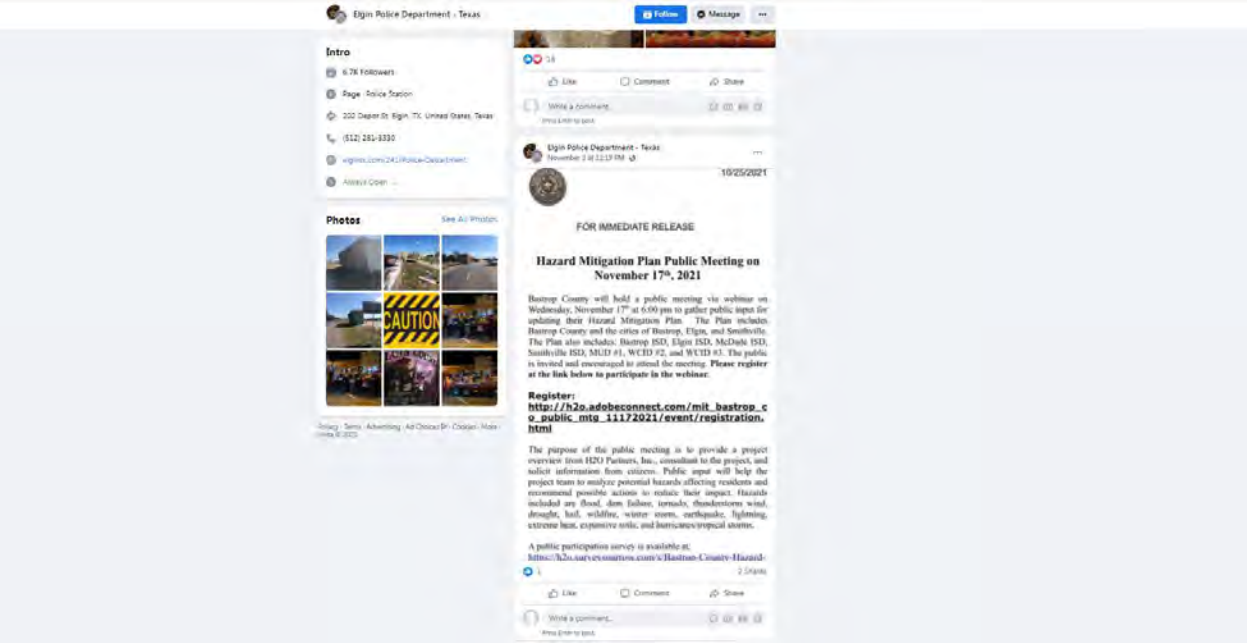


Figure E-42. City of Smithville Public Notice, City Website

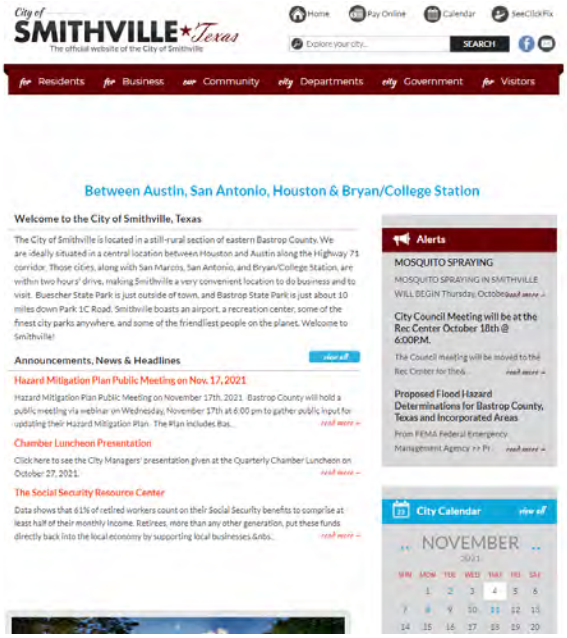


Figure E-43. City of Smithville Public Notice, Facebook

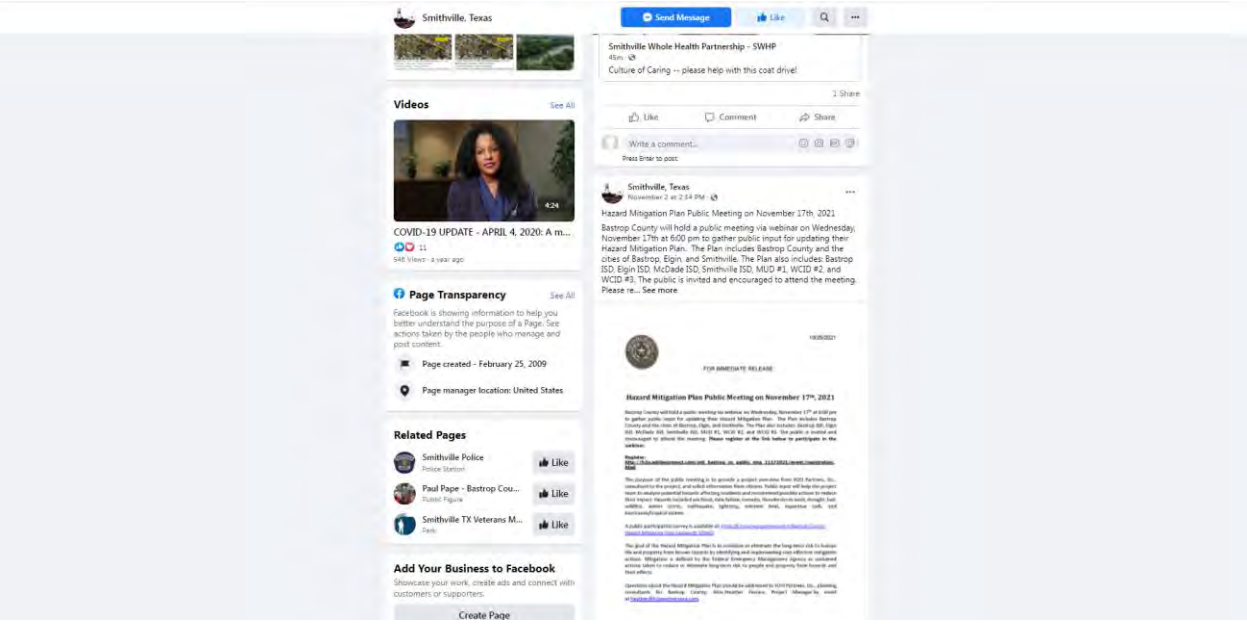


