



Hays County Hazard Mitigation Plan Update 2018

JSW & Associates, Inc.
Hazard Mitigation Consultants

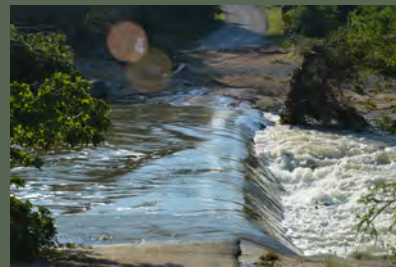
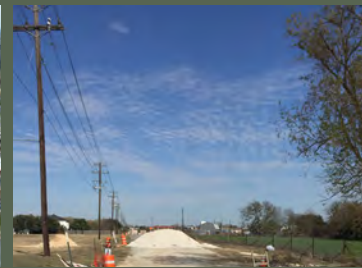


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Executive Summary

Hays County, Texas has developed and maintained its Hazard Mitigation Plan because of the increasing awareness that natural hazards, especially floods, have the potential to affect the County and its citizens.

Background of Mitigation Planning

Through hazard mitigation planning, it is possible to minimize the losses that disasters can cause. The responsibility for hazard mitigation lies with many, including private property owners; business and industry; and local, State, and Federal government.

The Disaster Mitigation Act of 2000 (DMA 2000) is Federal legislation that requires proactive, pre-disaster planning as a prerequisite for some funding available under the Robert T. Stafford Act. The DMA 2000 encourages State and local authorities to work together on pre-disaster planning. An approved Hazard Mitigation Plan (HMP) is a requirement in order for the County to remain eligible for some types of project grants that are administered by the Texas Division of Emergency Management (TDEM), the Texas Water Development Board (TWDB) and the Federal Emergency Management Agency (FEMA).

History of Hays County Mitigation Planning

In April 2003, Hays County initiated the development of its first HMP. The initial Hays County HMP was approved in 2006, and established the County's long-term strategy for reducing its risks from natural hazards. In 2011, the Hays County HMP update included reevaluation of the original hazards, risk assessment, mitigation goals, strategies, and mitigation priorities. As part of the update process, these sections of the Plan were reassessed to identify changes and updates that may have occurred since approval and adoption of the original plan.

The 2018 Hays County Hazard Mitigation Plan Update

In 2016, Hays County Mitigation Planning Committee (MPC) began its process for a 2018 HMP update.

This HMP update has several inter-related purposes:

- Provide overviews of the hazards that threaten the County
- Characterize the people and property at risk from the hazards
- Describe the planning process
- Identify vulnerabilities and assess risks from specific hazards
- Identify and prioritize mitigation action items while drawing from and adding to other community plans and programs

Participating communities in the 2018 Hays County Mitigation Plan Update are:

Village of Bear Creek

City of Hays

City of Niederwald

City of Wimberley

City of Buda

City of Kyle

City of San Marcos

City of Woodcreek

City of Dripping Springs

City of Mountain City

City of Umland

Hays County

Organization of the Plan

The Hays County Hazard Mitigation Plan Update is made up of one main plan document with supporting Appendices and 12 Community Annexes, one per planning area. The main plan document provides information regarding the plan process and methodology and regional level hazard profiles that address all participating communities. Each annex provides the data and analysis relevant to the respective planning area.

Hays County Hazard Mitigation Plan - Executive Summary

The four chapters within the main Plan document correspond to the four phases of the planning/plan update process, to include:

1. Organize and Review
2. Risk Assessment
3. Mitigation Strategy
4. Finalize (Approval and Adoption)

The content of these chapters, as well as that of the Community Annexes, closely follows guidance from FEMA's G318 Local Mitigation Planning Workshop, FEMA's Local Mitigation Planning Handbook, and FEMA's Local Mitigation Plan Review Guide.

The Planning/Update Process

As noted above, the update process consisted of four phases. Chapter 1 outlines the details of the development of the process and the schedule for planning activities. Throughout the process, special effort was made to ensure public involvement was welcomed and encouraged. Feedback was taken through a Public Survey that was advertised through multiple websites, social media, newsletters, emails and even through announcements at Commissioners' Court and City Council meetings. The public was provided a second opportunity to participate in the planning process when the final draft was posted on the Hays County website for public review and comment. Printed copies of the document were also made available for review at multiple locations within the County.

Planning activities also included stakeholders who were invited from industry, academia, and the private sector. Further information regarding stakeholders and the planning process can be found in Chapter 1 of the plan.

Hays County Office of Emergency Services and Hays County Grant Administration led the update effort and coordinated all meetings for the process. The primary point of contact for the HMP update is

Ms. Kharley Bagley Smith
Emergency Services Director/Emergency Management Coordinator
Hays County Office of Emergency Services
712 S. Stagecoach
San Marcos, TX 78666
Kharley.smith@co.hays.tx.us
(512)393-7300

Flood Damage Hays County, Texas



Hazards and Risks

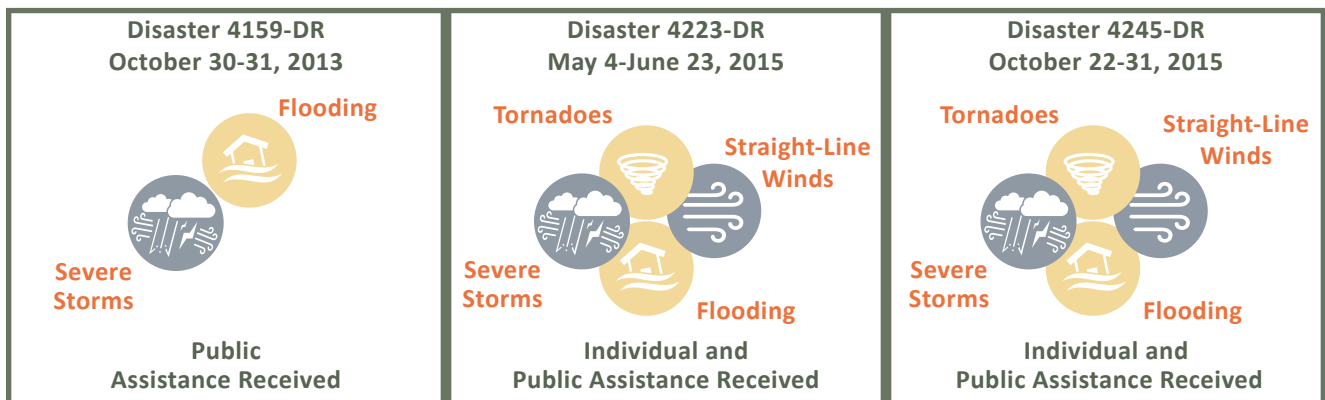
Chapter 2 of the main plan document includes hazard description and extent scale information, which apply to all participating communities. The State of Texas Hazard Mitigation Plan was used as the source of data for the hazard description information. Hazard location maps, community extent, history of significant events, probability of future events, as well as impact and vulnerability summaries can be found in Section 2 of each Community Annex for hazards that are not regional in nature. All hazard profile elements for hazards that occur on a regional scale where county-wide data application was appropriate for all profile elements are contained within Chapter 2 of the main plan document rather than individual community annexes.

A total of 13 hazards were profiled by the MPC. The hazards included:

- | | |
|-------------------------|--------------------------------|
| 1. Drought | 8. Expansive Soils |
| 2. Extreme Heat | 9. Floods |
| 3. Severe Winter Storms | 10. Hurricanes/Tropical Storms |
| 4. Lightning | 11. Earthquakes |
| 5. Hailstorms | 12. Dam/Levee Failure |
| 6. Windstorms | 13. Wildfires |
| 7. Tornadoes | |

Expansive Soils was added to the 2018 update as new hazards that had not been previously profiled for Hays County.

Hazard data also included details on the 3 Federal disaster declarations experienced by Hays County since the last update period. Information from these events was used to update and re-prioritize efforts within the plan. Those declarations are shown below:



Hazard identification and risk analysis was followed by hazard risk prioritization. Risks were ranked for each hazard using a quantified, formula-based Hazard Ranking Utility. This calculation included consideration for risk perception from members of the public (derived from Public Survey results) and analysis of data by planners from the MPC. This analysis included quantifying the past and possible impact from hazard events to Health/Safety, Property and Business Continuity. Each individual community risk ranking can be read in the respective Community Annex. The top 3 ranked hazards among all

Hays County Hazard Mitigation Plan - Executive Summary

communities were Floods, Wildfire and Drought.

Summary of Goals and Actions

Mitigation strategy goals were modified as part of the plan update process. The MPC voted to reduce the number of goals from seven hazard-specific goals found in the 2011 plan to 3 plan-wide strategic goals.

The 2018 Mitigation Strategy goals are:

1. Enhance the abilities of Hays County and the communities within its boundaries to provide protection of life, property, economy and natural systems from natural hazards.
2. Mitigate the vulnerabilities existing within hazard areas in order to lessen impacts on safety, damage to critical infrastructure/facilities and the capabilities of emergency responders.
3. Incorporate measures that assist with the improvement of water conservation efforts in Hays County.

The primary types of mitigation actions vary from non-structural solutions such as plans, regulations, education and awareness programs to structure and infrastructure projects and natural systems protection. Over 230 diverse mitigation actions designed to reduce structural and social vulnerability to the identified hazards are included in the plan. The mitigation strategy includes action status and modifications for existing actions as well as details regarding new actions added during the update process.

Approval and Adoption Processes

Chapter 4 discusses approval and adoption of the updated plan. The Hays County Commissioners Court and each participating City/Village Council was responsible for approving and adopting the Hays County 2018 Hazard Mitigation Plan Update. The Commissioners Court reviewed and approved the plan update on (insert date XX). Each community adoption date is listed in Chapter 4, Table 4.1.

Implementation Process

For each mitigation action identified, the plan identifies the lead agency, resources needed, time period for implementation. Each lead agency will factor the action into their work plans and schedules when possible. Annual reports on the status of implementation, including obstacles to progress, will be submitted by mitigation planners from each community to the Hays County Office of Emergency Services.

Incorporation/Integration with Other Plans

Each Community Annex identifies how mitigation efforts found in existing resources, such as plans, programs, and regulations, can be incorporated into the HMP. In turn, the annexes also highlight opportunities for integrating new HMP actions back into existing resources in order to tie mitigation priorities into existing community processes and goals. It also details how communities have previously achieved integration through the last plan update cycle.

Monitoring and Updating Processes

Chapter 4 of the main plan document describes the general schedule and procedures for ensuring that the County's HMP remains current. This table also provides a combination of trigger events that will initiate future amendments and future updates to the HMP. The Hays County Office of Emergency Services is responsible for overall Plan updates.

Acknowledgments

Hays County Hazard Mitigation Plan - Executive Summary

Acknowledgment to Jeffrey S. Ward & Associates, Inc. (JSWA) and Halff Associates for the coordination of the planning process for the communities. In addition, special recognition for stakeholder participation from Hays County GIS, San Marcos Police Department, Hays CISD, San Marcos GIS, Hays County Office of Emergency Management, Hays County Sheriff's Office, and San Marcos River Foundation for their contributions to the planning effort during the risk assessment and mitigation strategy portions of the plan.



Introduction

Background of Hazard Mitigation and Mitigation Planning

Hazard mitigation is the use of long and short term planning strategies to reduce or alleviate the loss of life, personal injury and property damage that can result from a disaster. It involves strategies such as planning, policy changes, programs, projects and other activities that can mitigate the impacts of hazards. It is impossible to predict exactly when and where disasters will occur or the extent to which they will impact an area. However, with careful planning and collaboration among public agencies, stakeholders, and citizens, it is possible to minimize losses that disasters can cause. The responsibility for hazard mitigation lies with many, including private property owners; business and industry; and local, State, and Federal government.

The Disaster Mitigation Act of 2000 (DMA) is Federal legislation that requires proactive, pre-disaster planning as a prerequisite for certain funding available under the Robert T. Stafford Act. The DMA encourages State and local authorities to work together on pre-disaster planning. The planning network called for by the DMA helps local governments articulate accurate needs for mitigation, resulting in faster allocation of funding and more cost-effective risk reduction projects. An approved Hazard Mitigation Plan (HMP) is a requirement in order for the County to remain eligible for some project grants that are administered by the Texas Division of Emergency Management (TDEM), the Texas Water Development Board (TWDB) and the Federal Emergency Management Agency (FEMA).

History of Hays County Mitigation Planning

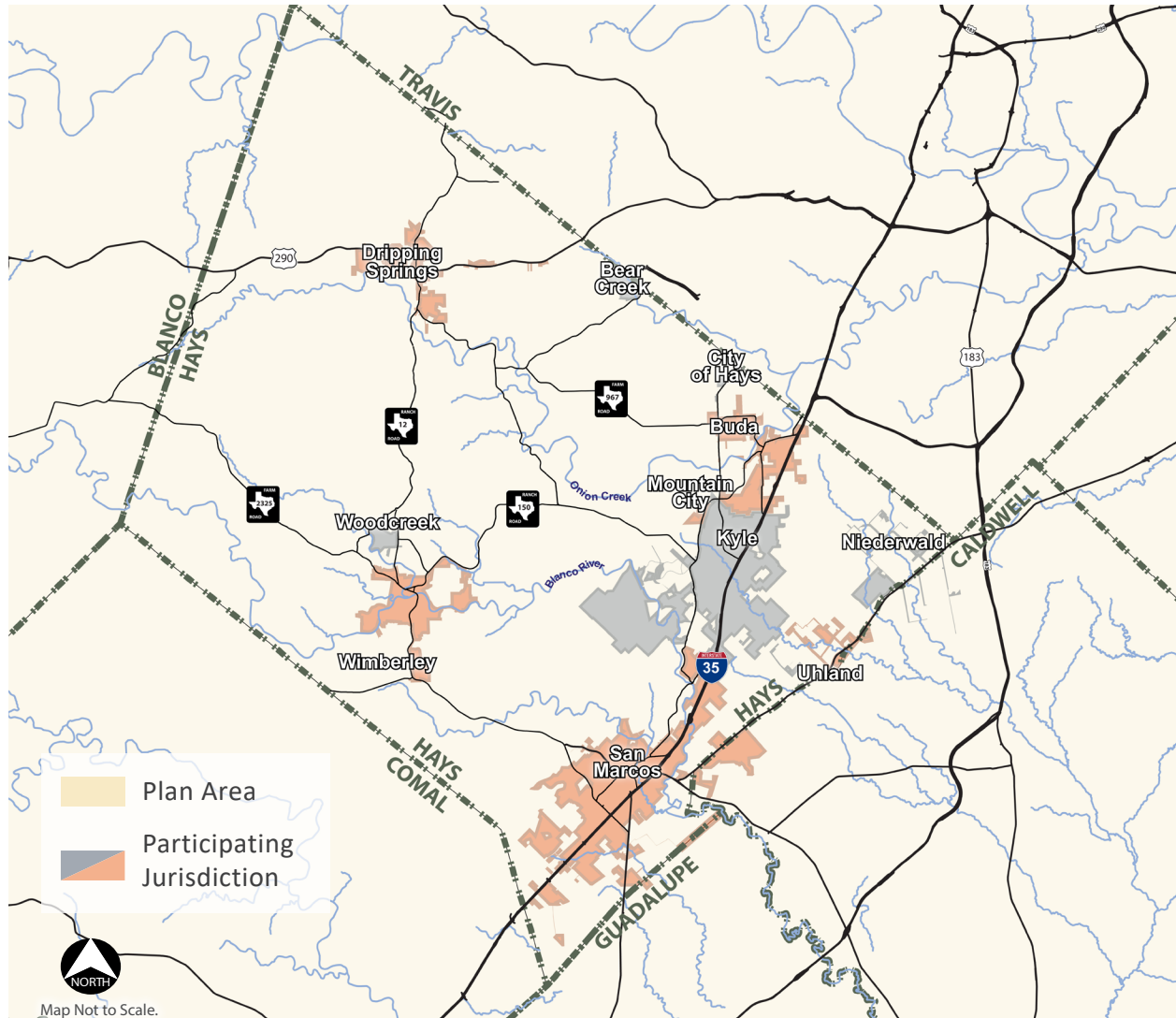
Hays County and a partnership of local governments within the County have developed and maintained an HMP to reduce risks from natural hazards and to comply with the DMA. In April 2003, Hays County initiated the development of its first HMP. The initial Hays County HMP was approved in 2006, and established the County's long-term strategy for reducing its risks from natural hazards. (A copy of the original Plan is available through the Hays County Office of Emergency Services.) The 2011 Hays County HMP update included reevaluation of the original hazards, risk assessment, mitigation goals, strategies, and mitigation priorities to identify changes and updates that may have occurred since approval and adoption of the original plan.

The 2018 Hays County Hazard Mitigation Plan Update

In 2016, Hays County began its second update process of the HMP, which included evaluating and revising the actual update process, the capability assessment, risk assessment, mitigation strategy and plan maintenance procedures.

Planning Area

Figure ES.1, Hays County HMP Update Planning Area



Participating communities in the 2018 Hays County Mitigation Plan Update are:

Village of Bear Creek

City of Hays

City of Niederwald

City of Wimberley

City of Buda

City of Kyle

City of San Marcos

City of Woodcreek

City of Dripping Springs

City of Mountain City

City of Uhland

Hays County

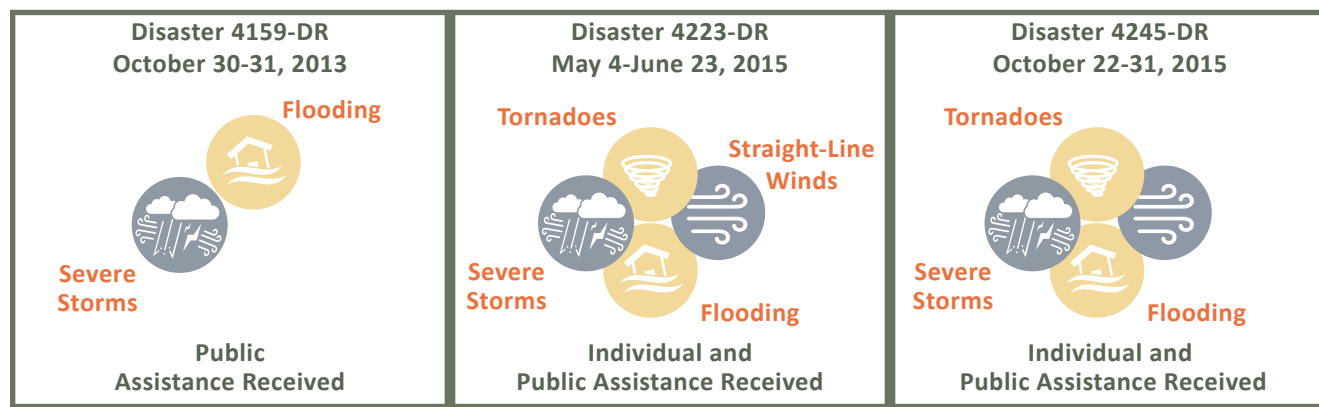
Hays County Hazard Mitigation Plan - Introduction

This HMP update has several inter-related purposes:

- Provide overviews of the hazards that threaten the County
- Characterize the people and property at risk from the hazards
- Describe the planning process
- Identify vulnerabilities and assess risks from specific hazards
- Identify and prioritize mitigation action items while drawing from and adding to other community plans and programs

Hays County experienced a number of significant hazard events between 2011 and 2016, which led to shifts and changes in hazard data for the participating communities. The update process included the incorporation of these events and the associated data. Of these events, 3 received Federal disaster declarations.

Federal disaster declarations that included Hays County are shown below:





Chapter 1: Organize and Review

The 2018 Hazard Mitigation Plan Update Phases 1-3 were conducted from November 2016 to March 2017, utilizing funding from the Hazard Mitigation Grant Program. Update activities will continue through TDEM review and FEMA approval pending adoption of the plan, and the adoption of the plan document by participating entities. Final approval from FEMA will be given following the submission of jurisdiction adoption signature pages.

Kick-off for the update process was coordinated by the Hays County Grant Administrator and Emergency Services Director. The kick-off meeting and initial meeting of the MPC for the 2018 update was held from 1:00 pm to 3:00 pm at Kyle Fire Station #1 in Kyle, Texas on December 8, 2016. During this meeting, the Hays MPC reviewed the planning area, confirmed the resources that were available for planning activities, reviewed the process for the upcoming update, and decided upon the outreach strategy for the process. In addition, the MPC decided to add additional hazards to the plan. Hazard additions are outlined in Chapter 2: The Risk Assessment.

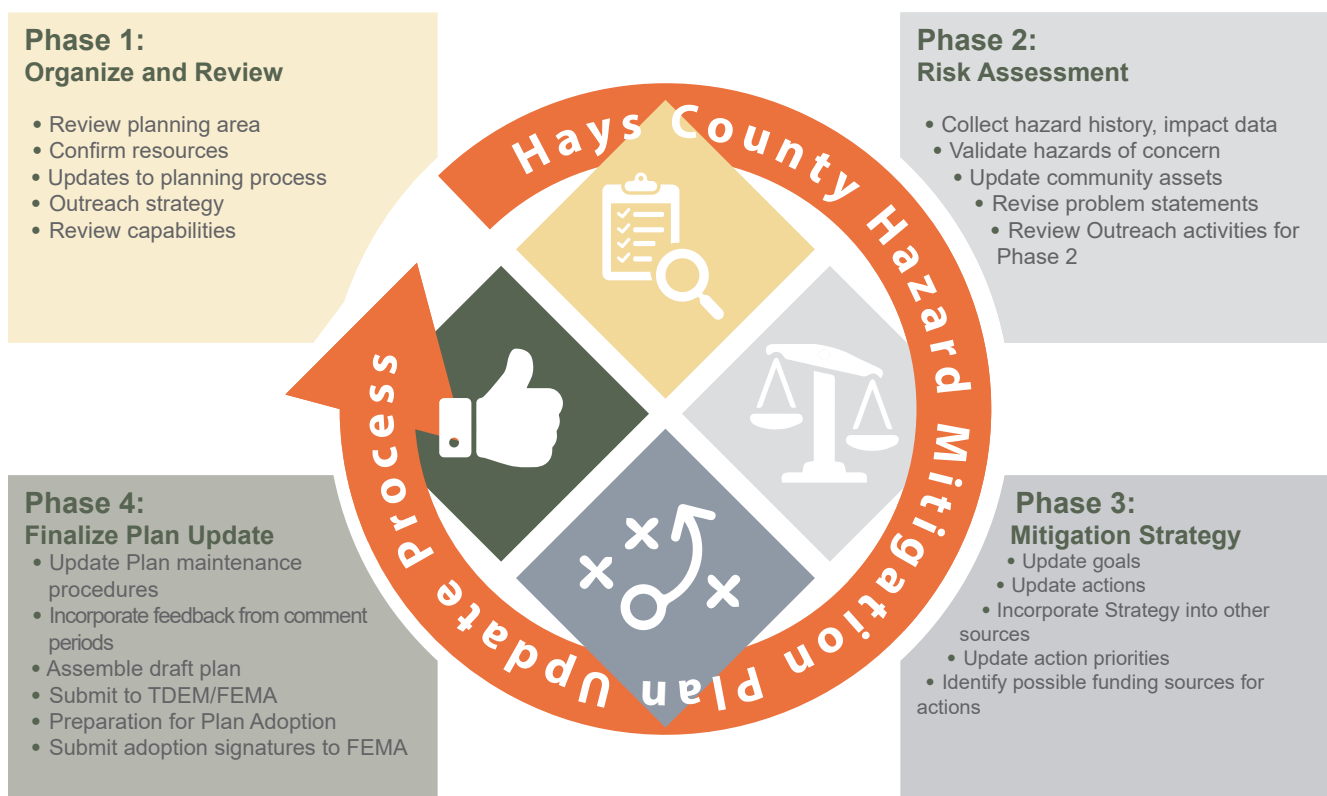
1.1 Purpose of Organize and Review Process

To update and document long-term policy changes and actions that can reduce risk and loss experienced from natural hazards

1.2 Hays County Plan Update Goals

- Describe the plan update process
- Provide updated overviews of existing and new hazards that threaten the County
- Characterize the people and property at risk from hazards
- Identify vulnerabilities and assess risks from specific hazards
- Identify and prioritize mitigation action items
- Incorporate existing mitigation strategies from other community resources
- Integrate new mitigation action items into other community resources

Figure 1.1, Hays County Hazard Mitigation Plan Update Process





1.3 Hays County Hazard Mitigation Plan Update Process and Schedule

The update took place using the 4 phases of Mitigation Planning (shown in Figure 1.1), to include: Each of the 4 plan update phases and their respective tasks were conducted within the 5-month plan update period, following the Plan Update Schedule as closely as possible. The majority of the activities were conducted according to the schedule shown in Table 1.1.

Table 1.1, MPC Plan Phase Task Schedule

Phase	Task	Month					
		N	D	J	F	M	A
Phase 1 Organize and Review	Review/Revise Planning Area						
	Identify Supplementary/Complementary Plans						
	Identify Planning Resources (Human/Technical/Financial)						
	Facilitate Kick-Off Meeting						
	Revision of Planning Process to incorporate update						
	Update Outreach Strategy						
	Analyze, evaluate and incorporate plan process feedback						
	Review Community Capabilities (existing plans, studies, reports and tech info incorporated into plan)						
Phase 2 Risk Assessment	Gather updated risk assessment data (hazard history, impact)						
	Validate hazards of concern for the planning area						
	Identify Community Assets (Vulnerable populations, critical facilities, infrastructure, etc)						
	Revise Problem Statements						
	Format data for use in public involvement strategy						
Phase 3 Mitigation Strategy	Update Mitigation Plan Goals						
	Review and Update Mitigation Actions with new Risk Assessment data						
	Seek opportunities to incorporate Mitigation Strategy actions into Other Community Plans						
	Re-prioritize Mitigation Actions						
	Identify Possible Funding Sources for Mitigation Actions						
Phase 4 Maintenance/ Implementation/ Update/ Adoption	Evaluate/revise past plan maintenance procedures						
	Incorporate feedback from planning team, stakeholders and public						
	Assemble draft plan update (on-going process throughout planning process)						
	Preliminary Plan Review by Hays County Commissioners Court prior to public comment period						
	Draft Plan Update submitted to TDEM, and then FEMA						
	Final plan adoption at Commissioners Court and Local Jurisdictions after Approval Pending Adoption letter is received from FEMA						
	Adoption signature pages submitted to FEMA (activity occurs outside of planning process period)						



1.4 Jurisdictions/Planners Participation

The mitigation plan updates were performed by the Hays MPC, which is comprised of 12 jurisdictions. Membership was determined by virtue of elected or appointed position, or delegated as an assignment of duties by elected officials in the respective community. The members of each community that served as planners are shown in Figure 1.2, MPC Membership.

Figure 1.2, Mitigation Planning Committee Membership

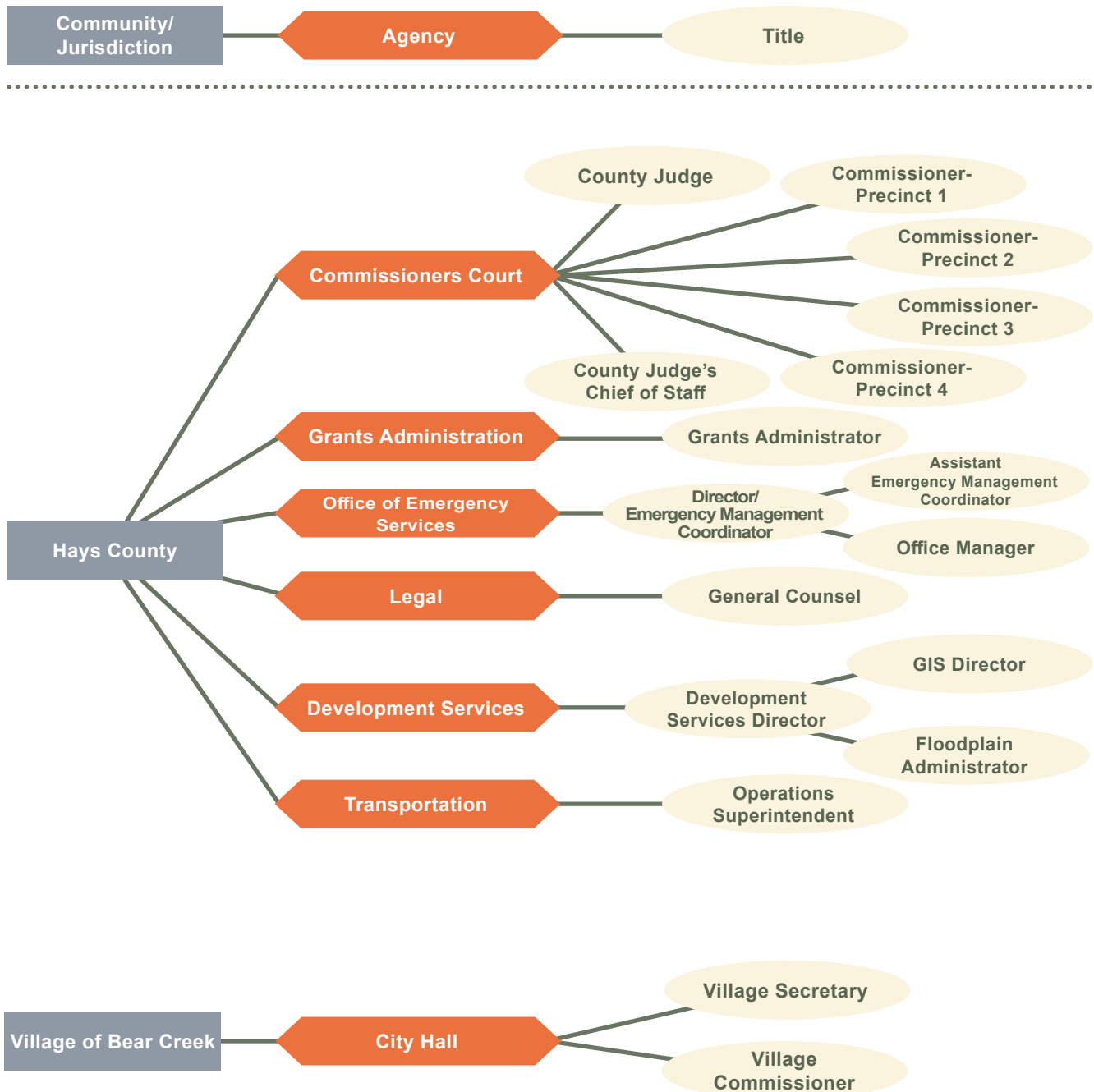


Figure 1.2, Mitigation Planning Committee Membership (Continued)

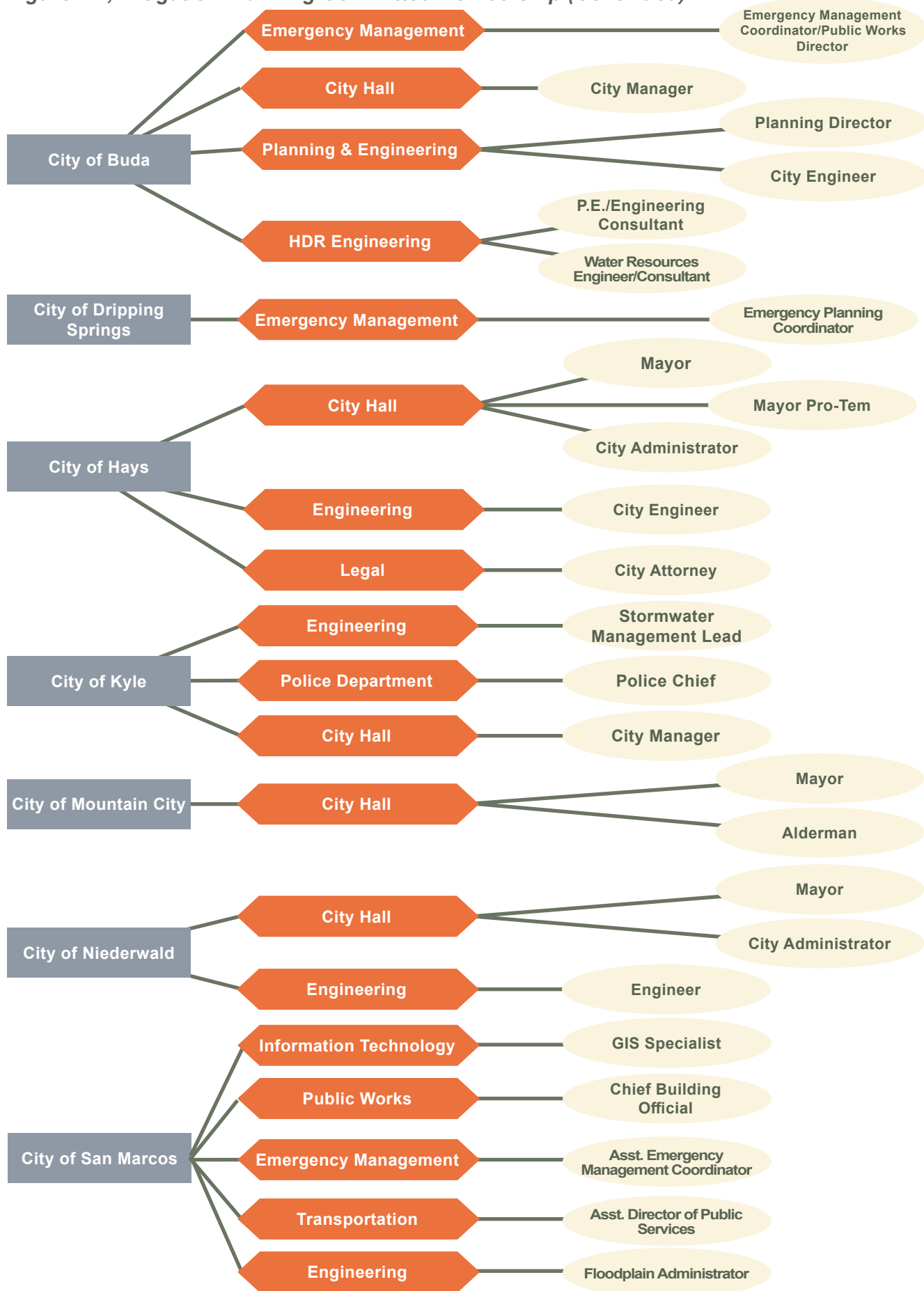
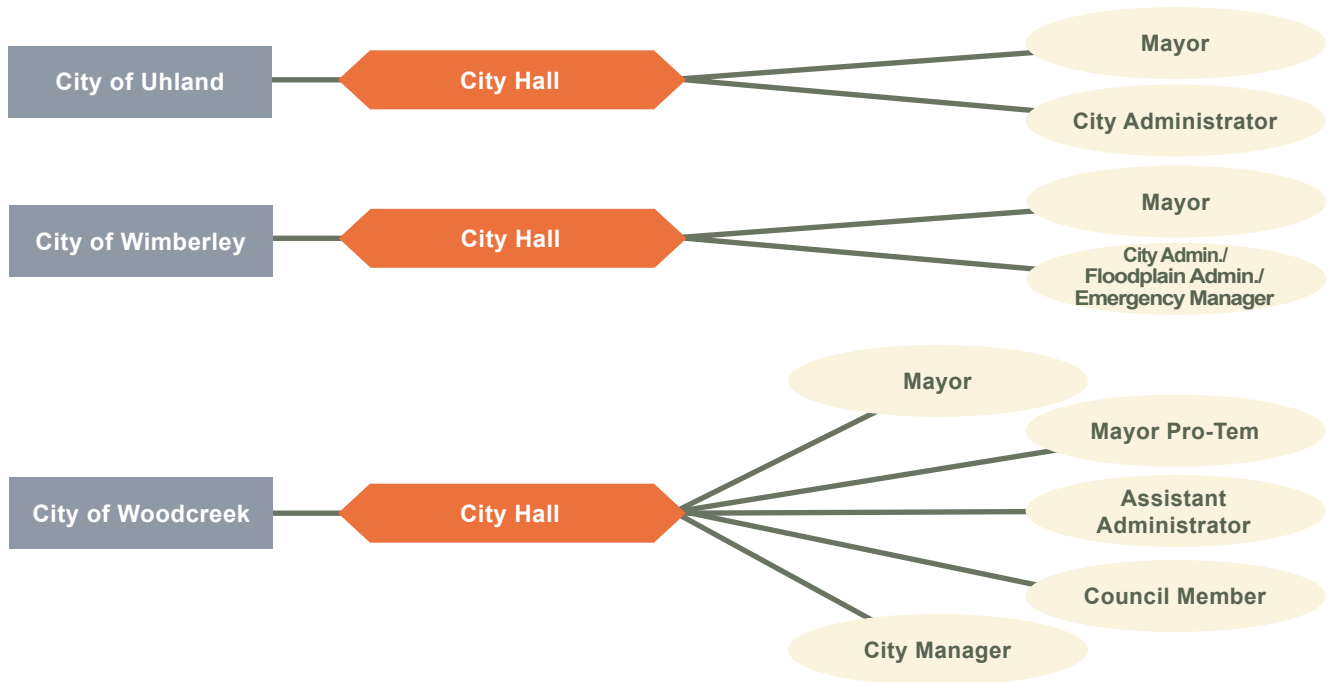


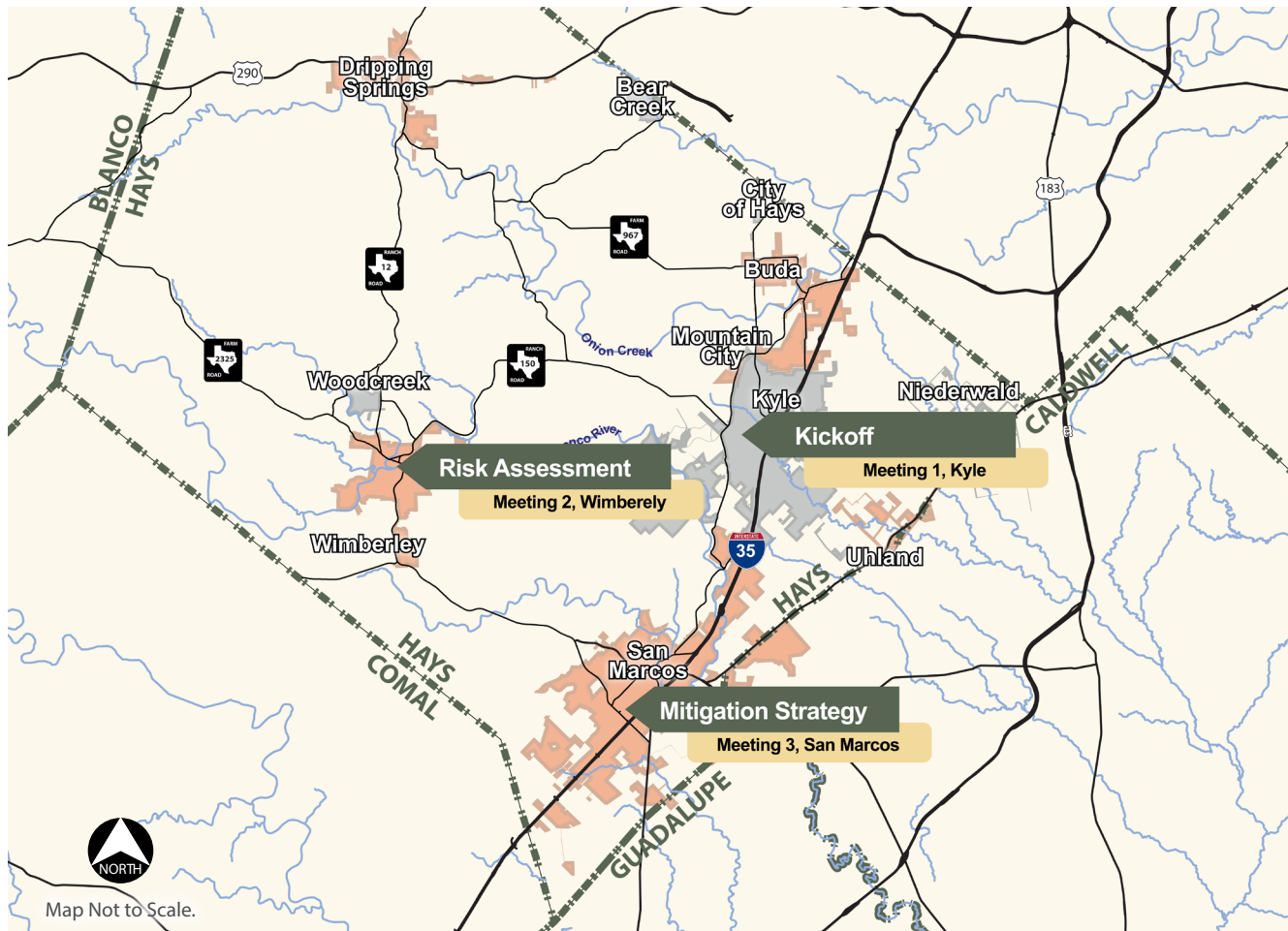


Figure 1.2, Mitigation Planning Committee Membership (Continued)



The Hays MPC met 3 times for the Mitigation Plan Update, shown in Figure 1.3, Meeting Schedule.

Figure 1.3, Meeting Schedule



Hays County Hazard Mitigation Plan

Members of the Hays MPC participated in multiple activities throughout the planning process, to include:

Meetings



- Kick-Off
- Risk Assessment
- Mitigation Strategy

Data Submission



- Planner's Survey
- Data Collection Spreadsheet/GIS Data
- Planning Worksheets
- Phone Interview

Public Involvement



- City Council/Commissioners Court Agenda Items
- Public Survey Posting/Collection

Outreach documentation can be found in Appendix A. Meeting Agendas and Action Items are located in Appendix B. Each community's contributions and participation efforts can be found in their community Annex under Plan Update Process.

1.5 Stakeholders Participation

Members of the MPC were asked to provide a listing of non-MPC members within their communities who would provide valuable feedback to the plan update process. These non-decision-making planning partners were designated as Stakeholders. This was done using the Planners/Stakeholder Worksheets (Figure 1.4).

Stakeholder Invitations/Participation

Identified Stakeholders received email invitations to the Planning Update Risk Assessment and Mitigation Strategy Meetings shown in Figure 1.5. Those who attended were involved in discussions/working sessions that took place at each meeting. Each of the invited stakeholders jurisdictions, agencies and titles are provided below in Table 1.2, Plan Stakeholders.

Local Agency	POC Name	Is this person also on the planning team?
Building Code Enforcement	Maria Perez	
City Management/County Administration	Scott Sellers	
Emergency Management		no
Fire Department/District		no
Floodplain Administration		no
Geographic Information Systems (GIS)	Steve Gibson	
Parks and Recreation	Kerry Gibson	
Planning/Community Development	Harold Gibson	
Public Works	Harold Gibson	
Stormwater Management	Kathy Roeker	
Transportation (Roads/Bridges)	Kathy Roeker	
City Council/Board of Commissioners	Mayer Webster	yes
Planning Commission		
Regional/Metropolitan Planning Organizations		no
City/County Attorney's Office		no

Figure 1.4, Planner/Stakeholder Worksheet

Figure 1.5, Meeting Invitation

Good Morning,

You or your organization has been identified by a local community planner as a stakeholder (interested/affected party) for the Hays County Hazard Mitigation Plan Update process. The planning team, made up of community officials from throughout Hays County, is working to update this plan that identifies actions for reducing and mitigating the risk from natural hazards (flood, tornado, severe winter, etc...) affecting Hays County and the communities within it. If your schedule allows, your insight would be valuable at a meeting being held on Thursday, January 12, 2017, from 1 p.m. to 4 p.m. at

Wimberley Community Center
14068 Ranch Road 12
Wimberley, TX 78676

Please register for the Hazard Mitigation Plan Update- Risk Assessment Meeting. <https://www.eventbrite.com/e/hays-county-hazard-mitigation-plan-update-risk-assessment-meeting-registration-30892049953>

If unable to complete registration on the Eventbrite site, please reply to this email and indicate who will attend from your organization so that the meeting facility can be prepared for the proper number of attendees.

JWSA and Halff Associates are providing coordination and facilitation support for this process for Hays County and participating communities utilizing FEMA mitigation grant funding. Any questions regarding this meeting can be directed to Paloma Alaniz at palaniz@halff.com.

Thank you.