Figure E-44. Bastrop ISD Public Notice, Website

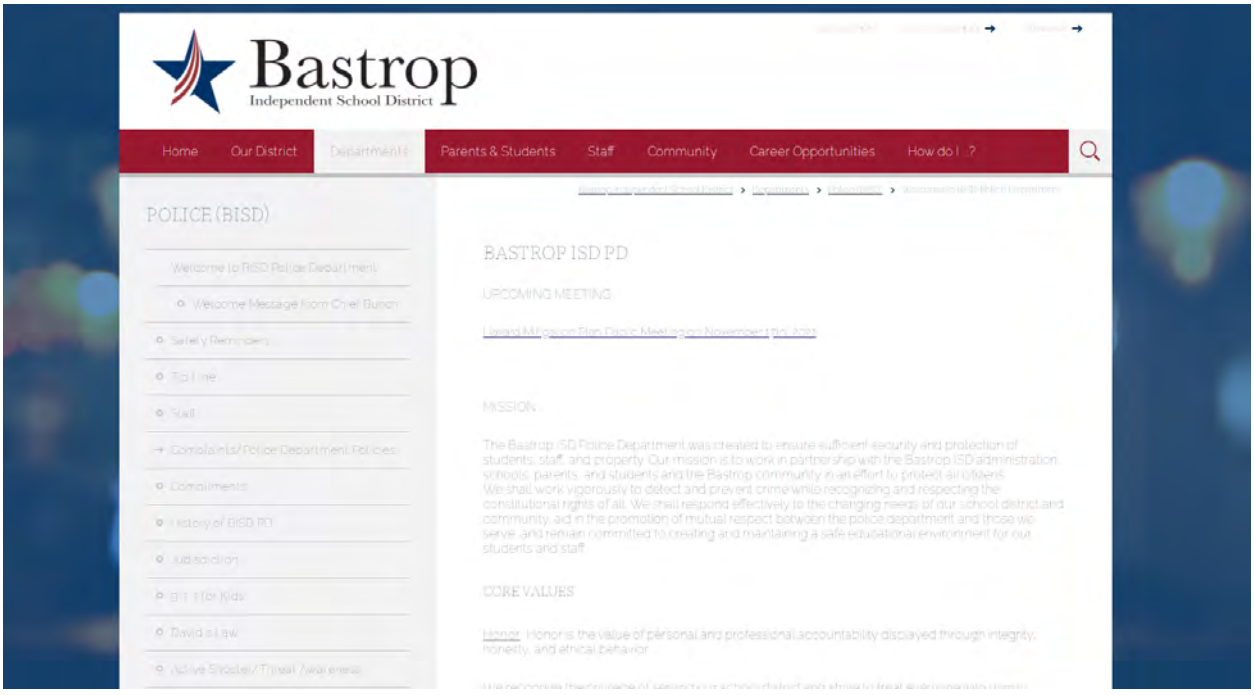
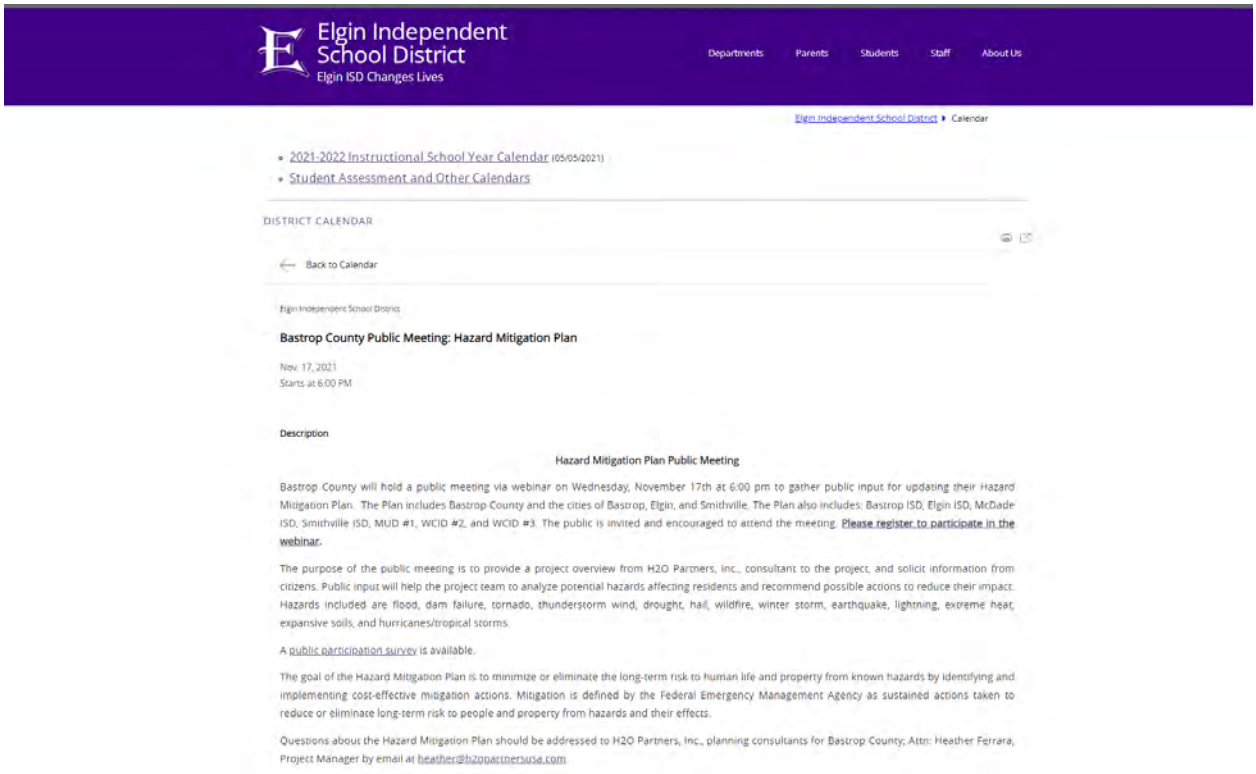


Figure E-45. Elgin ISD Public Notice, Website



Elgin Independent School District
Elgin ISD Changes Lives

Departments Parents Students Staff About Us

Elgin Independent School District ▸ Calendar

- 2021-2022 Instructional School Year Calendar (05/05/2021)
- Student Assessment and Other Calendars