Table 1.2, Plan Stakeholders

Jurisdiction	Agency	Title
Aqua Texas	Water Company	Public Relations
Bastrop County	Neighboring Community	County Judge
Blanco County	Neighboring Community	County Judge
Bluebonnet Electric Cooperative	Utilities	Community Representative Manager
BR3T	Association	Executive Director
Buda Chamber of Commerce	Non-Profit	BACC Managing Director
Caldwell County	Neighboring Community	County Judge
CAMPO - Capital Area Metropolitan Planning Organization	Planning	Community Outreach Manager
Charter Communications	Cable and Internet Provider	Field Ops Manager
Charter Communications	Cable and Internet Provider	Director, Government Relations
Charter Communications	Cable and Internet Provider	Field Ops Manager
Chisolm Trail Fire Rescue	Fire Department/EMS	Fire Chief
City of Buda	Fire Department/EMS	Fire Chief
City of Buda	Police Department	Police Chief
City of Buda	Engineering/Public Works	Water Specialist
City of Buda	Economic Development	Secretary
City of Buda	Government	Mayor
City of Buda	Parks and Recreation	Director
City of Dripping Springs	Legal	City Attorney
City of Dripping Springs	Public Works and Development/ Planning/Transportation/ Streets	Director
City of Dripping Springs	Public Works and Development	Code Enforcement Manager and Building Official
City of Dripping Springs	Parks and Recreation	Manager
City of Dripping Springs	Environmental Health Department	City Sanitarian
City of Dripping Springs	Government	City Administrator
City of Dripping Springs	Government	Constable
City of Dripping Springs	Planning Commission	Chair
City of Dripping Springs	Government	Mayor
City of Kyle	Engineering	City Engineer/Floodplain Administration/Emergency Management/Stormwater
City of Kyle	Economic Development	Director
City of Kyle	GIS	GIS Analyst
City of Kyle	Engineering	Project Manager/Floodplain

Table 1.2, Plan Stakeholders (cont.)

Jurisdiction	Agency	Title
City of Kyle	Engineering	Floodplain Administrator
City of Kyle	Communications	Director
City of Kyle	Planning	Director of Planning
City of Kyle	Finance	Director
City of Kyle	Building	Building Official
City of Kyle	Government	City Manager
City of Kyle	Fire Department/EMS	Fire Chief
City of Kyle	Parks and Recreation	Director
City of Kyle	Government	Mayor
City of Kyle	Public Works	Director
City of Niederwald	Legal	City Attorney
City of San Marcos	Parks and Recreation	Assistant Director of Community Services
City of San Marcos	Government	Mayor
City of San Marcos	GIS	GIS Enterprise Manager
City of San Marcos	Police Department	Assistant Chief
City of San Marcos	Planning & Development	Director
City of San Marcos	Government	Assistant City Manager/CFO
City of San Marcos	Engineering	Senior Engineer
City of San Marcos	Fire Department	Assistant Fire Chief, Operations and Training
City of San Marcos	Police Department	Police Chief
City of San Marcos	Fire Department	Fire Chief
City of San Marcos	Parks and Recreation	Parks Operations Manager
City of San Marcos	Transportation	Stormwater Systems Manager
City of Wimberley	Building Code Enforcement	Public Works Assistant
City of Wimberley	Fire Department	Fire Chief
City of Wimberley	Environmental Health	Inspector
City of Wimberley	Parks and Recreation	Blue Hole Regional Park Manager
City of Wimberley	City Attorney	Attorney
City of Woodcreek	Cypress Point Property Owners Association	President
City of Woodcreek	Legal	City Attorney
City of Woodcreek	Planning	Director
City of Woodcreek	City Hall	Council member
City of Woodcreek	Woodcreek Property Owners Association	President
Comal County	Neighboring Community	County Judge




Table 1.2, Plan Stakeholders (cont.)

Jurisdiction	Agency	Title
Dripping Springs Chamber of Commerce	Non-Profit	Public Affairs
Dripping Springs HEB	Industry	Store Manager
Dripping Springs Home Depot	Industry	Store Manager
Dripping Springs ISD	School District	Superintendent
Dripping Springs ISD	School District	Emergency Management Coordinator
Dripping Springs Patriot Erectors	Industry	HR/Accounts Payable
Dripping Springs Water Supply	Water Corporation	Customer Support
Frontier	Cable	Government Relations
GBRA	River Authority	Engineer
GBRA	River Authority	Project 4 Community Representative
Goforth Water	Water Company	General Manager
Guadalupe County	Emergency Management	Coordinator
Hays CISD	School District	Director of Student Services
Hays CISD	School District	Superintendent
Hays County	Sheriff's Office	Sheriff
Hays County	Development Services	Natural Resources Manager
Hays County	Sheriff's Office	Lieutenant
Hays County	Parks and Recreation	Lead Parks Specialist
Hays Trinity Groundwater Conservation District	Water District	Public Outreach
LCRA	River Authority	Account Manager Senior
North Hays County Fire & Rescue	Fire Department/EMS	Fire Chief
North Hays County Fire & Rescue	Fire Department/EMS	Lieutenant
Pedernales Electric Cooperative	Electric Co-operative	Chief Executive Officer
San Marcos Chamber of Commerce	Non-Profit	Administrative Assistant
San Marcos CISD	School District	Superintendent
San Marcos Council of Neighborhood Associations	Non-Profit	Representative
San Marcos Greenbelt Alliance	Non-Profit	President
San Marcos River Foundation	Non-Profit	Program Director
South Hays Fire	Fire Department	Fire Chief
Spectrum (Charter)	Cable	Public Relations
Texas State Police Department	Police Department	Police Chief

**Table 1.2, Plan Stakeholders (cont.)**

Jurisdiction	Agency	Title
Texas State University	University	Emergency Management Coordinator
Travis County	Neighboring Community	Emergency Management Coordinator
Village of Bear Creek	Government	Mayor
Water Supply	Wimberley Water Supply Corporation	General Manager
West Travis County PUA	Association	Public Outreach
Wimberley Chamber of Commerce	Association	Public Outreach
Wimberley ISD	School District	Superintendent

1.6 Public Participation

Residents of Hays County and participating communities were given the opportunity to provide input on the planning process in several ways.

Public Survey



A Hays County Mitigation Plan Update Survey was posted on Survey Monkey at <https://www.surveymonkey.com/r/HaysHMPUpdatePublicSurvey>. Communities shared the survey using their websites, newsletters, and social media. Hard copies of the survey were even made available for populations that may not have access to computers or the Internet.

Figure 1.6, Hays County Public Participation Survey Results

Results shown as of February 15, 2017

Community	Participants	Community	Participants
Buda	243	Niederwald	0
Bear Creek	28	San Marcos	160
Dripping Springs	36	Umland	13
Hays	19	Wimberley	10
Kyle	23	Woodcreek	63
Mountain City	25	Hays County	109

Hays County Hazard Mitigation Plan

As of February 15, 2017, there were a total of 729 survey responses. Responses to the survey were directly integrated into the Risk Ranking activity of the Risk Assessment phase, as public perception of risk was included as a measurement in the ranking formula. This direct incorporation of their feedback provided not only a factor in the ranking of the risk associated with the hazards that their community faces, but also was a factor in the prioritization of Mitigation Strategy Actions. Details regarding the risk ranking can be found in Chapter 2: Risk Assessment. Details regarding the prioritization of Mitigation Strategy Actions can be found in Chapter 3: Mitigation Strategy.

Public Meeting Announcements

Communities made announcements at their public meetings using talking points that outlined the Mitigation Plan Update effort and invited public participation in the Public Survey (Figure 1.7). The full version of the talking points can be found in Appendix A.

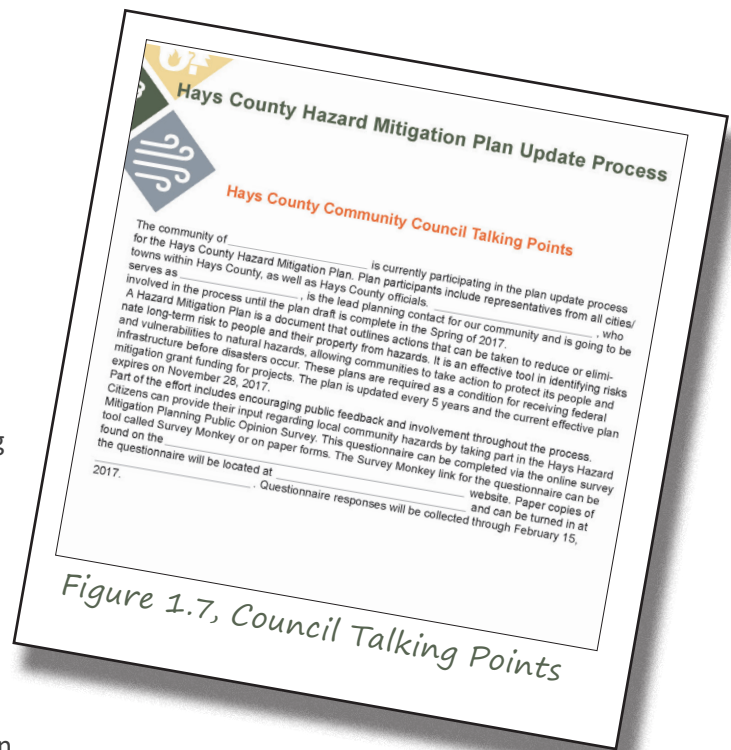


Figure 1.7, Council Talking Points

Planning Phase Newsletters



Through each phase of the plan update process, MPC planners were provided with newsletters that outlined the current phase of plan work and the deliverables that would result from them. The newsletters were provided in both hard copy and digital format. Examples of the newsletters can be found in Appendix A.

Public Meeting Invitation



Members of the local public in Wimberley were invited to attend the Risk Assessment meeting held in their community during Phase 2 of the planning process. Public comment cards were created to collect suggestions and opinions from those who attended the meeting. No members of the public attended the meeting despite the public invitation at the Wimberley City Council Meeting.

Plan Draft Public Review and Comment Period



Communities encouraged the public to review and provide comments regarding the draft plan via community/County website posting and hard copy display at public libraries and city halls. In addition, newspaper articles in the Austin American Statesman and San Marcos Record encouraged public participation in the plan draft review process (Figure 1.8). There were no comments received during the draft comment period. Any comments that would have been received would have been reviewed and incorporated into the final plan when possible and appropriate.

Figure 1.8, Public Comment Period Advertisements

82 AUSTIN AMERICAN-STATESMAN | FRIDAY, JULY 21, 2017

COMMUNITY NEWS

News:communitynews@statesman.com or 512-445-3863



82 AUSTIN AMERICAN-STATESMAN | WEDNESDAY, JULY 19, 2017

COMMUNITY NEWS

News:communitynews@statesman.com or 512-445-3863



HAYS COUNTY

Comments on hazard plan sought

The Hays County Commissioners Court has approved the draft 2017 Hazard Mitigation Plan for public comments through July 26.

Each incorporated city or village in Hays County, as well as the county, has an annex that provides an overview of natural hazards, summarizes past hazard events, describes how these events will be recognized and addressed, and provides potential actions to consider to minimize the effects of natural hazards on life and property.

An executive summary, the plan in its entirety and an annex for the 11 incorporated communities within the county as well as the unincorporated area of the county, can be found under the public comments section at bit.ly/2ufp1pn, along with information on how to submit comments.

— AMERICAN-STATESMAN STAFF

HAYS COUNTY

Comment on plan by Wednesday

The Hays County hazard mitigation plan public draft comment period will end Wednesday.

This year, Hays County asked for input regarding local community hazards by taking part in the Hays County hazard mitigation planning public opinion survey. The goal for the county was to come up with an updated Hays County mitigation plan.

The public draft is available for comment through Wednesday at bit.ly/2ufp1pn. Comments can be submitted by emailing hmp-comments@co.hays.tx.us or mail to Grants Administration Department, Hays County Government Center, Suite 1204, 712 S. Stagecoach Trail, San Marcos, TX 78666.

— AMERICAN-STATESMAN STAFF

Whether rain, fire or tornadoes, cities prepare for hazard plans

BY TIMOTHY STUCKEY

Whether it's flooding or fires or tornadoes — any kind of natural disasters — Hays County cities are coming together to put forth their updates on the 2017 Hazard Mitigation plan.

The 2017 Hazard Mitigation Plan, or HMP, has been approved for public comments through July 26.

Eleven incorporated cities in Hays County, and the county, have their own plans that provide overviews of natural hazards and

how best to respond in order to minimize the loss of life and property. The plans for each incorporated city and the county can be found on the county website.

"Each jurisdiction has the opportunity to adopt the plan; this is done by an affirmative vote of the city council," said Kay Allen, Dripping Springs Emergency Planning Coordinator. "Having done that, the obligation is to make a good faith effort to complete the action items specific to that jurisdiction; since the action items are tailored

to the jurisdiction's specific situation and needs, there is a strong motivation to follow through on completing them."

The 2017 HMP update is the most recent to the county's HMP since 2011. The HMP for Hays County was first initiated in 2003 in response to the Disaster Mitigation Act passed by Congress in 2000, which established a requirement that jurisdictions nationwide must develop hazard plans in the event of natural or man-made disasters.

Approved in 2006,

the Hays HMP was designed to help the incorporated cities within the county prepare for the hazards the areas are most susceptible to.

"Past hazards greatly influence these plans," said Kathy Roecker, Kyle's Stormwater Management Plan organizer. "Looking at past hazards assists in planning and preparing for future hazards."

For instance, flooding has been a consistent and troublesome issue in Hays County. Between

HAZARD PLAN, 4

Hazard Plan

Continued from pg. 1

1965 and 2010, Hays County received seven major Presidential disaster declarations, of which five were floods.

"The October 2015 floods brought some issues to the forefront that had not been obvious before," Allen said. "There is much more impervious cover in our area than in 2011 and that contributed to flooding in places that had never flooded before, such as the intersection of RR12 and HWY 290."

Residents are also strongly urged by their cities' leaders to participate in order to

provide an effective plan. Comments about the plan can be submitted to HMPComments@co.hays.tx.us or through regular mail to: Grants Administration Department, Hays County Government Center, 712 S. Stagecoach Trail, Suite 1204, San Marcos, Texas, 78666

"These plans are 'living plans,'" said Roecker. "Therefore comments, input and recommendations are vital to the implementation and success of the plan."

WHO'S SPEAKING UP?

As of March 10, 2017 the number of responses from residents in each particular area regarding the HMP is as follows:

Bear Creek: 28
Buda: 242
Dripping Springs: 36
Hays: 19
Kyle: 23
Mountain City: 25
Niederwald: 0
San Marcos: 160
Uhlman: 13
Wimberley: 10
Woodcreek: 63

To view the plans, see: www.co.hays.tx.us/hazard-mitigation-plan-update.aspx.



San Marcos Daily RECORD

sanmarcosrecord.com



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SAN MARCOS CISD Election item pulled from board agenda

ROBIN BLACKBURN
STAFF REPORTER

San Marcos CISD trustees addressed some election issues at their meeting Monday night, but not all of the issues they were expected to handle.

The board of trustees was expected to hear a presenta-

HAZARD MITIGATION

Emergency plans up for public review

ANITA MILLER
MANAGING EDITOR

It could be drought. It could be flood. It could be wildfire, or another kind of event that impacts Hays County — in whole or in part — in the future. While the nature of coming hazards aren't known, county officials are taking steps to make sure a mitigation plan is in effect.

A draft 2017 Hazard Mitigation Plan has already been approved by the Commissioner Court. The public may submit comments about it through July 26. "Each incorporated city or village in Hays County, as well as the county, has an annex that provides an overview of natural hazards, summarizes past hazard events, describes how these

events will be recognized and addressed, and provides potential actions to consider to minimize the impact of hazards on life and property," county spokeswoman Lauren Chernow said in a press release.

The plan is a requirement if local communities are to stay eligible for grant funding from the Federal Emergency Management

Agency (FEMA).

After the end of the public comment period, FEMA and the Texas Division of Emergency Management will review comments. After that, a final hazard mitigation plan will be presented to commissioners and to the ruling bodies of all municipalities.

The county hired consultants Jeffrey S. Ward &

Associates and Half Associates Inc. to facilitate the planning process and draft the documents.

The draft, along with an executive summary and the annex for each of the county's 11 incorporated communities, (along with unincorporated areas) is available on the county's web page at www.co.hays.tx.us.





1.7 Resource Review

The resource review was conducted with the use of a data collection spreadsheet that summarized community level information, to include:

- GIS Data
- Programs
- Plans and Studies
- Ordinances, Policies and Agreements
- Financial Resources
- People and Roles within Organization

Details on the specific data that was provided for each community is outlined in their respective community annex.

Review and Incorporation of Other Sources

Using a data collection spreadsheet, the MPC collected plans, studies, ordinances, policies and agreements that were each reviewed for possible incorporation of existing actions, regulations, policies into the Hays HMP. Each community annex includes a listing of the documents that were submitted and how the content was considered for incorporation in the mitigation plan. Documents requested for consideration included, when applicable and available:

- Comprehensive Plan
- Capital Improvements Plan
- Economic Development Plan
- Local Emergency Plan
- Continuity of Operations Plan
- Transportation Plan
- Stormwater Management Plan
- Community Wildfire Protection Plan
- Disaster Recovery, Parks, Climate Change Adoption, etc
- Building Codes
- ISO Rating
- Plan Site Reviews
- Zoning/Subdivision/Floodplain ordinances
- Flood Insurance Rate Maps
- Land Acquisition or Open Space Policies/Agreements

The State of Texas Hazard Mitigation Plan was also referenced for potential incorporation opportunities.



1.8 Maintenance

Table 1.3 lists the method, schedule, and responsible agent for the monitoring, evaluation, and updating of the adopted 2018 HMP within the Plan's 5-year cycle.

Table 1.3, Hays County Hazard Mitigation Plan Maintenance Schedule

Task	Scope	Method	Schedule	Responsible Agent
Monitoring	Planning Process	Emergency Management Coordinator (EMC) will track changes in mitigation resources and contacts/audit changes in MPC planning team and contact information through phone or email inquiry annually.	Every 12 months	EMC, Office of Emergency Services, Hays County
	Risk Assessment	EMC will monitor future significant hazard occurrences within the County to ensure additional event information is available through documentation of event magnitudes, locations, and impacts.	Every 12 months or after significant event	EMC, Office of Emergency Services, Hays County
	Mitigation Strategy	MPC Planners will conduct reviews of mitigation action items using Mitigation Action Progress Report Worksheets (illustrated in Figure 1.9) and submit to EMC for compilation.	Every 12 months	MPC Planners (Title/ Agency of responsible agent located in individual community annexes) and EMC, Office of Emergency Services, Hays County
	Implementation	EMC will review mitigation action items and research additional/ newly available funding resources annually to assess opportunities for implementation.	Every 12 months	EMC, Office of Emergency Services, Hays County
		EMC will track and document if Plan integration efforts have been successfully integrated.		



Table 1.3, Hays County Hazard Mitigation Plan Maintenance Schedule (cont.)

Task	Scope	Method	Schedule	Responsible Agent
Evaluation	Planning Process	MPC Planners will evaluate if established public outreach survey methods are providing sufficient feedback by identifying percentage of population participating in surveys.	Every 18 months	MPC Planners (Title/ Agency of responsible agent located in individual community annexes) and EMC, Office of Emergency Services, Hays County
	Risk Assessment	EMC will evaluate newly collected hazard occurrence data to assess whether the information will impact the Plan's occurrence, probability, extent, and impact elements.	Every 12 months	EMC, Office of Emergency Services, Hays County
	Mitigation Strategy	EMC will review mitigation actions annually and evaluate current feasibility in conjunction with new priorities and current funding research considerations.	Every 18 months	EMC, Office of Emergency Services, Hays County
	Implementation	EMC will evaluate whether the integration efforts have been successful through determination of positive results, new ordinances or policies, or through MPC Planner feedback.	Every 18 months	EMC, Office of Emergency Services, Hays County
Updates	Planning Process	EMC will incorporate edits/additions/ omissions of mitigation resources and changes in MPC planning team into HMP from monitoring activities.	Every 18 Months	EMC, Office of Emergency Services, Hays County
	Risk Assessment	EMC will incorporate documented hazard occurrence data and results of evaluation of new hazard events with Risk Assessment of HMP.	Every 18 months	EMC, Office of Emergency Services, Hays County
	Mitigation Strategy	EMC will update hazard mitigation status to reflect those that have been completed or canceled.	Every 12 months	EMC, Office of Emergency Services, Hays County
	Implementation	EMC will update the integration process by removing implementation or integration efforts that were ineffective.	Every 18 months	EMC, Office of Emergency Services, Hays County

Table 1.4, Public Involvement for Updates

Activity	Public Involvement	Method Available
Monitoring	The public will be given notice when items will be reviewed and receive the opportunity to review the notes from any notable developments through public announcement.	Newspaper (Austin American Statesman, San Marcos Daily Record, San Marcos Mercury, Hays Free Press) / Social Media
Evaluation	The public will be given a means to voice their opinion on the completed actions, via survey and email.	SurveyMonkey/Paper Survey
Updates	Once updates are made, the changes will be recorded in a public revision history document.	Newspaper (Austin American Statesman, San Marcos Daily Record, San Marcos Mercury, Hays Free Press)/Social Media/ Council Meeting Announcements/ SurveyMonkey


Figure 1.9, Hays County Mitigation Action Progress Reports

Hays County Hazard Mitigation Plan Update
Mitigation Action Progress Report Form

Progress Report Period	From Date:	To Date:	
Action/Project Title – No.			
Jurisdiction			
Lead Department			
Contact Name			
Contact Phone/Email			
Project Status	<input type="checkbox"/>	Project completed	
	<input type="checkbox"/>	Project canceled	
	<input type="checkbox"/>	Project on schedule	
	<input type="checkbox"/>	Anticipated completion date: _____	
	<input type="checkbox"/>	Project delayed	
		Explain: _____	

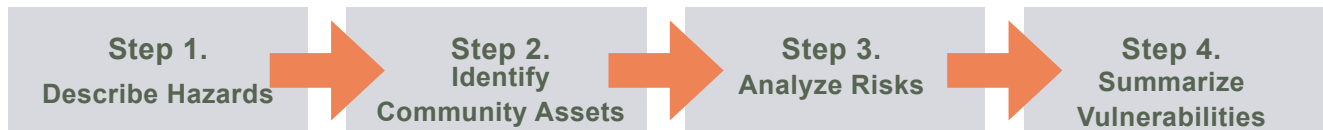
	<input type="checkbox"/>	Has this project been incorporated into the development of other plans or policies?	
		List plans/Explain: _____	
<p>1. What was accomplished for the project during this reporting period?</p> <p>_____</p> <p>_____</p>			
<p>2. What obstacles, problems, or delays did the project encounter?</p> <p>_____</p> <p>_____</p>			
<p>3. If completed, is the project still relevant? Should the project be changed or revised?</p> <p>_____</p> <p>_____</p>			
<p>4. Other Comments</p> <p>_____</p> <p>_____</p>			

Chapter 2: Risk Assessment

“The risk assessment provides the foundation for the rest of the mitigation planning process, which is focused on identifying and prioritizing actions to reduce risks to hazards.” –FEMA Local Mitigation Planning Handbook, 2013

Risk Assessment activities were conducted at a 2nd MPC meeting held from 1 pm to 4 pm on January 12, 2017 at the Wimberley Community Center in Wimberley, Texas. During the meeting, the four steps of the Risk Assessment process were reviewed, with information provided for each. The steps are shown below.

4 Step Process:



The hazard profiles within this Chapter include descriptions of each natural hazard, the hazard location, and the extent scale used for measuring hazard event magnitude.

Historical weather and hazard occurrence data and applicable national datasets were used to update this chapter and each jurisdiction-specific annex hazard profiles. The history of events within each jurisdiction (emphasis on those occurring from 2011-2016), probability of future events within the jurisdiction, and impact of past and potential events in the jurisdiction were also determined and updated. State and national datasets were used to determine occurrence, extent, and the respective probabilities rather than verbal testimonies in an effort to retain data consistency. Verbal testimony, when available, was integrated into impact or vulnerability statements.

2.1 Step 1. Describe Hazards

Expansive Soils was added to the HMP during Phase 1, as communities determined the hazard profiles to be included in their plans. There were also modifications to the State (Texas Division of Emergency Management) classifications of hazards in the Texas State Hazard Mitigation Plan and those changes needed to be incorporated into the update. These changes are shown in Table 2.1.

Table 2.1, 2011 vs 2018 Hays County Proposed Natural Hazards (non-ranked)

2011 Hays County Proposed Natural Hazards	2018 Hays County Proposed Natural Hazards
Floods (Riverine and Shallow)	Floods
Tornadoes	Tornadoes
Winter Storm, Extreme Cold, Ice Storm	Severe Winter Storms
Dam Failure	Dam/Levee Failure
Wildfire / Brush Fire	Wildfires
Tropical Storms and Tropical Cyclones	Hurricanes/Tropical Storms
Drought	Drought
Seismic/Earthquake	Earthquakes
Hail Storm	Hailstorms
Extreme Heat	Extreme Heat
Severe Thunderstorm/High Winds	Windstorms
	Lightning
	Expansive Soils





Summary of Changes

Severe Thunderstorm/High Winds (2011) was split into two hazards to adopt hazard profile categories used by the Texas Division of Emergency Management's State Hazard Mitigation Plan for hazards. The two hazards (2018) are:

- Lightning
- Windstorms

In addition, a new profile was added for:

- Expansive Soils

Modification of name only for:

- Winter Storm, Extreme Cold, Ice Storm- changed to Severe Winter Storms
- Wildfire/ Brush Fire- changed to Wildfires
- Tropical Storms and Tropical Cyclones- changed to Hurricanes/Tropical Storms
- Dam Failure- changed to Dam/Levee Failure
- Seismic/Earthquake- changed to Earthquakes
- Floods (Riverine and Shallow)- changed to Floods

Hazards Omitted from the Plan

Coastal Erosion- Coastal erosion is natural hazard profiled within the TDEM State Hazard Mitigation Plan. The closest coastline to jurisdictional boundaries for Hays County is over 120 miles away. The lack of proximity to a coastline results in no risk from this hazard for Hays County and participating jurisdictions; therefore, Hays County did not add Coastal Erosion to their plan.

Land Subsidence- Although land subsidence is a naturally occurring hazard also profiled within the TDEM State HMP, there were no reported historical occurrences within the planning area. Due to negligible risk, land subsidence was not profiled as part of this HMP Update.

Hazard Profiles

The following sections outline descriptions and extent scales that apply for all participating communities for each hazard profiled within this 2018 HMP Update. Hazard profiles utilizing solely county-level data for regional hazards are addressed in this chapter. All others are discussed within the individual jurisdiction annexes.

Within this Chapter, reference to Hays County within the HMP Update is meant to address the unincorporated portion of the planning area.



Drought

Drought: Description

According to the 2013 State of Texas Hazard Mitigation Plan Update, drought is defined as the consequence of a natural reduction in the amount of precipitation expected over an extended period of time, usually a season or more in length.

Drought: Extent Scale

Table 2.2, Drought Intensity Index

Category	Description	Possible Impacts
D0	Abnormally Dry	<i>Going into drought:</i> <ul style="list-style-type: none"> • short-term dryness slowing planting, growth of crops or pastures <i>Coming out of drought:</i> <ul style="list-style-type: none"> • some lingering water deficits • pastures or crops not fully recovered
D1	Moderate Drought	<ul style="list-style-type: none"> • Some damage to crops, pastures • Streams, reservoirs, or wells low, some water shortages developing or imminent • Voluntary water-use restrictions requested
D2	Severe Drought	<ul style="list-style-type: none"> • Crop or pasture losses likely • Water shortages common • Water restrictions imposed
D3	Extreme Drought	<ul style="list-style-type: none"> • Major crop/pasture losses • Widespread water shortages or restrictions
D4	Exceptional Drought	<ul style="list-style-type: none"> • Exceptional and widespread crop/pasture losses • Shortages of water in reservoirs, streams, and wells creating water emergencies

(US Drought Monitor, 2016)

Drought: Location

Drought occurs on a regional scale. The entire planning area is equally at risk as it can occur anywhere within the participating communities.

Drought: Previous Occurrences

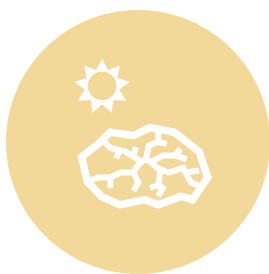
NOAA Storm Events Database documents 27 drought events for Hays County since the year 1996. Although there were no drought events reported specifically for individual incorporated jurisdictions within the County, all participating communities would have been affected by the events that were reported for the surrounding County area.

Drought: Extent and Probability

The US Drought Monitor Drought Intensity scale classifies drought by 5 categories shown in Table 2.2, D0 through D4. According to the reported drought occurrences, the maximum drought extent experienced is a Category D4 drought.

Based on 6 years with reported drought events from the NOAA Storm Events Database within 20 years, a drought event occurs approximately once every 3 years on average in Hays County. All participating communities are assumed to experience drought reported for the surrounding County areas, and therefore can expect a drought event approximately once every 3 years on average, up to a Stage D4.





Drought: Impact

Impacts reported at the County level are applicable in illustrating impact to the entire planning area. As indicated by Table 2.3, multiple assets are impacted during a drought event. The highest reported impact is water supply and quality for residents being impacted by low availability, resulting in the need for restrictions. As a cascading impact, low water levels affect water pressure needed for firefighting in residential and brush fire situations. Agricultural resources are also strained as water is critical to operations for farmers and ranchers who tend to their crops and animals. Other assets impacted include the effect on water-dependent businesses losing revenue, and interruptions or shortages for water-dependent energy generation. Dying plants and wildlife, and impacts to society are also experienced during a drought. In addition, low river levels deter tourists from visiting the County and the Cities along the rivers, impacting tourism and recreation revenue.

Table 2.3, Reported Drought Impacts, Hays County

Hays County Drought Impacts 1996-2016	
Category	# of Incidents Reported
Agriculture	45
Business & Industry	3
Energy	2
Fire	24
Plants & Wildlife	33
Relief, Response & Restrictions	48
Society & Public Health	7
Tourism & Recreation	3
Water Supply & Quality	53

(University of Nebraska-Lincoln, 2016)





Table 2.4, Planning Area Drought Vulnerability Summaries

Community Drought Vulnerability Summaries	
Village of Bear Creek	Bear Creek residents depend on multiple sources for their water supply. Some residents use public water through the West Travis County Public Utility Agency. Others use rainwater harvesting and private wells. Well-monitoring data from private wells (Village of Bear Creek, 2013) shows that there have been occasions during which water levels have neared depletion. A drought event would negatively impact those who use rainwater, as they would need to seek water from a third party for drinking, hygiene and household needs. As the community is 100% residential, there are no economic outlets that depend on water for income. A cascading vulnerability would be the increased risk of wildfire spread that could occur low water levels impact water pressure for fighting fires.
City of Buda	Among communities in Texas that have a population over 10,000, Buda is considered one of the fastest growing populations in the State of Texas. Additional wells are being dug in order to meet the demand of the growth in the City. Water shortages are a concern and water availability for all citizens within the jurisdiction could be impacted during a drought, as some of the City's water supply is composed of surface water. This could also affect fire response as it could result in lowered pressure for hydrants. Water conservation education programs could help encourage the public to be a part of the solution.
City of Hays	<p>The City of Hays utilizes water services that draw from the Edwards Aquifer. In the past, there have been periods when the Edwards Water District has had to issue water usage guidance due to low water levels.</p> <p>It is estimated that 2 to 3 residents have private wells. The community is directly impacted during periods of low levels for the aquifer.</p> <p>Hays has fire hydrants in the community that could experience periods of low pressure in the event of water shortage. This could impact the ability of firefighters to suppress a fire in the community.</p>
City of Dripping Springs	<p>The majority of the City of Dripping Springs uses the Dripping Springs Water Supply Corporation as its source of water, which has 4 wells in the area. Most residents in Eastern Dripping Springs receive their water from the West Travis County Utility District. The utility district utilizes water from the Lower Colorado River Authority.</p> <p>The wells have been consistent with water availability and maintain good water pressure. Drought is a concern but not a predominant 1 for Dripping Springs. A significant drought (Category D5) could put a strain on wells that had not previously experienced shortages.</p>
Hays County	<p>The impacts of a drought on the community would clearly affect water supply, as parts of the County utilize water from the Edwards and Trinity aquifers. The County is currently in the process of obtaining remote weather stations to monitor drought indexes.</p> <p>When droughts affect Hays County, revenue from Jacob's Well can be affected due to the reliance of water flow for the park. There is also revenue from tourism into the County to visit the Blanco River. This also suffers during periods of drought.</p>



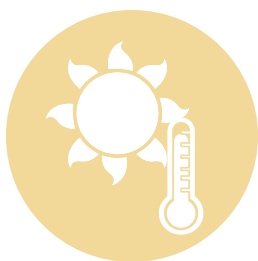
Table 2.4, Planning Area Drought Vulnerability Summaries

Community Drought Vulnerability Summaries	
City of Kyle	With rapid growth and development occurring in Kyle at an unprecedented rate, the importance of the availability of water in Kyle is significant. The effects and impacts of an exceptional drought would only worsen water supply and quality. The City has several Capital Improvement Projects focused on creating back-up water supplies and improving water lines. In addition, stormwater and wastewater plans activities are in place to further help with the situation. Until some of these projects are completed and the solutions are in place, vulnerability exists for water supply for residents and businesses. The community is taking active measures to lessen vulnerability by participating in the Hays Caldwell Public Utility Agency that serves to preserve the long-term water needs of its members.
Mountain City	Although the community is at risk for drought, along with the rest of the Hays County area, Mountain City has taken measures to lessen their risk for water shortage through an inter-local agreement for Emergency Water Service with the Hays Consolidated Independent School District. This agreement allows the 2 water systems to interconnect in order to serve as back-up for each other. In the event of a regional drought, however, both sources would be equally at risk for water shortage. The community is currently in the process of completing the purchase of their water system. Once the purchase is complete, Mountain City can begin to enforce conservation practices and measures during periods of high risk.
City of Niederwald	The City of Niederwald uses the Goforth Special Utility District for water services. The source has proven to be resilient, with little detectable impact during the drought periods occurring from 2011 to 2013. Although the community has not experienced past water availability issues associated with drought, they could experience some degree of water supply impact for residents and businesses during an exceptional drought event. With Niederwald farmers and ranchers depending on the water supply for their livelihood, a severe drought would negatively impact their profitability.
City of San Marcos	<p>There are wells and pumps in the City that provide the water supply, and those are vulnerable to drought. The City has a backup contract with Canyon Lake for emergency water situations, to lessen the impact of water shortage.</p> <p>River levels directly impact the tourism activity of the City. When drought periods are occurring, low water levels inhibit the ability for tourists to float down the river. A decrease in visitors directly impacts tax revenue from the sales that typically come in during those seasons for tubing vendors and also other economic outlets throughout the area.</p> <p>There is a power generation plant dependent on water in the City. Effluent water that has been through wastewater treatment is sold to the electrical generation plants for the purposes of cooling their engines.</p> <p>Another vulnerability is the impact of drought on the small amount of farmland within the City limits. Periods of drought in San Marcos can lead to cascading disaster scenarios such as wildfire due to the increase in dried vegetation that can in turn increase wildfire risk.</p>



Table 2.4, Planning Area Drought Vulnerability Summaries

Community Drought Vulnerability Summaries	
City of Uhland	The community uses water that is sourced by the Lower Colorado River Authority and is vulnerable to the effects of drought impacting the citizens of Uhland by decreasing their water supply. In addition, the community is growing exponentially and the construction of new subdivisions within the City limits and extraterritorial jurisdiction (ETJ) will further strain water resources.
City of Wimberley	The City's water is supplied by Wimberley Water Supply Corporation whose source is the groundwater within the Hays Trinity Groundwater Conservation District. With no alternate established water source, water shortage due to an extreme drought event is a concern. A drought could result in insufficient recharge to the aquifer resulting in groundwater level decline, known as drawdown. Insufficient water supply could also affect the ability to fight fires leaving the entire community at additional risk. There are hydrants within Wimberley that are connected to waterlines that may be improperly sized, affecting their ability to effectively pump the water needed to respond to a fire.
City of Woodcreek	Aqua Texas is Woodcreek's primary water source, with no present backup services for potable water. Camp Young Judaea uses rainwater collection for their landscape irrigation while the community golf course utilizes gray water for irrigation. These practices lessen the demand on potable water, however, an exceptional drought could even impact availability of gray water. City residents and businesses not only rely on water for personal use, but also depend on its availability for the recreational sites that produce revenue for the community.



Extreme Heat

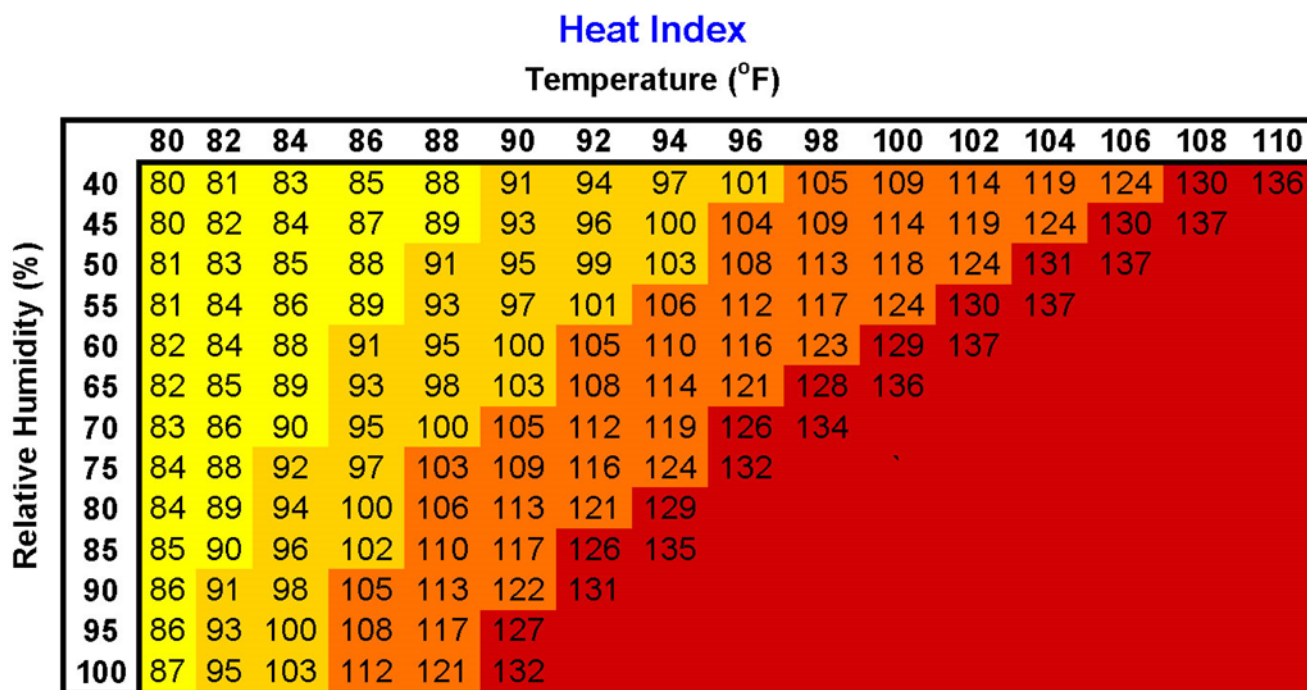
Extreme Heat: Description

According to the 2013 State of Texas Hazard Mitigation Plan Update, extreme heat is defined as a combination of very high temperatures and, usually, exceptionally humid conditions. When persisting over a period of time, it is called a heat wave.

Extreme Heat: Extent Scale

Figure 2.1 illustrates NOAA's National Weather Service (NWS) Heat Index commonly used to provide information on perceived heat and dangers of exposure considering the relationship between air temperature and relative humidity. The heat index value can be increased by up to 15°F if exposed to direct sunlight as the index was created for shady locations.

Figure 2.1, NOAA's NWS Heat Index



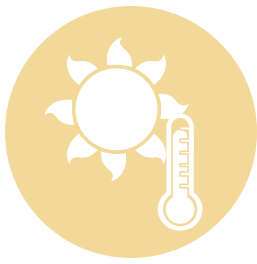
Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution
 Extreme Caution
 Danger
 Extreme Danger

Classification	Heat Index	Effect on the body
Caution	80°F - 90°F	Fatigue possible with prolonged exposure and/or physical activity
Extreme Caution	90°F - 103°F	Heat stroke, heat cramps, or heat exhaustion possible with prolonged exposure and/or physical activity
Danger	103°F - 124°F	Heat cramps or heat exhaustion likely, and heat stroke possible with prolonged exposure and/or physical activity
Extreme Danger	125°F or higher	Heat stroke highly likely

(NOAA/NWS, 2017)





Extreme Heat: Location

Extreme heat occurs on a regional scale; the entire planning area is equally at risk as it can occur anywhere within the participating communities.

Extreme Heat: Previous Occurrences

NOAA's Online Weather Data (NOWData) provides temperature data ranging from the year 2000 to 2016. NOAA's National Weather Service (NWS) Heat Index shown in Figure 2.1 indicates that temperatures meeting or exceeding 90°F are designated with an "Extreme Caution" or greater warning classification. Extreme heat for the planning area is considered temperatures ranging from 90°F and above.

According to Canyon Dam Station, the local weather data collection center with comprehensive data within the planning area, the mean number of days with a daily max temperature equal or greater to 90°F is 94 days. Currently, the greatest number of days during which the planning area experienced extreme heat is 119 in 2008 while the highest temperature experienced was 109°F in August 2011 (a "Danger" NWS Heat Index classification). Due to the regional nature of extreme heat occurrence, Canyon Dam Station records apply equally to all participating communities.

Extreme Heat: Extent and Probability

The extent of extreme heat that the planning area has experienced can be derived from the data provided from NOWData at Canyon Dam Station since the year 2000. The highest daily mean temperature experienced was 109°F in August 2011. This event is classified by the NWS Heat Index as "Danger".

The probability of future events can be determined by assessing historical averages. Since extreme heat events occur on a regional scale, all participating communities' future probability is assumed to be similar to the area surrounding Canyon Dam Station. Based on NOWData, the planning area can expect, on average, approximately 94 days a year with temperatures equal or greater to 90°F, and up to 109°F, a "Danger" warning classification per the NOAA NWS Heat Index. As extreme heat events have occurred every year since 2000, the probability of extreme heat affecting the planning area is 100% in any given year.

Extreme Heat: Impact

Extreme heat has physical impacts on the public and the infrastructure that supports them. According to the Texas Health Care Information Collection and Trauma Registry from the Texas Department of State Health Services' Injury Epidemiology & Surveillance Branch, the following number of patients were received in Hays County medical facilities for Heat Related Injuries and Trauma (shown in Tables 2.5 and 2.6).

Table 2.5, Hays County Hospital Inpatient Data, Extreme Heat

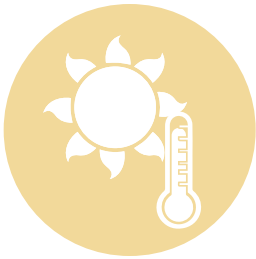
Description	2010	2011	2012	2013	2014
Accident caused by excessive heat due to weather conditions	1	3	5	0	0
Accident due to excessive heat of unspecified origin	1	0	0	0	0

(Texas Department of State Health Services- Injury Epidemiology & Surveillance Branch, 2017)

Table 2.6, Hays County Trauma Data, Extreme Heat

Description	2010	2011	2012	2013	2014
Accident due to excessive heat of unspecified origin	0	1	0	0	0

(Texas Department of State Health Services- Injury Epidemiology & Surveillance Branch, 2017)



In addition to the physical impacts, an excessive heat event can also be the cause of cascading incidents. Electrical outages could occur due to the high demands of electricity needed to power cooling systems. A loss of critical resources, such as power, has significant impact on the entire population, with higher impacts to those with vulnerabilities to such conditions.

Table 2.7 shows the portions of each participating community's population, according to HAZUS-MH 3.2 updated Census 2010 population estimates, that would be greatly impacted by the severe temperatures related to excessive heat and/or the loss of electrical energy in their dwellings.