DISTRICT CALENDAR

← Back to Calendar

Elgin Independent School District

Bastrop County Public Meeting: Hazard Mitigation Plan

Nov. 17, 2021
Starts at 6:00 PM

Description

Hazard Mitigation Plan Public Meeting

Bastrop County will hold a public meeting via webinar on Wednesday, November 17th at 6:00 pm to gather public input for updating their Hazard Mitigation Plan. The Plan includes Bastrop County and the cities of Bastrop, Elgin, and Smithville. The Plan also includes: Bastrop ISD, Elgin ISD, McDade ISD, Smithville ISD, MUD #1, WCID #2, and WCID #3. The public is invited and encouraged to attend the meeting. **Please register to participate in the webinar.**

The purpose of the public meeting is to provide a project overview from H2O Partners, Inc., consultant to the project, and solicit information from citizens. Public input will help the project team to analyze potential hazards affecting residents and recommend possible actions to reduce their impact. Hazards included are flood, dam failure, tornado, thunderstorm wind, drought, hail, wildfire, winter storm, earthquake, lightning, extreme heat, expansive soils, and hurricanes/tropical storms.

A public participation survey is available.

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

Questions about the Hazard Mitigation Plan should be addressed to H2O Partners, Inc., planning consultants for Bastrop County; Attn: Heather Ferrara, Project Manager by email at heather@h2opartnersusa.com

Figure E-46. Smithville ISD Public Notice, Bulletin



Figure E-47. Bastrop County MUD #1 Public Notice, Website

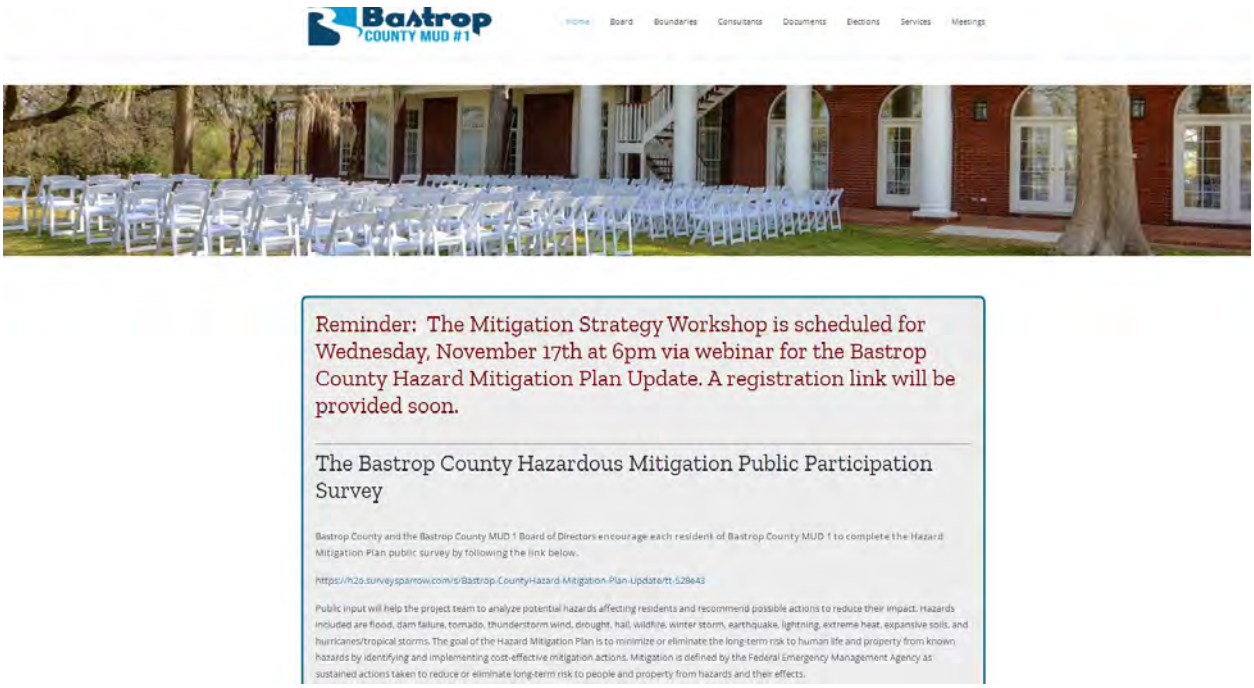
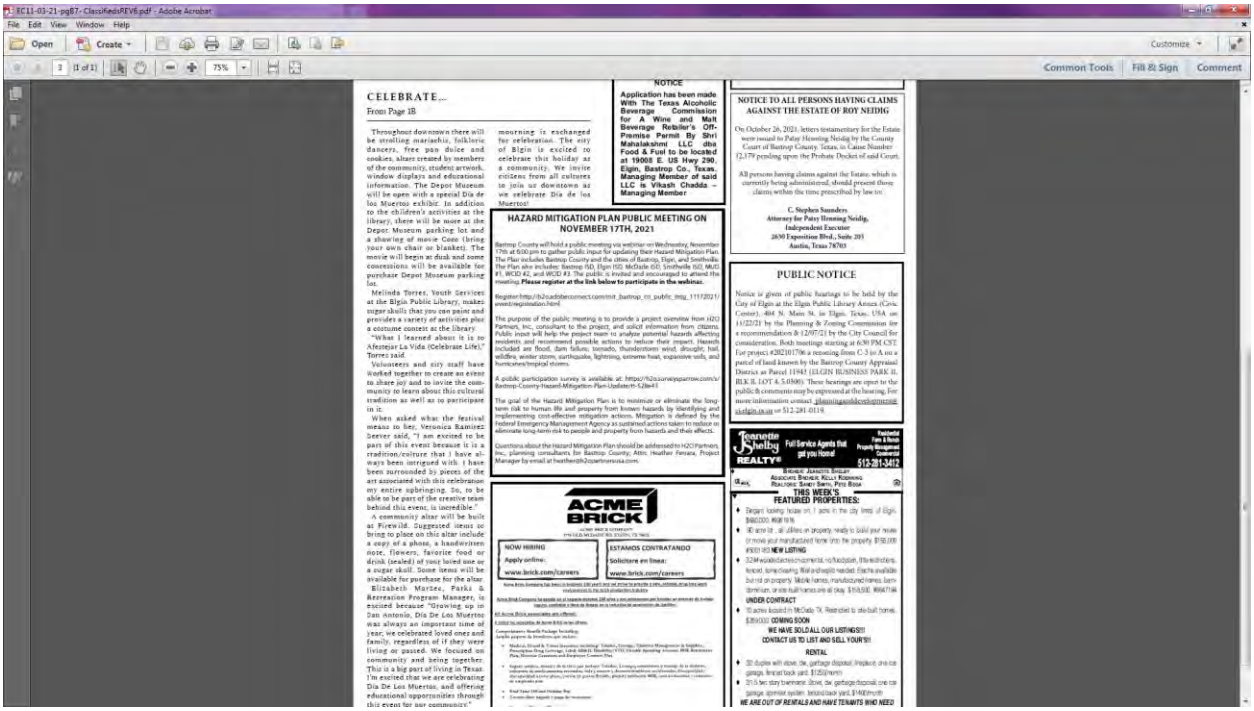