Table 2.7, Community Vulnerable Populations

Jurisdiction	Population over 65	Population under 16	Economically Disadvantaged Population (\$0 - \$20k)
Village of Bear Creek	25	95	2
City of Buda	527	2,414	284
City of Hays	36	37	3
City of Dripping Springs	262	584	41
Hays County	6,784	18,469	2,352
City of Kyle	1,261	9,644	635
Mountain City	55	130	0
City of Niederwald	36	110	32
City of San Marcos	3,013	6,406	6,292
City of Uhland	30	155	17
City of Wimberley	703	444	164
City of Woodcreek	549	243	102





Table 2.8, Planning Area Extreme Heat Vulnerability Summaries

Community Extreme Heat Vulnerability Summaries	
Village of Bear Creek	The 122 residents classified as “Community Vulnerable Populations” (see Table 2.7) would be impacted financially by long periods of extreme heat that can result in higher energy bills and also create physiological impacts when cooling is not available. Bear Creek does not have a formal cooling station plan for the community and does not have the public facilities with which to cool people. Agreements would have to be achieved with outside agencies, non-profits or private interest groups.
City of Buda	All citizens that reside within the Buda city limits are vulnerable to extreme heat, as are all of the citizens that reside there, however the 3225 residents regarded as “Community Vulnerable Populations” (see Table 2.7) would be impacted financially by long periods of extreme heat that can result in higher energy bills and also create physiological impacts when cooling is not available. Buda does not have a cooling station plan for the community but does have locations available in order to cool people. An existing strategy for helping the public with extreme heat events is a fan donation program done by the fire department. This could be enhanced upon by adding additional public benefits and services.
City of Hays	The City of Hays does not have a cooling station plan for the community but could use their City Hall as a location to provide a cool place for vulnerable residents. City Hall has no generator back-up for electricity, so they cannot provide cooling if an electrical outage occurs. There are 76 members of the community that are classified as “Community Vulnerable Populations” (see Table 2.7) who would be directly impacted by long periods of extreme heat.
City of Dripping Springs	There are 887 residents classified as part of “Community Vulnerable Populations” within the City (see Table 2.7). Dripping Springs does not have a cooling station plan for the community but does have locations available in order to do so, such as school buildings and Central Fire Station. These structures have backup generator power that would be used in the event that power is disrupted. City Hall is an additional option for a cooling center location, however it does not have a backup generator.
Hays County	Hays County does not have a cooling station plan for the community but does have locations available in order to cool people. The available public facilities, however, lack generator back-up capabilities to continue to offer cooling in the event of a power outage. There are 27,605 people within the County’s “Community Vulnerable Populations” count (see Table 2.7). There would be difficulty in accommodating even a percentage of that number of elderly, young and economically disadvantaged people.
City of Kyle	Kyle does not have a cooling station plan for the community but does have locations available in order to cool people. Locations within the City where the public could seek shelter during heat events do not have back-up generator power. There are 11,540 residents with the City’s “Community Vulnerable Populations” (see Table 2.7) who would face financial and possibly physiological impacts from long periods of extreme heat.
Mountain City	Mountain City does not have a cooling station plan for the community. They have 1 public building that serves as City Hall, however it does not have generator back-up to provide a cool place in the case of a power outage during Extreme Heat events. The City has a total of 185 residents within the “Community Vulnerable Populations” (see Table 2.7) that would face increased impacts as the result of an extended period of extreme heat.



Table 2.8, Planning Area Extreme Heat Vulnerability Summaries

Community Extreme Heat Vulnerability Summaries	
City of Niederwald	Niederwald does not have a formal cooling station plan for the community but could possibly utilize City Hall in order to cool people. A drawback to the use of City Hall is the lack of generator back-up to provide cooling if there is an electrical outage. A partnership could be pursued with Hays CISD for use of the elementary school within the City limits. In the event of disaster-level extreme heat that could impact the 176 residents classified within the “Community Vulnerable Populations” (see table 2.7).
City of San Marcos	<p>San Marcos does not have a cooling station plan for the community but does have locations available in order to cool people. They have also held fan drives that provide box fans to the senior adult population in need. This project is a volunteer-run effort that utilizes some of the emergency services district stations as donation drop-off points.</p> <p>There are 15,711 residents classified within the “Community Vulnerable Populations” (see Table 2.7) in San Marcos. These members of the community are financially impacted by the increased cost of energy for cooling homes during long periods of extreme heat and can also be impacted. In addition, San Marcos has a small homeless population that sleep outside, under bridges, and in parks and wooded areas. This population would be especially impacted by the dangerous temperatures of extreme heat events.</p>
City of Umland	Umland does not have a cooling station plan for the community but does have locations available, such as City Hall and the Umland Community Center in order to implement one in the future. The structures do not have back-up generator power to continue providing cooling if electrical services are interrupted by the strain of Extreme Heat. In addition, there are 4 churches in the community that could possibly coordinate to provide emergency cooling stations for the residents, especially the 202 residents classified as “Community Vulnerable Populations” (see Table 2.7).
City of Wimberley	There are 1311 residents classified as part of the “Community Vulnerable Populations” (see Table 2.7). Wimberley currently has emergency shelter plans for cooling stations, however if these shelters are without an alternate power source, the local government would be unable to provide cool air in the event of an outage. The community center is in need of a generator as it could provide shelter for many of the community members without access to air conditioning. According to community testimony, some schools may need generators as well. Twin Mountain Manor provides low income housing to seniors and has issues with residents not having access to air conditioning during the summer months. Additionally, tourists that attend Wimberley’s Market Days and parks are sometimes victims of Extreme Heat.
City of Woodcreek	Woodcreek does not have a cooling station plan for the community. There is a City Hall facility available which could be used as part of a future cooling station plan. City Hall does not currently have a backup generator. This could lead to difficulty in providing assistance to any of the 894 residents classified as part of the “Community Vulnerable Populations” (see Table 2.7) who may need refuge during a prolonged extreme heat event.



Severe Winter Storms

Severe Winter Storms: Description

According to the 2013 State of Texas Hazard Mitigation Plan Update, a severe winter storm is defined as extreme cold and heavy concentrations of snowfall or ice.

Severe Winter Storms: Extent Scale

The extent of Winter Storms can be measured by snowfall and ice accumulation via the SPIA and RSI Index. The Sperry-Piltz Ice Accumulation Index, or SPIA Index, is an ice accumulation and damage prediction index that uses an algorithm of researched parameters that, when combined with National Weather Service forecast data, predicts the projected footprint, total ice accumulation, and resulting potential damage from approaching ice storms. It is a tool to be used by the NWS, FEMA, as well as other agencies and communities for risk management and winter weather preparedness. The SPIA Index is listed below in Figure 2.2. The SPIA Index's Index range from 0 (lowest) – 5 (most extreme event).

Figure 2.2, Sperry-Piltz Ice Accumulation (SPIA) Index

The Sperry-Piltz Ice Accumulation Index, or “SPIA Index” – Copyright, February, 2009

ICE DAMAGE INDEX	* AVERAGE NWS ICE AMOUNT (in inches) <small>*Revised-October, 2011</small>	WIND (mph)	DAMAGE AND IMPACT DESCRIPTIONS
0	< 0.25	< 15	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages.
1	0.10 – 0.25	15 - 25	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
	0.25 – 0.50	> 15	
2	0.10 – 0.25	25 - 35	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
	0.25 – 0.50	15 - 25	
	0.50 – 0.75	< 15	
3	0.10 – 0.25	> = 35	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1 – 5 days.
	0.25 – 0.50	25 - 35	
	0.50 – 0.75	15 - 25	
	0.75 – 1.00	< 15	
4	0.25 – 0.50	> = 35	Prolonged & widespread utility interruptions with extensive damage to main distribution feeder lines & some high voltage transmission lines/structures. Outages lasting 5 – 10 days.
	0.50 – 0.75	25 - 35	
	0.75 – 1.00	15 - 25	
	1.00 – 1.50	< 15	
5	0.50 – 0.75	> = 35	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.
	0.75 – 1.00	> = 25	
	1.00 – 1.50	> = 15	
	> 1.50	Any	

(Categories of damage are based upon combinations of precipitation totals, temperatures and wind speeds/directions.)

(Sperry, 2017)



NOAA's National Centers for Environmental Information developed The Regional Snowfall Index (RSI) used to assess the societal impact of winter storms. RSI, located in Table 2.9, is calculated considering the spatial extent of the storm, quantity of snowfall, and the incorporation of these with population.

Table 2.9, Regional Snowfall Index (RSI)

Category	RSI Value	Description	Snowfall Threshold (in.)
1	1-3	Notable	2"
2	3-6	Significant	5"
3	6-10	Major	10"
4	10-18	Crippling	15"
5	18.0+	Extreme	>15"

Severe Winter Storms: Location

Severe winter storms occur on a regional scale; therefore, all of the planning area is equally at risk.

Severe Winter Storms: Previous Occurrences

NOAA Storm Events Database documents 13 winter storm events for Hays County since the year 1996 (see Table 2.10). Although there were no winter storm events reported specifically for individual participating jurisdictions, the entire planning area would have been affected by the events that were reported for the surrounding County area.

Fatality, injury and damage amounts are shown in XX, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table 2.10, Winter Weather Occurrences, Hays County

Location	Date	Type	Fatalities	Injuries	Property Damage	Crop Damage
HAYS (ZONE)	2/1/1996	Winter Storm	0	0	0.00	0.00
HAYS (ZONE)	1/7/1997	Winter Storm	0	0	0.00	0.00
HAYS (ZONE)	1/11/1997	Winter Storm	0	0	0.00	0.00
HAYS (ZONE)	12/23/1998	Winter Storm	0	0	0.00	0.00
HAYS (ZONE)	12/12/2000	Winter Storm	0	0	0.00	0.00
HAYS (ZONE)	11/28/2001	Winter Storm	0	0	0.00	0.00
HAYS (ZONE)	2/24/2003	Winter Storm	0	0	0.00	0.00
HAYS (ZONE)	12/7/2005	Winter Storm	0	0	0.00	0.00
HAYS (ZONE)	1/15/2007	Winter Storm	0	0	125,000.00	0.00
HAYS (ZONE)	2/3/2011	Winter Storm	0	0	0.00	0.00
HAYS (ZONE)	11/26/2013	Winter Weather	0	0	0.00	0.00
HAYS (ZONE)	1/23/2015	Winter Weather	0	0	0.00	0.00
HAYS (ZONE)	2/16/2015	Winter Weather	0	0	0.00	0.00
Total			0	0	\$125,000.00	\$0.00

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)





Severe Winter Storms: Extent and Probability

According to the reported previous winter weather occurrences, the maximum winter weather extent experienced was a RSI Category 1 snowfall event and a SPIA Ice Index Category 2 ice event. Based on 13 reported events from the NOAA Storm Events Database in 20 years, a winter weather event occurs approximately every 2 years on average in Hays County. Since these events can happen anywhere throughout the HMP update area and occur on a regional scale, the entire planning area's probability is assumed to be similar to the surrounding County area and can expect a winter weather event approximately once every 2 years on average in the future with up to an RSI Category 1 snowfall event or SPIA Ice Index Category 2 ice event.

Severe Winter Storms: Impact

Severe winter weather has physical impacts upon the public and the infrastructure that supports them. According to the Texas Health Care Information Collection and Trauma Registry from the Texas Department of State Health Services' Injury Epidemiology & Surveillance Branch, the following number of patients were received in Hays County medical facilities for Cold Related Injuries and Trauma (shown in Tables 2.11 and 2.12).

Table 2.11, Hays County Hospital Inpatient Data, Severe Winter Storms

Description	2010	2011	2012	2013	2014
Accident caused by excessive cold due to weather conditions	2	0	0	0	0
Accident due to excessive cold of unspecified origin	1	0	0	0	1

(Texas Department of State Health Services- Injury Epidemiology & Surveillance Branch, 2017)

Table 2.12, Hays County Trauma Data, Severe Winter Storms

Description	2010	2011	2012	2013	2014
Accident due to excessive cold due to weather conditions	1	0	0	0	0

(Texas Department of State Health Services- Injury Epidemiology & Surveillance Branch, 2017)

Severe Winter Storms: Vulnerability Summary

Table 2.13 shows the portions of each participating community's population, according to HAZUS-MH 3.2 updated Census 2010 population estimates, that would be greatly impacted by the extreme temperature conditions related to severe winter storms and/or the loss of electrical energy in their dwellings.

Table 2.13, Community Vulnerable Populations

Jurisdiction	Population over 65	Population under 16	Economically Disadvantaged Population (\$0 - \$20k)
Village of Bear Creek	25	95	2
City of Buda	527	2,414	284
City of Hays	36	37	3

**Table 2.13, Community Vulnerable Populations**

Jurisdiction	Population over 65	Population under 16	Economically Disadvantaged Population (\$0 - \$20k)
City of Dripping Springs	262	584	41
Hays County	6,784	18,469	2,352
City of Kyle	1,261	9,644	635
Mountain City	55	130	0
City of Niederwald	36	110	32
City of San Marcos	3,013	6,406	6,292
City of Uhland	30	155	17
City of Wimberley	703	444	164
City of Woodcreek	549	243	102

Table 2.14, Planning Area Severe Winter Storms Vulnerability Summaries

Community Severe Winter Storms Vulnerability Summaries	
Village of Bear Creek	<p>Although the occurrence and intensity of severe winter storms do not pose a serious risk, the fact that 100% of the roads in Bear Creek are owned by the Village means that County or State assets are not always readily available for sanding the roads in the event of winter storms. In addition, the abundance of trees on the lots, along with all the overhead electrical utilities increase the risk of power outages from branches falling on power lines. Although prolonged outages have not been an issue in the past, it is unknown if icy roads could impact the ability of Pedernales Electric Cooperative from being able to respond to a power outage in the community. It is unknown how many private residents have emergency generator power.</p>
City of Buda	<p>The majority of surface power lines in Buda pose a vulnerability due to the impact on homes and businesses during cold temperatures, when an accumulation of ice and snow on branches could cause them to fall on surface lines.</p> <p>The bridges in Buda are owned by TxDOT and the State handles sanding efforts during ice events. They are normally prompt in sanding efforts, however there are Alzheimer clinics and nursing homes located near these bridges and accessing these locations during severe winter weather could pose a challenge for first responders.</p> <p>The community has a turf spreader that could be used for sanding efforts, but no staff are dedicated for spreading sand. Additionally, there is a senior van owned by the City that shuttles elderly residents to different locations and cannot operate during winter events.</p>



Table 2.14, Planning Area Severe Winter Storms Vulnerability Summaries

Community Severe Winter Storms Vulnerability Summaries	
City of Hays	A majority of the City of Hays' power lines are on poles. During extreme winter weather, an accumulation of ice and snow on branches could result in them falling upon exposed lines. The resulting impact on electricity to homes and businesses during cold temperatures would pose vulnerability to the 198 residents who would then be unable to obtain heat.
City of Dripping Springs	<p>Dripping Springs has 100% surface power lines, outside of brand new subdivisions. This poses a vulnerability to homes and business during cold temperatures when an accumulation of ice and snow on branches could fall on power lines. According to community testimony, there was a winter storm in the 1990's that resulted in a power outage that left residents without power for 4 days.</p> <p>There are no sand spreaders or systems for ice-removal or prevention. No City-owned streets department or vehicles are designated to help with these efforts. If significant sanding was needed, it would be contracted.</p>
Hays County	<p>Hays County's has a large number of surface power lines. These power lines pose a vulnerability due to the impact on electricity to homes and businesses during cold temperatures when an accumulation of ice and snow on branches could cause them to fall on the exposed power lines.</p> <p>The County has the ability to spread sand and can also contract with the Texas Department of Transportation in the event that additional resources are needed. Even though Sanding capabilities exist, the low water crossings (262 low water crossings as of 2013, according to the TNRIS) and bridges in the area affect response times for emergency vehicles in the planning area.</p>
City of Kyle	<p>Outside of newly developed subdivisions, Kyle has mostly surface power lines. Surface power lines pose a vulnerability due to the impact on electricity to homes and businesses during cold temperatures, when an accumulation of ice and snow on branches or the lines themselves could cause lines to collapse and interrupt service.</p> <p>The community has a sand spreader that could be used to begin Sanding operations, that would be supplemented by those done by the County and State for roads that they maintain. Elderly members of the community may be impacted if they are serviced by the Meals on Wheels program that is run within the City. The delivery of the food becomes a high priority as it may be the primary source for the recipients' evening nutrition.</p>
Mountain City	<p>Mountain City has many surface power lines. This poses a vulnerability due to the impact on electricity to homes and businesses during cold temperatures when an accumulation of ice and snow on branches could cause them to fall on the exposed power lines.</p> <p>Mountain City is comprised of residential streets maintained by the City, with no capabilities for de-icing. There are 2 entrances to the community, Pin Oak and Mountain City Drive. If these streets are iced over, there is no ingress or egress for the community. Although there are no bridges, steep hills or low water crossings, this lack of connectivity to outside roads lends to vulnerability.</p>

Table 2.14, Planning Area Severe Winter Storms Vulnerability Summaries

Community Severe Winter Storms Vulnerability Summaries	
City of Niederwald	<p>A majority of Niederwald's power lines are on poles, this poses a vulnerability due to the impact on electricity to homes and businesses during cold temperatures when an accumulation of ice and snow on lines could cause them to be weighed down and damaged.</p> <p>Although there are only 2 city streets that are under the responsibility of Niederwald for maintenance and care, the community does not currently have the resources to ensure the removal of ice from roads in the event of an exceptional severe winter storm. (Between 2017 and 2018, the City will have an additional 6-7 roads.) There is a dependence on the ability to travel over a bridge on State Highway 21 in order to reach hospitals or emergency services.</p>
City of San Marcos	<p>About half of San Marcos' power lines are on poles. This poses a vulnerability due to the impact on electricity to homes and businesses during cold temperatures when an accumulation of ice and snow on branches could cause them to fall on the exposed power lines.</p> <p>Dangerous road conditions pose a threat to San Marcos due to the large number of residents and student populations that drive into the City for classes at Texas State University. The City has a dump truck that is used to drop sand onto the streets, however community officials note that this is not the most effective method for spreading sand for icy roads. School buses often have problems during icy conditions in San Marcos, as well. There are some significant roadways that have alternate routes, but the major thoroughfares for the community are Wonder World Drive, Aquarena Springs and IH-35. All State and Federal roadways are maintained by other entities and outside of the control of the City.</p>
City of Uhland	<p>A majority of Uhland's power lines are on poles. This poses a vulnerability due to the impact on electricity to homes and businesses during cold temperatures when an accumulation of ice and snow on branches could cause them to fall upon the exposed power lines. An abundance of dead trees in some areas could create a greater risk. The Plum Creek bridge is vulnerable to ice and is a bridge maintained by another entity. An indirect measure that recently took place in the community that will lessen vulnerability was a recent reduction of the speed limit through the portion of State Highway 21 that runs through the Uhland City limits. This should lessen the number of overall collisions and indirectly decrease the number of accidents occurring during ice and sleet events.</p>





Table 2.14, Planning Area Severe Winter Storms Vulnerability Summaries

Community Severe Winter Storms Vulnerability Summaries	
City of Wimberley	<p>A majority of Wimberley's power lines are on poles. This poses a vulnerability due to the impact on electricity to homes and business during cold temperatures when an accumulation of ice and snow on branches could cause them to fall on the exposed power lines. The electrical system does not promote redundancy so the risk for power outages is significant. The transmission line is extremely old and has limited capacity which can lead to extended outage where residents could have difficulty staying warm.</p> <p>The City has limited capabilities to respond to transportation issues in the event of a severe winter weather event. Currently, there is an inter-local agreement with Hays County, as well as a private contract for sand spreading in the event of icy roads. However, there are many elevated bridges, as well as ingress and egress points to neighborhoods that are low water crossings. These crossings can become frozen over and could cause issues with first responders reaching distress calls. Ranch Road 12 is a main artery for residents, as well as emergency responders, as it gives the fastest access to Hospital. In the past, it has been necessary to stage medical assets in advance due to its inaccessibility during a winter weather event. Additionally, the City has many hilly areas that create inaccessible areas due to the risk associated with grade and ice.</p>
City of Woodcreek	<p>Woodcreek's entire electrical distribution system is subsurface, which eliminates a vulnerability to power lines experiencing impact from falling branches or the weight of ice and snow. The most substantial vulnerability to Woodcreek is the presence of low water crossings at each of the major roads that serve as access points to the community. Brookmeadow, Brookhollow and Woodcreek Drive all cross Hog Creek. These crossings are critical to emergency responder ingress and egress for the community and would be affected greatly by icy conditions. Although there is an alternate entrance (a back gate at the edge of town) that provides an alternate route, this alternate entrance has 2 low water crossings across 2 other creeks. Road hazards not only put citizens at risk, but also endanger the lives of first responders.</p>



Lightning

Lightning: Description

According to the 2013 State of Texas Hazard Mitigation Plan Update, lightning is a massive electrostatic discharge between electrically charged regions within clouds, or between a cloud and the Earth's surface.

Lightning: Extent Scale

The magnitude of a lightning event can be measured in terms of how many strikes occur within a given time interval. As seen in Table 2.15.

Table 2.15, Lightning Activity Level (LAL) Grids

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 (a mass of streaks of rain appearing to hang under a cloud and evaporating before reaching the ground), but light rain will occasionally reach the ground. Lightning is very infrequent.	1-8
3	Towering cumulus covers less than two-tenths of the sky. Thunderstorms are few, but two to three must occur within the observation area. Light to moderate rain will reach the ground, and lightning is infrequent.	9-15
4	Towering cumulus covers two to three-tenths of the sky. Thunderstorms are scattered and more than three must occur within the observation area. Moderate rain is common and lightning is frequent.	16-25
5	Towering cumulus and thunderstorms are numerous. They cover more than three-tenths and occasionally obscure the sky. Rain is moderate to heavy and lightning is frequent and intense.	>25
6	Similar to LAL 3 except thunderstorms are dry.	

(NOAA, 2017)

Lightning: Location

The entire HMP Update area is exposed to some degree of lightning hazard, though exposed points of high elevation have a significantly higher frequency of occurrence. Since lightning can occur at any location, lightning events could be experienced anywhere within the planning area.

Lightning: Previous Occurrences

NOAA's Severe Weather Data Inventory (SWDI) provides the ability to search through National Climatic Data Center (NCDC) archives for data on a county level. SWDI provided historical lightning counts for Hays County from 1986 through 2013. These counts are archived per day. Over the time period, there were 1,667 days with at least one lightning strike in the County (National Climatic Data Center, 2017).

Lightning: Extent and Probability

As SWDI lightning data is only available on counts per day, extent cannot be determined using LAL Grid classifications as they are determined according to strikes per 15 minute interval. However, the data available did provide the maximum number of strikes within a day of 3,076. Based on the 10,007 days of data presented in the reporting period from 1986 to 2013, there were 1,667 days with at least one lightning event with the County (16.6% of the total days). Those event days resulted in an average of 105 strikes per day with a maximum strike of count of 3,076 in one day.





The planning area can expect a lightning event once every 6 days in the future with up to a maximum of 3,076 strikes in one day. Since these events can happen anywhere throughout the HMP update area, the entire planning area's probability is assumed to be similar to the surrounding County area.

Lightning: Impact

The National Lightning Detection Network (NLDN) reported 217 lightning fatalities within the State between the years 1959 and 2013. According to the Texas Health Care Information Collection and Trauma Registry from the Texas Department of State Health Services' Injury Epidemiology & Surveillance Branch, the following number of patients were received in Hays County medical facilities for Lightning Related Trauma (see Table 2.16).

Table 2.16, Hays County Trauma Registry Data, Lightning Events

Description	2010	2011	2012	2013	2014
Accidents due to lightning	0	1	0	0	1

(Texas Department of State Health Services- Injury Epidemiology & Surveillance Branch, 2017)

In addition to the physical impacts, a lightning event can also be the cause of cascading incidents. Electrical outages could occur due to the impact that lightning strikes can have on electrical utility infrastructure. A loss of critical resources, such as power, has significant impact on the entire population, with higher impacts to those with vulnerabilities to such conditions.

Lightning: Vulnerability Summary

Table 2.17 shows the portions of each participating community's population, according to HAZUS-MH 3.2 updated Census 2010 population estimates, would be greatly impacted by the loss of electrical energy in their dwellings.

Table 2.17, Community Vulnerable Populations

Jurisdiction	Population over 65	Population under 16	Economically Disadvantaged Population (\$0 - \$20k)
Village of Bear Creek	25	95	2
City of Buda	527	2,414	284
City of Hays	36	37	3
City of Dripping Springs	262	584	41
Hays County	6,784	18,469	2,352
City of Kyle	1,261	9,644	635
Mountain City	55	130	0
City of Niederwald	36	110	32
City of San Marcos	3,013	6,406	6,292
City of Umland	30	155	17
City of Wimberley	703	444	164
City of Woodcreek	549	243	102





Table 2.18, Planning Area Severe Lightning Vulnerability Summaries

Community Lightning Vulnerability Summaries	
Village of Bear Creek	According to community testimony, Bear Creek has experienced lightning strikes that have hit trees and open areas in the community. A notable risk is created by the number of trees in the Village, due to the majority of the 687 acres of the community being made up of residential lots left wooded for the purposes of keeping the community as natural as possible.
City of Buda	According to community testimony, past lightning events in Buda have taken out City WiFi communications for the water towers to the SCADA systems (Supervisory Control and Data Acquisitions). SCADA software application programs are systems for remote monitoring and control that operate with coded signals over communication channels. The interruption of these systems would affect critical infrastructure for the community. In addition, the community is predominantly serviced by surface power lines that are susceptible to lightning strike. There are Comprehensive Plan action items regarding burying power lines along the IH-35 corridor.
City of Hays	The City of Hays has many mature trees, as much of the City is wooded and has an abundance of brush. This type of landscape faces vulnerability to lightning strike that could lead to wildfire ignition. Many of the homes in this community are surrounded by this vegetation and could be engulfed by the resulting blaze. In addition, certain critical infrastructure, such as the City's only water pump station, are vulnerable for loss of service due to a lack of redundancy in systems.
City of Dripping Springs	There are multiple cell towers in Dripping Springs that could be greatly impacted if struck by lightning. Lightning has also been the source of structure fires in Dripping Springs in the past (according to community testimony). This risk is notably higher in the 555 acres classified as a very high fire intensity classification within the community Fire Intensity Report (shown in Wildfires profile).
Hays County	Lightning has impacts on outdoor resources in the community, putting those who are out during storms at risk. In addition, lightning strikes can affect critical infrastructure. An example of such an impact was the possible effects of lightning on Computer-Aided Dispatch system data dissemination. This can lead to an interruption in the emergency response services that County resources are able to provide during storm events. In addition, the many open space areas that are wooded are vulnerable to ignition during lightning strike, and especially during periods of drought.
City of Kyle	The portion of the community with surface power lines, rather than subsurface, is more susceptible to natural hazards. In undeveloped areas with high vegetative growth, the risk of wildfire ignition caused by lightning strike is also higher. People attending outdoor sporting events at schools and sports complexes such as the Gregg-Clarke playing fields are also at risk for injury or even death during lightning events.



Table 2.18, Planning Area Severe Lightning Vulnerability Summaries

Community Lightning Vulnerability Summaries	
Mountain City	Surface power lines create a vulnerability to natural hazards. In Mountain City's recent history, there have been several undocumented incidents (resident testimony without data to provide for analysis purposes) that have resulted in transformer damage that have affected the community's access to power for several hours. There is no generator back-up in City Hall, impacting continuity of operations for the City Government.
City of Niederwald	Niederwald is a community with 10-15% of the jurisdiction made up of undeveloped tracts that can develop large amounts of brush that could become vegetative fuel that ignites due to lightning strike. Due to the intermingling of residences with undeveloped areas, there is a risk to structures and those who reside within them. Periods of drought can also increase the dryness of the vegetation, also increasing the chance of ignition during lightning strikes.
City of San Marcos	<p>According to community testimony, there have been several lightning events in 2016. During one of these events, a lightning strike ignited a structure fire. There are also communications towers in the community that are at risk for strike within the community, however they have lightning protection equipment. In addition, the portion of the power lines in the City that are mounted on poles are also susceptible to lightning strike, and could result in electrical outage.</p> <p>Additional community testimony indicated, that while not occurring within City Limits, there was an incident that occurred at a nearby fire training academy where 2 fire students were struck by lightning while training in an open field. The proximity and severity of this event created a concern for safety from death or injury during lightning events.</p>
City of Uhland	<p>The presence of dead trees, a result of a past drought, creates a vulnerability of those trees acting as fuel for a lightning strike that could ignite a wildfire. This in combination with the amount of areas where residential structures border areas of wildland, creates an increased risk of structures igniting as well.</p> <p>Lightning strikes could also impact the electrical power to the community because 80 percent of the power lines are on poles, with the exception of recent new subdivisions which utilize subsurface electrical utilities.</p>
City of Wimberley	<p>According to community testimony, there have been structure fires ignited as a result of lightning strikes. Lightning has also caused surges to auto-dialers that service alarms for the waste water monitoring system that provides emergency notifications. Lightning has also caused damage to critical infrastructure, as well as blown out community power lines. The community has dead trees that are at an increased risk of igniting in the event of a lightning strike. The community is predominantly serviced by power lines on poles that are susceptible to lightning strike.</p>
City of Woodcreek	Due to a history of lightning events causing tree damage, Woodcreek is very diligent in enforcing their ordinance for removing dead trees from residential properties. There is a water tower located in the hills that is susceptible to lightning due to its location at a higher elevation. The impact upon this critical infrastructure would directly affect every citizen in Woodcreek if water availability was impacted.



Hailstorm

Hailstorm: Description

According to the 2013 State of Texas Hazard Mitigation Plan Update, hail is defined as a frozen precipitation in the form of small balls or lumps usually consisting of concentric layers of clear ice and compact snow.

Hailstorm: Extent Scale

The magnitude of a hail event can be measured using the TORRO Hailstorm Intensity Scale and corresponding diameter index in Tables 2.19 and 2.20.

Table 2.19, TORRO Hailstorm Intensity Scale

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

(TORRO, 2017)

Table 2.20, TORRO Hailstorm Diameter Index

Size Code	Maximum Diameter (mm)	Description
0	5-9	Pea
1	10-15	Mothball
2	16-20	Marble, grape
3	21-30	Walnut
4	31-40	Pigeon's egg > squash ball
5	41-50	Golf ball > Pullet's egg
6	51-60	Hen's egg
7	61-75	Tennis ball > cricket ball
8	76-90	Large orange > Soft ball
9	91-100	Grapefruit
10	>100	Melon

Jurisdiction-specific data for location, previous occurrences, extent, probability, impact, and vulnerability are found in jurisdiction annexes.



Windstorms

Windstorms: Description

A windstorm can be defined as a storm featuring violent winds. Damage from winds can begin at speeds exceeding 41 knots, or approximately 47 mph.

Windstorms: Extent Scale

Wind extent can be measured using the Beaufort Wind Scale Developed in 1805 by Sir Francis Beaufort, U.K. Royal Navy in Table 2.21.

Table 2.21, Beaufort Wind Scale

Force	Wind	WMO	Appearance of Wind Effects	
	(Knots)	Classification	On the Water	On Land
0	Less than 1	Calm	Sea surface smooth and mirror-like	Calm, smoke rises vertically
1	1-3	Light Air	Scaly ripples, no foam crests	Smoke drift indicates wind direction, still wind vanes
2	4-6	Light Breeze	Small wavelets, crests glassy, no breaking	Wind felt on face, leaves rustle, vanes begin to move
3	7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
4	11-16	Moderate Breeze	Small waves 1-4 ft. becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted, small tree branches move
5	17-21	Fresh Breeze	Moderate waves 4-8 ft taking longer form, many whitecaps, some spray	Small trees in leaf begin to sway
6	22-27	Strong Breeze	Larger waves 8-13 ft, whitecaps common, more spray	Larger tree branches moving, whistling in wires
7	28-33	Near Gale	Sea heaps up, waves 13-19 ft, white foam streaks off breakers	Whole trees moving, resistance felt walking against wind
8	34-40	Gale	Moderately high (18-25 ft) waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks	Twigs breaking off trees, generally impedes progress
9	41-47	Strong Gale	High waves (23-32 ft), sea begins to roll, dense streaks of foam, spray may reduce visibility	Slight structural damage occurs, slate blows off roofs
10	48-55	Storm	Very high waves (29-41 ft) with overhanging crests, sea white with densely blown foam, heavy rolling, lowered visibility	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	56-63	Violent Storm	Exceptionally high (37-52 ft) waves, foam patches cover sea, visibility more reduced	
12	64+	Hurricane	Air filled with foam, waves over 45 ft, sea completely white with driving spray, visibility greatly reduced	

(NOAA, 2017)

Jurisdiction-specific data for location, previous occurrences, extent, probability, impact, and vulnerability are found in jurisdiction annexes.





Tornadoes

Tornadoes: Description

According to the 2013 State of Texas Hazard Mitigation Plan Update, a tornado is defined as a rapidly rotating vortex or funnel of air extending ground-ward from a cumulonimbus cloud.

Tornadoes: Extent Scale

The Enhanced Fujita Scale (EF-scale) is a set of wind estimates based on damage used to measure a tornadoes magnitude. The scale uses three-second gusts estimated at the point of damage based on 8 damage levels to 28 damage indicators. The EF Scale and damage indicators are listed in Tables 2.22 and 2.23.

Table 2.22, Fujita (F) Scale and Operational Enhanced Fujita (EF) Scale

Fujita (F) Scale			Derived		Operational Enhanced Fujita (EF) Scale	
F Number	Fastest ¼ mile (mph)	3-second gust (mph)	EF Number	3-second gust (mph)	EF Number	3-second gusts (mph)
0	40-72	45-78	0	65-85	EF Number	3-second gusts (mph)
1	73-112	79-117	1	86-109	0	65-85
2	113-157	118-161	2	110-137	1	86-110
3	158-207	162-209	3	138-167	2	111-135
4	208-260	210-261	4	168-199	3	136-165
5	261-318	262-317	5	200-234	4	166-200

Table 2.23, Enhanced F Scale Damage Indicators

Number (Details Linked)	Damage Indicator	Abbreviation
1	Small barns, farm outbuildings	SBO
2	One- or two-family residences	FR12
3	Single-wide mobile home (MHSW)	MHSW
4	Double-wide mobile home	MHDW
5	Apt, condo, townhouse (3 stories or less)	ACT
6	Motel	M
7	Masonry apt. or motel	MAM
8	Small retail bldg. (fast food)	SRB
9	Small professional (doctor office, branch bank)	SPB
10	Strip mall	SM
11	Large shopping mall	LSM
12	Large, isolated ("big box") retail bldg.	LIRB
13	Automobile showroom	ASR
14	Automotive service building	ASB
15	School - 1-story elementary (interior or exterior halls)	ES





Table 2.23, Enhanced F Scale Damage Indicators

Number (Details Linked)	Damage Indicator	Abbreviation
16	School - jr. or sr. high school	JHSH
17	Low-rise (1-4 story) bldg.	LRB
18	Mid-rise (5-20 story) bldg.	MRB
19	High-rise (over 20 stories)	HRB
20	Institutional bldg. (hospital, govt. or university)	IB
21	Metal building system	MBS
22	Service station canopy	SSC
23	Warehouse (tilt-up walls or heavy timber)	WHB
24	Transmission line tower	TLT
25	Free-standing tower	FST
26	Free standing pole (light, flag, luminary)	FSP
27	Tree - hardwood	TH
28	Tree - softwood	TS

(NOAA, 2017)

Jurisdiction-specific data for location, previous occurrences, extent, probability, impact, and vulnerability are found in jurisdiction annexes.



Expansive Soils

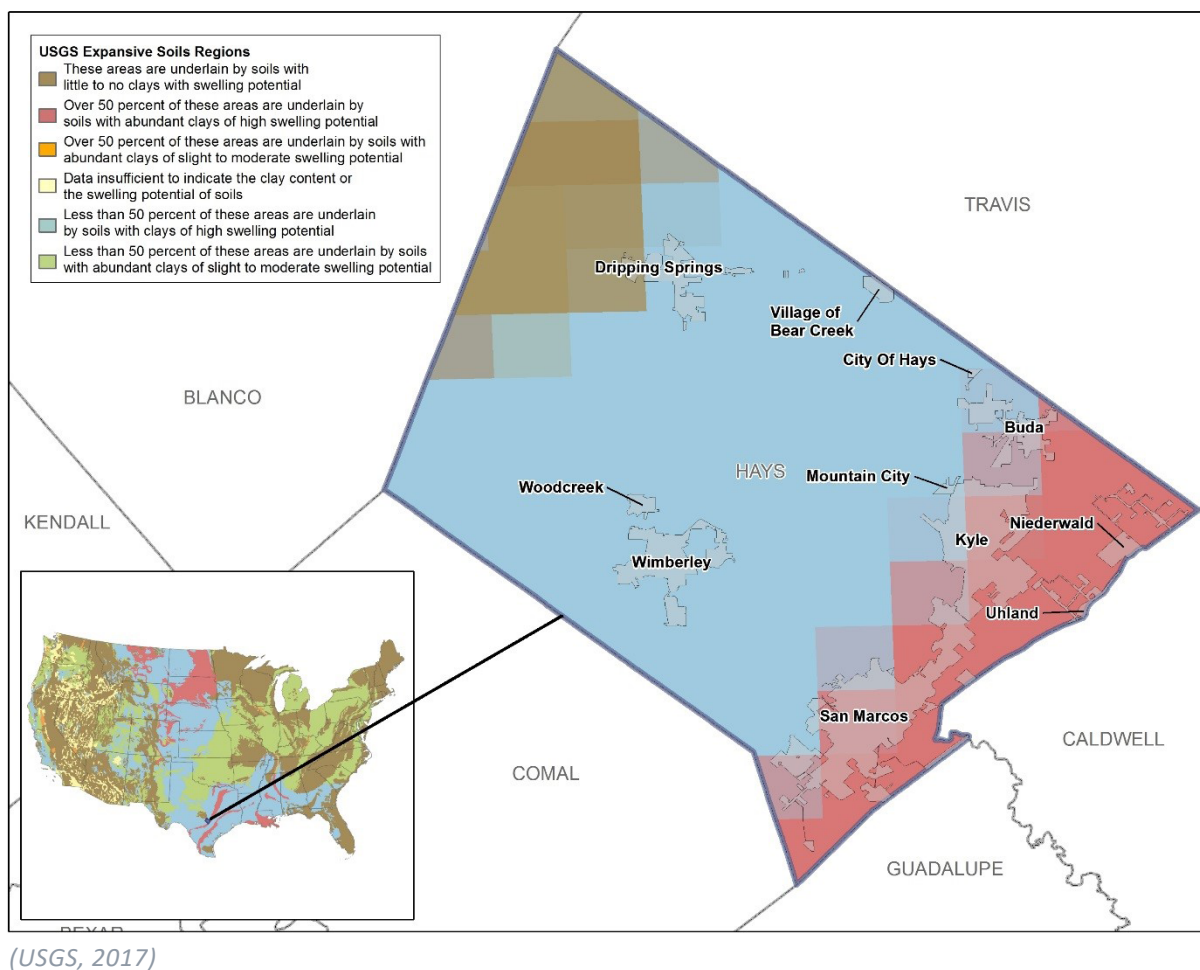
Expansive Soils: Description

According to the 2013 State of Texas Hazard Mitigation Plan Update, expansive soils are defined as soils and soft rock that tend to swell or shrink due to changes in moisture content.

Expansive Soils: Extent Scale

Figure 2.3 illustrates the location of the United States Geological Survey (USGS) Expansive Soils Regions for Hays County. This dataset can be used to determine the extent of an area's underlying soil's swelling potential. Areas underlain with soils with high swelling potential are at more risk.

Figure 2.3, Expansive Soil Regions



Jurisdiction-specific data for location, previous occurrences, extent, probability, impact, and vulnerability are found in jurisdiction annexes.





Floods

Floods: Description

According to the 2013 State of Texas Hazard Mitigation Plan Update, floods are defined as the accumulation of water within a water body and the overflow of excess water into adjacent floodplain lands. If the local basin drainage area is relatively flat, shallow, or slow-moving, floods can last for days. The floodplain is the land adjacent of a river, stream, lake, or other water body that is susceptible to flooding. In drainage areas with substantial slope, or where the channel is narrow

and confined, rapidly moving and extreme high water conditions, called a flash flood, can occur quickly.

Floods: Extent Scale

FEMA has developed flood zone categories showing the potential flood extent, as seen in Table 2.24.

Table 2.24, FEMA Flood Zones

Number (Details Linked)	Damage Indicator
Zone A	Special Flood Hazard Area (SFHA) 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.
Zone AE	SFHA subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown.
Zone AH	SFHA subject to inundation by 1-percent-annual-chance shallow flooding (usually areas of ponding), where average depths are between one and three feet. Base Flood Elevations (BFEs) derived from detailed hydraulic analyses are shown in this zone.
Zone AO	SFHA subject to inundation by 1-percent-annual-chance shallow flooding (usually sheet flow on sloping terrain), where average depths are between one and three feet. Average flood depths derived from detailed hydraulic analyses are shown in this zone.
Zone V	SFHA along coasts subject to inundation by the 1-percent-annual-chance flood event with additional hazards associated with storm-induced waves. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown.
Zone VE	SFHA subject to inundation by the 1-percent-annual-chance flood event, with additional hazards due to storm-induced velocity wave action. Base Flood Elevations (BFEs) derived from detailed hydraulic analyses are shown.

(FEMA, 2017)

Jurisdiction-specific data for location, previous occurrences, extent, probability, impact, and vulnerability are found in jurisdiction annexes.



Hurricanes/Tropical Storms

Hurricanes/Tropical Storms: Description

According to the 2013 State of Texas Hazard Mitigation Plan Update, hurricanes are areas of disturbed weather in the tropics with closed isobars (a line on a map connecting points having the same atmospheric pressure at a given time or on average over a given period) and strong and very pronounced rotary circulation. An area of clear weather, called an “eye”, is present in the center of the circulation. To qualify as a hurricane, the wind speed is 74 mph or more.

Tropical storms are areas of disturbed weather in the tropics with closed isobars and a distinct rotary circulation. The highest wind speed ranges from 39 - 73 mph. Heavy rain, localized flooding, high tides, localized coastal erosion, and minor wind damage can be associated with tropical storms.

Hurricanes/Tropical Storms: Extent Scale

The extent of a hurricane can be measured by using the Saffir-Simpson Hurricane Wind Scale, a 1 to 5 rating based on a hurricane’s sustained wind speed in Table 2.26. The extent of Tropical Depressions and Tropical Storms are listed in Table 2.25.

Table 2.25, Tropical Depression and Tropical Storm Extents

Category	Sustained Winds	Types of Damage Due to Hurricane Winds
Tropical Depression	< 39	Gusts are not considered “hurricane winds” at this classification.
Tropical Storm	39-73	At this point, the distinctive cyclonic shape starts to develop, although an eye is not usually present. Government weather services first assign names to systems that reach this intensity (thus the term named storm).

(US Coast Guard, 2017)

Table 2.26, Saffir-Simpson Hurricane Wind Scale

Category	Sustained Winds	Types of Damage Due to Hurricane Winds
1	74-95 mph	Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
2	96-110 mph	Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
3 (Major)	111-129 mph	Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
4 (Major)	130-156 mph	Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
5 (Major)	157 mph or higher	Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

(NOAA/NWS, 2017)

Jurisdiction-specific data for location, previous occurrences, extent, probability, impact, and vulnerability are found in jurisdiction annexes.



Earthquakes

Earthquakes: Description

According to the 2013 State of Texas Hazard Mitigation Plan Update, earthquakes are defined as a shaking or trembling of the earth that is volcanic or tectonic in origin.

Earthquakes: Extent Scale

The magnitude of an earthquake can be measured with the USGS Mercalli Scale and Peak Ground Acceleration Comparison in Table 2.27.

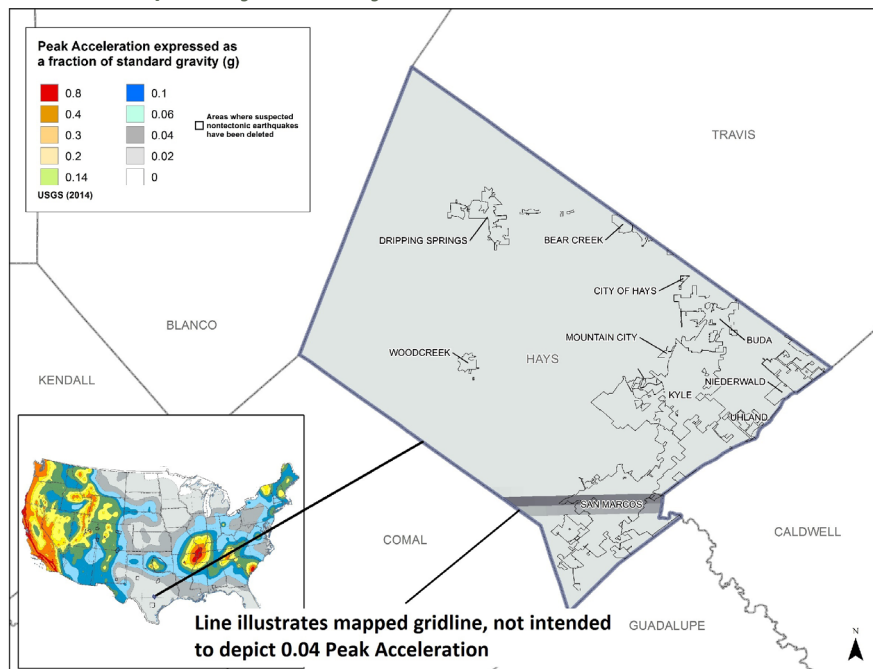
Table 2.27, Mercalli Scale and Peak Ground Acceleration Comparison

Modified Mercalli Scale	Perceived Shaking	Potential Structure Damage		Estimated PGA* (%g)
		Resistant Buildings	Vulnerable Buildings	
I	Not Felt	None	None	<0.17%
II to III	Weak	None	None	0.17% - 1.4%
IV	Light	None	None	1.4% - 3.9%
V	Moderate	Very Light	Light	3.9% - 9.2%
VI	Strong	Light	Moderate	9.2% - 18%
VII	Very Strong	Moderate	Moderate/Heavy	18% - 34%
VIII	Severe	Moderate/Heavy	Heavy	34% - 65%
IX	Violent	Heavy	Very Heavy	65% - 124%
X to XII	Extreme	Very Heavy	Very Heavy	>124%

*PGA measured in percent of g, where g is the acceleration of gravity

Figure 2.4 shows the USGS 10% Probability of Exceedance in 50-Year Map of Peak Ground Acceleration and the respective location of the HMP update areas. The FEMA How-To Guidance, Understanding Your Risks (FEMA 386-2, page 1-7), suggests the earthquake hazard should be profiled if the PGA is greater than 3% g.