Figure E-48. Bastrop County Public Notice, Elgin Courier



APPENDIX F: CAPABILITY ASSESSMENT

Overview 1
Community Capability Assessments 2

OVERVIEW

A Community Capability Assessment is an integral component of the Hazard Mitigation Planning Process. It is an invaluable tool in assessing a community's existing planning and regulatory capabilities to support implementation of mitigation strategy objectives.

Beginning on Page 2, a completed Capability Assessment Checklist provides information on existing policies, plans, and regulations in place for Planning Team members at the local level or that may be provided by the County on an as-needed basis. ***Participation is denoted with an "x" on the Checklist.***

COMMUNITY CAPABILITY ASSESSMENTS

COMMUNITY CAPABILITY CHECKLIST	*Bastrop County*	*City of Bastrop*	*City of Elgin*	*City of Smithville*
Plans				
Capital Improvements Plan	X	X	X	X
Community Wildfire Protection Plan	X			
Comprehensive / Master Plan / Land Use Plan		X	X	X
Continuity of Operations	X	X		X
Emergency Operations Plan	X	X	X	X
Evacuation Plan	X	X		X
Hazard Mitigation Plan	X	X		X
Stormwater Management Plan	X	X		
Policies / Ordinances				
Building Codes	X	X	X	X
Fire Code		X	X	X
Floodplain Ordinance	X	X	X	X
Stormwater Ordinance	X	X	X	
Subdivision Regulations	X	X	X	X
Wildfire Ordinance	X	X		
Zoning Ordinance/Land Use Restrictions		X	X	X
Programs				
Floodplain Maps/Flood Insurance Studies	X	X	X	X
Hydrologic/Hydraulic Studies	X	X	X	X
Mutual Aid Agreement	X	X	X	X