Figure 2.4, Peak Ground Acceleration (10% Probability of Exceedance in 50-Year Map of Peak Ground Acceleration) – Hays County Texas



Jurisdiction-specific data for location, previous occurrences, extent, probability, impact, and vulnerability are found in jurisdiction annexes.



Dam/Levee Failure

Dam/Levee Failure: Description

According to the 2013 State of Texas Hazard Mitigation Plan Update, a dam failure is defined as a systematic failure of the dam structure resulting in the uncontrolled release of water, often resulting in floods that could exceed the 100-year floodplain boundaries.

The US Army Corps of Engineers (USACE) defines levees as an earthen embankment, floodwall, or structure along a water course whose purpose is flood risk reduction or water conveyance.

Dam/Levee Failure: Extent Scale

The extent of dam failures can be measured in terms of depth of flooding within the inundation area. Additionally, it can be measured in terms of loss of life, economic impact, and volume of water overtopping into the inundation areas. The Texas Commission on Environmental Quality (TCEQ) provides metrics that classify dams based on this criteria, as seen on Tables 2.28 and 2.29.

Table 2.28, TCEQ Dam Hazard Classifications

Hazard Classification	Human and Economic Impact
Low	No loss of life expected (no lives or permanent habitable structures in the inundation area); Minimal economic loss (failure may cause damage to occasional farms, agricultural improvements, and minor highways).
Significant	Loss of life is possible (1 to 6 lives or 1 to 2 permanent habitable structures in the inundation area); Appreciable economic loss (failure may cause damage to isolated homes, secondary highways, minor railroads, or cause interruption of public services).
High	Loss of life is expected (7 or more lives or 3 or more permanent habitable structures in the inundation area); Excessive economic loss (failure may cause damage to public, agricultural, industrial, or commercial facilities or utilities, and main highways or railroads.)

Table 2.29, TCEQ Dam Size Classification

Size Classification	Impoundment Maximum Storage (Ac-ft)	Height (ft)
Small	At Least 15 & Less Than 1,000	At Least 25 & Less Than 40
	At Least 50 & Less Than 1,000	At Least 6 & Less Than 40
Intermediate	At Least 1,000 & Less Than 50,000	At Least 40 & Less Than 100
Large	At Least 50,000	At Least 100

Jurisdiction-specific data for location, previous occurrences, extent, probability, impact, and vulnerability are found in jurisdiction annexes.





Wildfires

Wildfires: Description

According to the 2013 State of Texas Hazard Mitigation Plan Update, wildfire is a sweeping and destructive conflagration that can be defined as 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. While wildfires can occur anytime of the year, they are most common in the spring and summer months.

Texas Wildfire Risk Assessment Portal (TxWRAP) is the primary mechanism for the Texas A&M Forest Service to deploy risk information and create awareness about wildfire issues across the State. TxWRAP is comprised of a suite of applications tailored to support specific workflow and information requirements for the public, local community groups, government officials, professional hazard-mitigation planners, and wildland fire managers. Collectively, these applications will provide the baseline information needed to support mitigation and prevention efforts across the State.

Wildfires: Extent Scale

TxWRAP also provides Characteristic Fire Intensity Scale (FIS), as seen in Table 2.30. The FIS determines potential fire intensity based on high to extreme weather conditions, fuels, and topography where there are 5 classes with a ten-fold order of magnitude between classes.

Table 2.30, Characteristic Fire Intensity Scale (FIS)

Class 1 Very Low	Very small, discontinuous flames, usually less than one foot in length; very low rate of spread; no spotting. Fires are typically easy to suppress by firefighters with basic training and non-specialized equipment.
Class 2 Low	Small flames, usually less than two feet long; small amount of very short range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.
Class 3 Moderate	Flames up to 8 feet in length; short-range spotting is possible. Trained firefighters will find these fires difficult to suppress without support from aircraft or engines, but dozer and plows are generally effective. Increasing potential for harm or damage to life and property.
Class 4 High	Large flames, up to 30 feet in length; short-range spotting common; medium range spotting possible. Direct attack by trained firefighters, engines, and dozers is generally ineffective, indirect attack may be effective. Significant potential for harm or damage to life and property.
Class 5 Very High	Very large flames up to 150 feet in length; profuse short-range spotting, frequent long-range spotting; strong fire-induced winds. Indirect attack marginally effective at the head of the fire. Great potential for harm or damage to life and property.

(Texas A&M Forest Service, 2017)

Jurisdiction-specific data for location, previous occurrences, extent, probability, impact, and vulnerability are found in jurisdiction annexes.



2.2 Step 2. Identify Community Assets

Community assets were collected through the data collection spreadsheet, phone interviews, and a review of data from FEMA's Hazards United States (HAZUS) data.

HAZUS is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of HAZUS is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, State and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

Graphic representations, as illustrated in Figure 2.5 below, were provided to MPC planners to assist with vulnerability identification when reviewing hazard locations and the assets that exist within them. All reference maps provided during the Risk Assessment meeting are located in Appendix D. Details regarding specific assets that would be impacted by a hazard event are discussed within the vulnerability statements in each jurisdiction annex. These details were mined during data collection, phone interviews and the general risk analysis process.

Figure 2.5, Community Assets

This exhibit has been redacted from this copy of the plan.

People

Hays County and the participating jurisdictions within the planning area have distinct groups of human assets that were identified and considered throughout the Risk Assessment process. The presence of an institute of higher education, outdoor tourist attractions, large outlet shopping centers, and County jail combine with a recent increase in development to make Hays County a unique demographic setting.



These community features result in:

- Areas of dense population
- Visiting populations
- Access and functional needs populations
- Children
- Populations that are dependent on assistance during emergencies

Specific demographics regarding the population of each community's human assets are detailed in their respective jurisdiction annexes.

Economy

Phone interviews and research provided insight into the resources that support the local economy and the vulnerabilities that threaten their ability to recover from an incident. During analysis, the following factors were considered:

- Major employers, primary economic sectors and commercial centers whose losses or inoperability would have severe impacts on the community and its ability to recover from a disaster,
- Dependencies between economic sectors and businesses and infrastructure needed to support communities during recovery from a hazard event.

Built Environment

Existing Structures

Through data submission and community interviews, it was determined that building types vary from community to community, with some having a high number of manufactured homes, some comprised of purely residential structures and others with new subdivisions emerging on a regular basis. With the varying types and ages of buildings, there are varying levels of building resiliency as standards, ordinances, and codes have evolved throughout the years.

Infrastructure and Critical Facilities

Several resources were used in development of graphic and table representations of infrastructure and critical facility assets that are located in each community. Data submissions of GIS data from the communities, County GIS data, FEMA's HAZUS-MH and non-GIS data submissions supported the effort.

Cultural Resources

There are several irreplaceable cultural resources that are very important to the citizens and local government. These sites were located using GIS and non-GIS data submissions of sites such as historical markers, museums, parks or any other protected sites.

Future Development

The potential for future development varies greatly between communities. While some incorporated communities are completely fully developed, others have Economic Development programs that are forecasting significant growth in both residential and industrial sectors.

Natural Environment

Natural resources whose functions benefit and protect the community can be considered among the most important assets to the communities in Hays County.

The diversity of the various rivers, streams and related tributaries within the watersheds are key riparian and floodplain areas that support drainage, floodwater absorption, runoff reduction and flood control and also support the recharge of the aquifer systems that provide water to portions of the communities in the HMP planning area.



2.3 Step 3. Analyze Risks

MPC planners reviewed the hazard and asset data for their communities and used the Halff Risk Ranking Tool worksheet in order to obtain a quantified ranking of risk for each hazard based on:

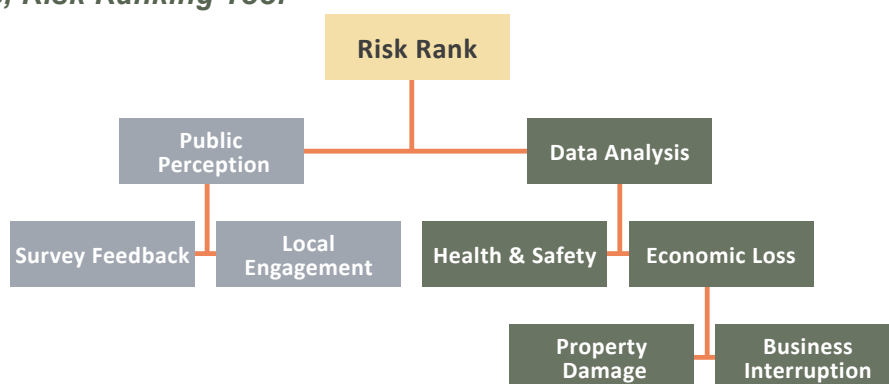
Perception of Risk

- From the Public (via Public Survey results)
- From Planners (via Risk Ranking Tool worksheet)

Analysis of Data by Planners

- Potential for Impact on Health and Safety
- Potential for Impact on Property
- Potential for Impact on Business Continuity

Figure 2.6, Risk Ranking Tool



Perception was ranked on a weighted scale, with public perception making up 25% of the value and planner perception making up the remaining 75% of the value. Public survey result data regarding risk perception by hazard was used to incorporate public input. Hazard risk ranking scores were also used in the prioritization of mitigation action items in Section 3: Mitigation Strategy, within each jurisdiction annex.

The remainder of data used for this ranking used a combination of qualitative/quantitative exposure analysis and was based on planner responses to questions related to the three types of potential impact.

Risk Ranking Worksheet Questions and Answer Classifications

Planners had the choice of selecting High, Medium or Low rankings for each hazard. Each level had a corresponding quantifiable value.

How much impact do the following hazards have on the Health & Safety of people in your community?

Classification	Meaning
High	At least 70% of the population is exposed to the hazard
Medium	Between 40% and 69% of the population is exposed to the hazard
Low	No more than 39% of the population is exposed to hazard

What percentage of the property value in your community is subject to damage from the hazard?

Classification	Meaning
High	At least 50% of the total assessed property value is exposed to hazard
Medium	Between 25% and 49% of the total assessed property value is exposed to hazard
Low	No more than 24% of the total assessed property is exposed to hazard

What level of business interruption could potentially occur to both community and property operations after a significant disaster related to the hazard?

Classification	Meaning
High	Community impacted for more than 7 days
Medium	Community impacted for 1 to 7 days
Low	Community impacted for less than 1 day

Risk Ranking Calculation Considerations

Risk Ranking Worksheets and Public Opinion survey data were input into a utility function that assigned weighted values and calculated risk for each hazard, for each community. The resulting risk rankings provided ranking values. The values ranged from 0 to 100, with the value of 100 equaling the highest level of risk and 0 equaling no risk.

Notably, communities with a higher number of public survey respondents had a greater range of values for risk rankings, providing a more diverse split of values. MPC planners for each community reviewed the results of the risk ranking calculation and approved rankings as they were or recommended edits to the ranking order where they felt results were inaccurate. An example of the ranking is showing in Figure 2.7.

Risk ranking results for each community are found in their respective jurisdiction annex.

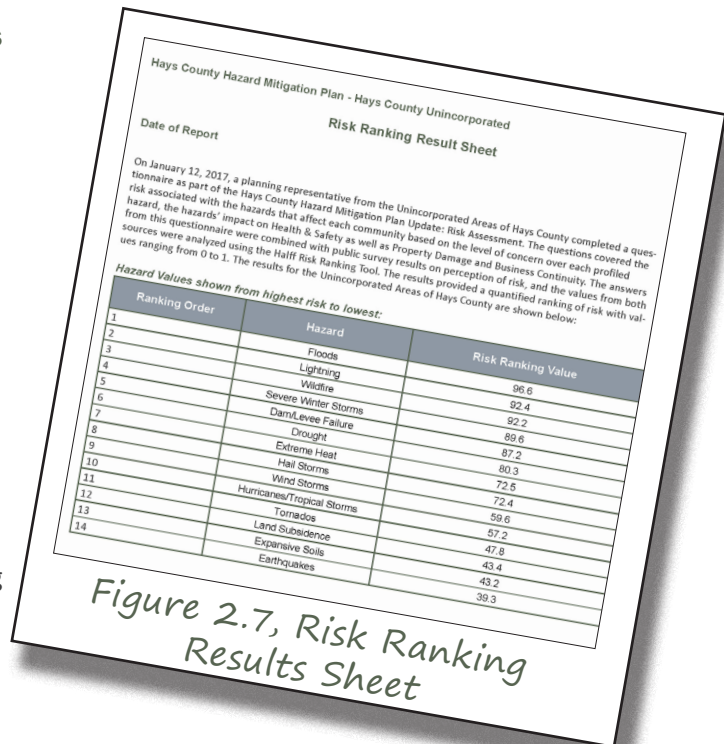


Figure 2.7, Risk Ranking Results Sheet

2.4 Step 4. Summarize Vulnerabilities

National Flood Insurance Program Participation/Losses

The National Flood Insurance Program (NFIP) is a federal program that enables property owners in participating communities to purchase insurance protection, administered by the government, against losses from flooding. Participation in the program requires the appointment of a Floodplain Administrator, the adoption of a Flood Damage Prevention Ordinance and regulation of development within the regulatory Special Flood Hazard Area designated by the FEMA Flood Insurance Rate Maps and Flood Insurance Study (when available). All jurisdictions within Hays County are current participants in the NFIP. Information about each community's NFIP program participation is shown in their respective jurisdiction annex.

The NFIP defines a Repetitive Loss (RL) property as any insurable building for which two or more claims of more than \$1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling ten-year period, since 1978. A RL property may or may not be currently insured by the NFIP. Severe Repetitive Loss (SRL) properties are those that have had at least four NFIP payments over \$5,000 each and the cumulative amount of such claims exceeds \$20,000, or at least two separate claims payments with the cumulative amount exceeding the market value of the building.



Properties that are identified as Repetitive or Severe Repetitive Loss properties are considered vulnerabilities due to the fact that they are documented structures that are repeatedly impacted by flooding hazards. This data is especially important due to the fact that this data may, at times, identify structures that suffer from localized flooding that occurs outside of the designated Special Flood Hazard Area (which maps riverine flooding, and not localized or urban flooding). The use of the RL and SRL data bridges gaps in flood impact data.

Details on community-specific SRL and RL properties are shown in respective jurisdiction annexes.

Defining Significant Risks and Vulnerabilities

Once establishment of hazard areas, extent, impact and probability were complete, and community assets were identified, analysis could be conducted to identify where community-specific vulnerabilities and problem areas existed.

Vulnerability summaries were developed using not only data submissions and GIS data, but also phone interview responses gathered from MPC planners, highlighting their personal areas of concern. Using this technique, individualized problem statements were created to address the varying levels of risk by hazard and by community. Each community's vulnerability summary for each hazard are available within each jurisdiction annex.

Chapter 3: Mitigation Strategy

“The heart of the mitigation plan is the mitigation strategy, which serves as the long-term blueprint for reducing the potential losses identified in the risk assessment. ...describes how the community will accomplish the overall purpose, or mission of the planning process.”

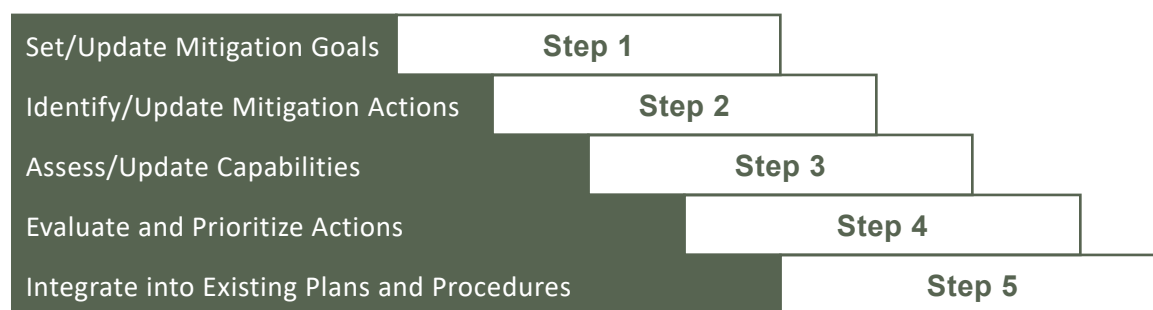
- FEMA Local Mitigation Planning Handbook, 2013

The Mitigation Strategy is made up of:

- Mitigation Goals
- Mitigation Actions
- Action Plan

Mitigation strategy activities were concluded at a 3rd MPC meeting held from 1 pm to 4 pm on February 13, 2017 at the Hays County Government Center in San Marcos, Texas. During the meeting, the MPC conducted 5 activities to update the mitigation goals, actions and action plan. These activities are shown in Figure 3.1 below.

Figure 3.1, Mitigation Strategy Steps



3.1 Step 1. Set/Update Mitigation Goals

The goals set forth in the mitigation strategy drive the overall direction and pulse of the mitigation strategy. The MPC reviewed the 2011 Mitigation Goals during the MPC Mitigation Strategy meeting and held a group discussion to consider modifying them.

2011 Hays County Hazard Mitigation Plan Goals (rescinded)

- Goal 1:** Make Hays County more flood resistant
- Goal 2:** Improve emergency preparedness in Hays County
- Goal 3:** Reduce HAZMAT incidents and corresponding transportation accidents
- Goal 4:** Reduce exposure and damages from wildfire and urban fires
- Goal 5:** Minimize risk of loss of life and damages from tornadoes (and high winds)
- Goal 6:** Reduce the impact of drought in Hays County
- Goal 7:** Mitigate the impacts of extreme heat

Issues Identified with the 2011 Mitigation Plan Goals

- Issue:** The HAZMAT goal was not consistent with the natural hazards scope of the Hazard Mitigation Plan.
- Issue:** Additional hazards were profiled for the 2018 plan update and would necessitate additional goals being written for each one.
- Issue:** Further interrelated water conservation efforts were not specifically mentioned.

Through careful consideration, it was determined that broader goals would serve the plan better than the hazard-specific goals from the 2011 plan.

2018 Updated Mitigation Goals

- Goal 1:** Enhance the abilities of Hays County, and the communities within its boundaries to provide protection of life, property, economy and natural systems from natural hazards.
- Goal 2:** Mitigate vulnerabilities in order to lessen hazard impacts on safety, damage to critical infrastructure/facilities and the capabilities of emergency responders.
- Goal 3:** Incorporate measures that are consistent with the improvement of water conservation efforts in Hays County.

3.2 Step 2. Identify/Update Mitigation Actions

The “who, what, where, when and how” of the HMP exists in the identification of mitigation actions within the mitigation strategy through a review of the risk assessment and assessment of available capabilities. The types of actions identified to mitigate the impact of hazards include the following:

- Local Plans and Regulations
- Structure and Infrastructure Projects
- Natural Systems Protection
- Education and Awareness Programs

3.3 Step 3. Assess/Update Capabilities

Data collection during Phase 1 included submissions of community capabilities. Capabilities included existing legislation, programs, actions and personnel for achieving mitigation. As part of the plan update process, planners also discussed ways to supplement or enhance their existing capabilities in order to achieve mitigation actions.

Capabilities for each community are found in their respective jurisdiction annex within the “Incorporation of Sources” section.

3.4 Step 4. Evaluate and Prioritize Actions (Mitigation Action Plan)

A mitigation strategy is most effective when feasible projects are identified and prioritized for ease of implementation within a detailed mitigation action plan. Planners on the MPC took part in multiple activities in order to update their mitigation action plan.

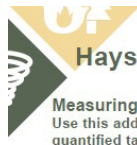
- Activity 1:** Review of existing 2011 mitigation action plan in order to identify:
- a. completed and canceled actions for removal.
 - b. delayed and on-time actions for inclusion in the 2018 mitigation action plan.
- Activity 2:** Identification of gaps in mitigation activities for each hazard.
- Activity 3:** Creation/incorporation of new mitigation action items.
- Activity 4:** Evaluation and prioritization through Mitigation Action Ranking activity.



Measuring Costs

When considering costs, the planners identified construction, administrative, and implementation costs; as well as labor and time required for completion. An example of the form is shown below.

Figure 3.3, Benefit and Cost Review Worksheets



Hays County Hazard Mitigation Plan Update Process

Measuring Benefit of Actions- by non-quantifiable standards
Use this additional table to capture qualitative benefits of your project, in addition to or in lieu of the quantified table above

Risk Reduction (indicate if short or long-term)	
Opportunities to Integrate with Other Community Goals/Initiatives	
Ease of Implementation	
Availability of Funding	
Political/Social Acceptability	

Hays County Hazard Mitigation Plan Update Process

Benefit and Cost Review

Community Name: _____

Person completing questionnaire: _____

A Benefit-Cost review is a way to provide a broad estimate of the quantitative and qualitative costs and benefits associated with each action that is being considered for inclusion in the Hazard Mitigation Plan update. This review is far less specific and detailed than the Benefit-Cost analysis, which is required for technical cost-effectiveness. The following tool can be used for estimating costs and benefits for the Mitigation Action Summary.