APPENDIX F: CAPABILITY ASSESSMENT

COMMUNITY CAPABILITY CHECKLIST	*Bastrop County*	*City of Bastrop*	*City of Elgin*	*City of Smithville*
National Flood Insurance Program Participant	X	X	X	X
NFIP Community Rating System Participant	X			
Property Acquisition Program	X	X		X
Public Education/Awareness Programs	X	X		X
Storm Drainage Systems Maintenance Program	X	X		X
Stream Maintenance Program		X		X
Warning Systems/Services	X	X		X
Staff / Departments				
Building Code Official		X	X	X
Emergency Manager	X	X	X	X
Engineer	X	X		X
Environmental Conservation Specialist	X			
Floodplain Administrator	X	X	X	X
Geographic Information Systems (GIS) Coordinator	X	X		X
Personnel with Hazard Knowledge	X	X		X
Planner	X	X	X	X
Public Information Official	X	X	X	X
Resource Development/Grant Writer	X	X	X	X

APPENDIX F: CAPABILITY ASSESSMENT

COMMUNITY CAPABILITY CHECKLIST	*Bastrop ISD*	*Elgin ISD*	*McDade ISD*	*Smithville ISD*
Plans				
Capital Improvements Plan	X	X	X	
Community Wildfire Protection Plan			X	
Comprehensive / Master Plan / Land Use Plan	X		X	
Continuity of Operations	X	X	X	X
Emergency Operations Plan	X	X	X	X
Evacuation Plan	X	X	X	X
Hazard Mitigation Plan	X	X	X	X
Stormwater Management Plan			X	
Policies / Ordinances				
Building Codes	X			
Fire Code	X			
Floodplain Ordinance				
Stormwater Ordinance				
Subdivision Regulations			X	
Wildfire Ordinance			X	
Zoning Ordinance/Land Use Restrictions			X	
Programs				
Floodplain Maps/Flood Insurance Studies			X	
Hydrologic/Hydraulic Studies			X	
Mutual Aid Agreement	X	X		
National Flood Insurance Program Participant			X	
NFIP Community Rating System Participant			X	

APPENDIX F: CAPABILITY ASSESSMENT

COMMUNITY CAPABILITY CHECKLIST	*Bastrop ISD*	*Elgin ISD*	*McDade ISD*	*Smithville ISD*
Property Acquisition Program			X	
Public Education/Awareness Programs	X	X	X	
Storm Drainage Systems Maintenance Program			X	
Stream Maintenance Program			X	
Warning Systems/Services	X	X	X	
Staff / Departments				
Building Code Official				
Emergency Manager	X	X	X	
Engineer				
Environmental Conservation Specialist				
Floodplain Administrator				
Geographic Information Systems (GIS) Coordinator				
Personnel with Hazard Knowledge	X	X	X	
Planner				
Public Information Official	X	X	X	X
Resource Development/Grant Writer		X	X	X

APPENDIX F: CAPABILITY ASSESSMENT

COMMUNITY CAPABILITY CHECKLIST	*MUD #1*	*WCID #2*	*WCID #3*
Plans			
Capital Improvements Plan	X	X	X
Community Wildfire Protection Plan			
Comprehensive / Master Plan / Land Use Plan			
Continuity of Operations	X		
Emergency Operations Plan	X	X	
Evacuation Plan			
Hazard Mitigation Plan	X		
Stormwater Management Plan			
Drought Contingency & Emergency Water Plan	X		
Policies/Ordinances			
Building Codes			
Fire Code			
Floodplain Ordinance			
Stormwater Ordinance			
Subdivision Regulations			
Wildfire Ordinance			
Zoning Ordinance/Land Use Restrictions			
Programs			
Floodplain Maps/Flood Insurance Studies	X	X	
Hydrologic/Hydraulic Studies		X	
Mutual Aid Agreement			

APPENDIX F: CAPABILITY ASSESSMENT

COMMUNITY CAPABILITY CHECKLIST	*MUD #1*	*WCID #2*	*WCID #3*
National Flood Insurance Program Participant			
NFIP Community Rating System Participant			
Property Acquisition Program			
Public Education/Awareness Programs			
Storm Drainage Systems Maintenance Program			
Stream Maintenance Program			
Warning Systems/Services	X		
Staff/Departments			
Building Code Official	X		
Emergency Manager			
Engineer	X		
Environmental Conservation Specialist			
Floodplain Administrator			
Geographic Information Systems (GIS) Coordinator			
Personnel with Hazard Knowledge		X	
Planner			
Public Information Official			X
Resource Development/Grant Writer			