Measuring Costs

Construction Cost (\$)

Administrative/Implementation Cost (\$)

Labor (\$)

Time Needed to Complete (\$)

Estimate values based on

Measuring Benefit of Actions- by the numbers
Use this table if the benefits for your project are quantifiable

Category	Factor	Before Mitigation Action	After Mitigation Action	Difference (Use these sentences to fill in the Benefits portion of the Mitigation Action Summary)
Safety/Way of Life	Number of People Affected by the Hazard			
	Amount of Infrastructure/Critical Facilities Affected			
Economic	Number of Acres/Miles Affected			
	Value of Property Affected			
	Number of Businesses Affected			





Creation/Incorporation of Other New Mitigation Action Items

Through data collection conducted throughout Phase 1 (Organize and Review) and Phase 2 (Risk Assessment) activities, MPC planners provided potential resources for measures, projects and regulations that could be incorporated into the HMP. Documents reviewed for incorporation are listed in each jurisdiction's annex.

Evaluation and Prioritization

In order to evaluate feasibility and to analyze prioritization of actions, all new and existing actions were reviewed. This process utilized the Mitigation Action Prioritization Tool (found in Appendix C). This worksheet included consideration of the:

- type of action;
- ranking of how the action meets the listed feasibility criteria; and
- Risk Ranking Score for the hazard that is being mitigated.

Type of Action

Actions were classified as one of the following types:

- Plans/Regulations
- Structure/Infrastructure Projects
- Natural Systems Protection
- Education and Awareness Programs

Definitions and examples of these classification types can be found in Chapter 3 The Mitigation Strategy, Step 2 Identify/Update Mitigation Goals.

Feasibility Criteria Ranking

Planners ranked the feasibility of identified mitigation actions using 1 of 3 ratings.

- +1** Highly effective or feasible
- 0** Neutral
- 1** Ineffective or not feasible

Feasibility considerations included the following criteria:

- Life Safety (How effective will the action be at protecting lives and preventing injuries?)
- Property Protection (How significant will the action be at eliminating or reducing damage to structures or infrastructure?)
- Technical (How technically feasible and long-lasting is the solution? Does the action effectively mitigate the hazard?)
- Political (Is there public support for the action? Would political leaders support it?)
- Legal (Can the community legally implement the action?)
- Environmental (How does the action impact the environment? Would it be compliant with environmental regulations and requirements?)
- Social (Will the action adversely impact any people? Does it disrupt neighborhoods, voting districts or involve the relocation of those with lower incomes?)
- Administrative (Are there administrative and operational capabilities to implement and maintain the action or will work have to be outsourced?)
- Local Champion (Does the project/action have a strong advocate that will support the implementation?)
- Other Community Objectives (Does the action achieve the goals or objectives of any other community plans such as capital improvement, environmental quality or open space preservation? Does it support comprehensive plan policies?)

Use of Risk Ranking Score for Mitigated Hazard

The Risk Ranking Scores were performed during the risk assessment phase of the planning effort and can be found in each jurisdiction's annex. For actions that addressed multiple hazards, the highest risk ranking score from all mitigated hazards was used. This ranking value, added with feasibility ratings, provided a quantified prioritization score.

3.5 Step 5. Integrate into Existing Plans and Procedures

The success of hazard mitigation planning is enhanced by the integration of the adopted actions into processes, programs and regulations that already exist within the community. This eliminates isolating these mitigation efforts and activities to the pages of this document. MPC planners used the same efforts to incorporate existing community activities and policies into the mitigation plan effort.

Plan Goals into Other Community Objectives

Mitigation Plan goals are identified in Chapter 3: Mitigation Strategy- Step 1: Set Update Mitigation Goals. By incorporating these goals into other plan updates and goal-setting activities, the community will create an environment where mitigation becomes a part of normal operations instead of a separate mission.

Each community's potential opportunities for goal incorporation is listed in its respective jurisdiction annex.

Risk Assessment to Inform Plans and Policies

The data collected during risk assessment activities would be extremely valuable in guiding other plan and policy development within communities that are focused in taking a resiliency approach to planning for their future. Through considering hazards as a standard part of existing processes and procedures, the community can ensure safe growth that protects all of its resources, including its citizens. In addition, the results of the Public Opinion Survey would be useful in providing insight on what is important to residents and what they would like to see implemented or improved upon regarding hazard mitigation.

Suggestions for opportunities to use the risk assessment data and public survey results are detailed in each jurisdiction annex.

Mitigation Actions into Other Mechanisms

Mitigation actions written into the mitigation strategy are useful as projects that can easily be incorporated into other community operations. With summaries that full implementation information, the actions are ready for quick inclusion in any other applicable community functions with overlapping missions. Specific actions that can be considered for incorporation for each community are included in the jurisdiction annexes.



Chapter 4: Finalize Plan Update

4.1 Approval and Adoption Procedure

Figure 4.1, Plan Approval Process

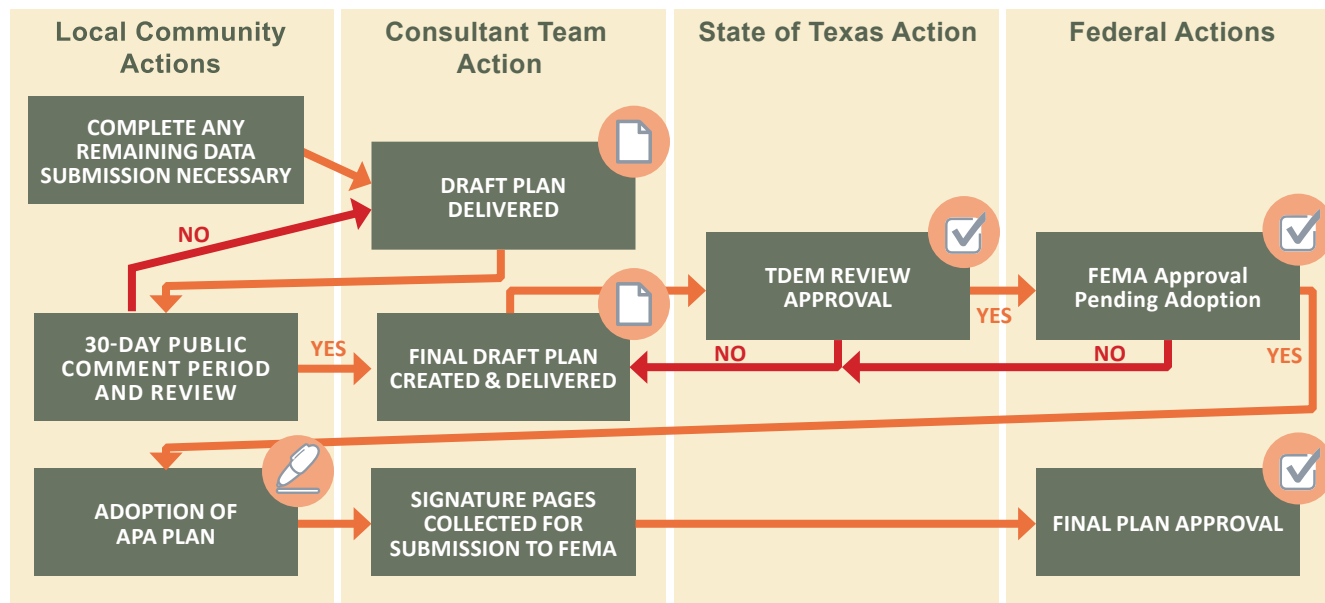


Figure 4.1 outlines the procedure used for approval and adoption for the 2018 Hays County HMP Update. Throughout the update process, the MPC and Stakeholders group had opportunities to provide comments and feedback. Public comment and feedback periods were also coordinated. Details regarding public involvement are included in the Public Participation portion of Chapter 1. On, [insert date] Hays County, on behalf of the MPC, submitted the draft of the 2018 Plan Update for TDEM review and comment. After incorporating TDEM revisions, the HMP was submitted to FEMA Region 6. An Approval Pending Adoption (APA) letter was issued on [insert date]. Documentation of community adoption of the APA plan document was collected and submitted to FEMA Region 6 on (within two months of receipt of APA letter from FEMA). FEMA Region 6 provided a Letter of Approvability on [insert date].



FEMA Approval Pending Adoption Letter Placeholder



FEMA (Final) Official Plan Approval Letter



Table 4.1 lists formal adoption dates for all participating communities.

Table 4.1, Hays County Hazard Mitigation Plan Update – Municipal Jurisdiction Adoption Dates

Municipality	APA Date	Adoption Date
Bear Creek, Village of		
Buda, City of		
Dripping Springs, City of		
Hays, City of		
Kyle, City of		
Mountain City, City of		
Niederwald, City of		
San Marcos, City of		
Uhland, City of		
Wimberley, City of		
Woodcreek, City of		
Hays County Unincorporated Areas		



References

- Department of Commerce. (2017, 03 22). NOAA. Retrieved from Regional Snowfall Index (RSI): <https://www.ncdc.noaa.gov/snow-and-ice/rsi/overview>
- FEMA. (2017, 3 27). FEMA Flood Zones. Retrieved from FEMA: <https://www.fema.gov/flood-zones>
- National Climatic Data Center, U. D. (2017, 9 21). NOAA, National Environmental Satellite, Data, and Information Service. Retrieved from NOAA's Severe Weather Data Inventory: <https://www.ncdc.noaa.gov/swdi/#Intro>
- National Oceanic and Atmospheric Administration Storm Event Database. (2016, 12 01). National Centers for Environmental Information. Retrieved from Data Access: <https://www.ncdc.noaa.gov/data-access>
- NOAA. (2017, March 27). Beaufort Wind Scale. Retrieved from NOAA Storm Prediction Center: <http://www.spc.noaa.gov/faq/tornado/beaufort.html>
- NOAA. (2017, 3 28). Lightning Activity Levels (LAL) Grids. Retrieved from NOAA: <http://www.prh.noaa.gov/hnl/pages/LAL.php>
- NOAA. (2017, 3 27). NOAA . Retrieved from NOAA Storm Prediction Center: <http://www.spc.noaa.gov/faq/tornado/ef-scale.html>
- NOAA/NWS. (2017, 3 27). NOAA/NWS National Hurricane Center. Retrieved from NOAA/NWS: <http://www.nhc.noaa.gov/aboutsshws.php>
- NOAA/NWS. (2017, 3 22). NWS Heat Index. Retrieved from National Weather Service: http://www.nws.noaa.gov/om/heat/heat_index.shtml
- Sperry, S. K. (2017, 03 22). Inotify Knowledge. Retrieved from SPIA Index [™]: <http://www.spia-index.com/>
- Texas A&M Forest Service. (2017, 3 27). Texas Wildfire Risk Assessment Portal (TxWRAP) User Manual. Retrieved from Texas Wildfire Risk Assessment Portal (TxWRAP): https://www.texaswildfirerisk.com/help/txwrap_user_manual.pdf
- Texas Department of State Health Services- Injury Epidemiology & Surveillance Branch. (2017). Texas Health Care Information Collection and Trauma Registry. Austin, TX: Dr. Stacy Jorgensen.
- Texas Department of Transportation. (2017, 03 11). Crash Records Information System. Retrieved from C.R.I.S Query: <https://cris.dot.state.tx.us/public/Query/#/public/welcome>
- TORRO. (2017, 3 28). Hail Scale. Retrieved from Tornado and Storm Research Organization: <http://www.torro.org.uk/hscale.php>
- University of Nebraska-Lincoln. (2016, 12 01). The National Drought Mitigation Center. Retrieved from Drought Impact Reporter: <http://droughtreporter.unl.edu/map/>
- US Coast Guard. (2017, 3 28). Storm Classification. Retrieved from US Coast Guard: <http://www.uscg.mil/lantarea/camslant/hurricane/classification.asp>
- US Drought Monitor. (2016, 12 6). GIS Data Archive. Retrieved from US Drought Monitor: <http://droughtmonitor.unl.edu/MapsAndData/GISData.aspx>
- USGS. (2017, 3 27). Expansive Soil: The hidden force behinds basement and foundation problems. Retrieved from Geology.com: <http://geology.com/articles/soil/>



Hays County
Hays County Hazard
Mitigation Plan Update
2018



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Hays County Annex

Section 1: Organize and Review

This section contains a brief description of Hays County and its features. In addition, Section 1 contains the following details regarding Hays County's:

- participation in the Hays County HMP Update process,
- stakeholder engagement,
- public outreach strategy,
- incorporation efforts, and
- plan maintenance procedures.

*Population :	194,739
Size of Community:	584 sq. miles
*Population over 65 years old	6,784
*Population under 16 years old	18,469
*Economically Disadvantaged Population (\$0-\$20k)	2,352

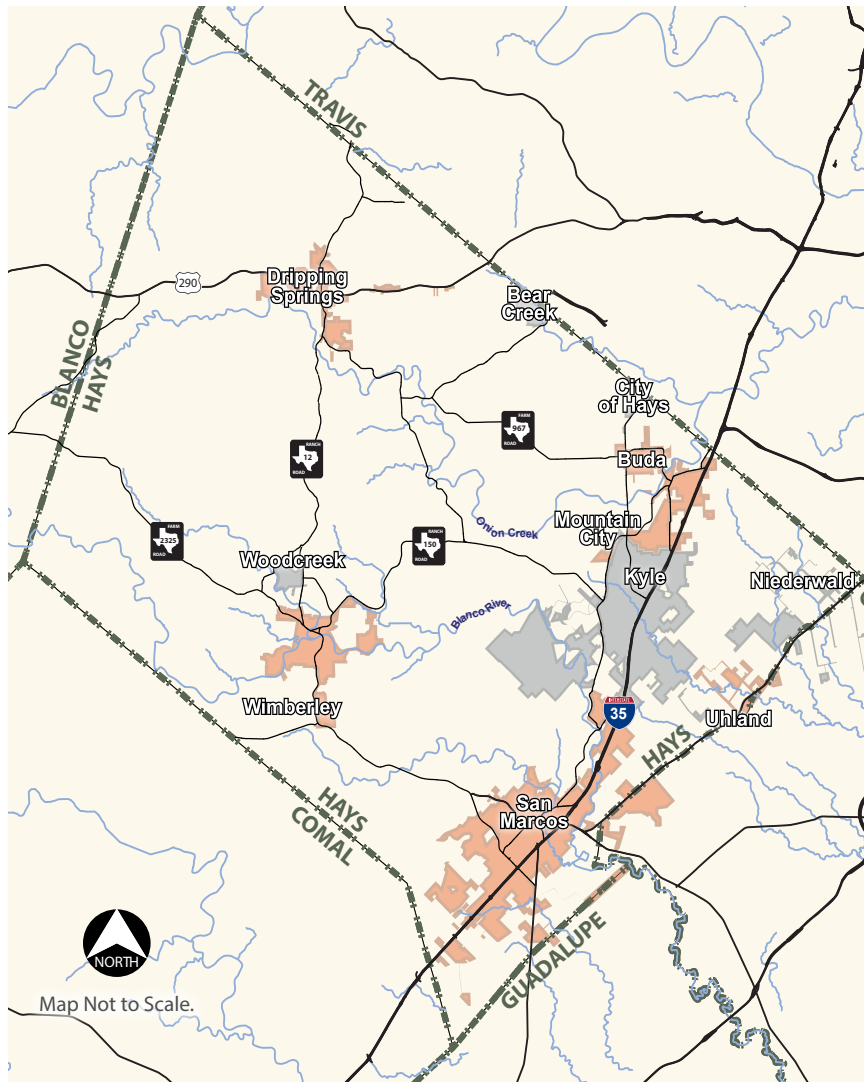
Hays County is serviced by the following responders:

Fire & EMS - Buda Fire Department, Kyle Fire Department, North Hays County Fire Rescue, San Marcos Fire Department, San Marcos Hays County EMS, South Hays Fire Department, ESD#3, Wimberley EMS, Wimberley Fire and Rescue

Law Enforcement- Hays County Sheriff's Office

**HAZUS-MH 3.2 updated Census 2010 Population Estimates*

Figure HC.1, Hays County Planning Area



1.1 Community Description

When planning, it is important to take into account the characteristics that make a community unique. Consideration of unique needs when it comes to mitigating or recovering from natural hazards ensures that all members of the community and their needs are addressed.

Within this jurisdiction annex, reference to the community of Hays County is meant to encompass the areas within the County that are unincorporated.

At the center of Flash Flood Alley, Hays County is located just south of Austin. The County is on the border of 2 river basins, the Colorado and Guadalupe, and has abundant springs, including the San Marcos Springs, fed by the Edwards Aquifer, and the Trinity Aquifer which feeds Jacobs Well. The Edwards and Trinity Aquifers underlie much of the County and are a major source of drinking water for the region. Geographically, the Balcones Escarpment divides the County into 2 distinct areas: the Texas Hill Country to the northwest and the Blackland Prairie to the southeast.

Hays County Hazard Mitigation Plan, Hays County Annex



Demographically, the County economy continues to change as it continues to develop and grow. Listed as one of the nation's 10 fastest growing counties with a population of at least 10,000 for 2017, the population grew by nearly 10,000 new residents during 2016 (MacCormack, 2017). Major highways that pass through Hays County include Interstate 35 (IH-35), U.S. Highway 290 (HWY 290), State Highway 21 (HWY 21), and State Highway 80 (HWY 80).

Children in the unincorporated areas within Hays County attend schools within San Marcos Consolidated, Dripping Springs Independent, Wimberley Independent and Hays Consolidated school districts. Hays County's main utility providers are shown in Table HC.1.

The planning area are governed by a County Judge and 4 elected Commissioners. The County Government Center is located in the County Seat, San Marcos, and employs 832 people.

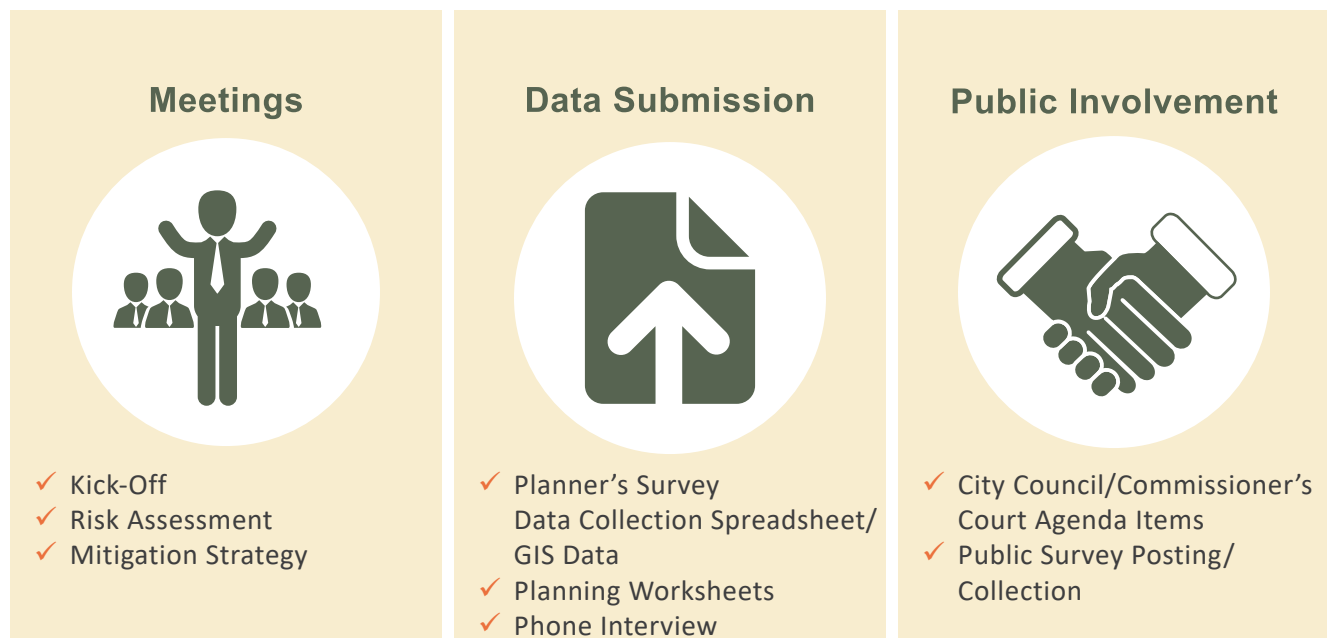
Table HC.1, Utility Providers (not an all-inclusive listing)

Type	Provider
Electric	Pedernales Electric Cooperative (PEC)/Bluebonnet Electric Cooperative
Water	Many water service providers

Community Planning Involvement

MPC planning activities for the Hays County Hazard Mitigation Plan (HMP) Update are captured in Figure HC.2, which utilizes check-marks to indicate each of the activities that were completed by Hays County MPC members.

Figure HC.2, Hays County Plan Participation





1.2 Outreach Strategy

Hays County was very active in the following outreach activities used to request public participation in the Hays County HMP Update.

Public Survey Promotion

Hays County advertised the Hays County HMP Update Public Survey on the Hays County homepage <http://www.co.hays.tx.us/>.

As of March 10, 2017, Hays County had 242 residents respond to the public survey. Details on how the survey data was directly incorporated into the Risk Ranking process for hazards is included in Chapter 2, the risk assessment portion of the main plan document.

Commissioners Court Announcement

On January 31, 2017, the Hays County Grants Administrator presented information on the Hays County HMP Update to the Hays County Commissioners Court. Elected officials, local agency leaders and members of the public attended the meeting. The agenda and item report for this presentation are included in Plan Appendix A.

Plan Phase Newsletters

Hays County MPC utilized newsletters for each phase of the planning process in order to share updates with stakeholders, elected officials, County staff and the public. Copies of the newsletters can be found in Plan Appendix A.

Plan Draft Public Review and Comment Period

The draft Hays County HMP Update was posted on the Hays County website from July 12, 2017 to July 26, 2017 and a hard copy was placed in the Hays County Government Center for public review. No public comments were received during this review period.



1.3 Incorporation of Sources

In addition to stakeholder and public input, the MPC also reviewed other County planning resources that could provide useful information for the plan update process. Table HC.2 lists the documents reviewed and how they were considered for incorporation in the updated plan.

Table HC.2, Review/Incorporation of Sources

Name of Document	Type	How Incorporated
2013 State of Texas HMP	Plan	Utilized hazard definitions and hazard classification names.
Flood Insurance Study	Study	Incorporated best available hydraulic and hydrologic study results for flood hazard profile.
Hays County Strategic Policy and Implementation Plan 2010	Plan	<p>This plan is a framework for decision-making for the Commissioners Court. Considered incorporation for objectives to:</p> <ul style="list-style-type: none"> • Coordinate existing and future County plans • Coordinate with local plans • Hold a Water Summit with Cities, MUDs, developers, River Authorities, Conservation Districts, water conservation and environmental groups • Support the Edwards Aquifer Authority's efforts to implement impervious cover restrictions • Increase education and outreach to residents on the importance of water quality, quantity and preservation • Work with AgriLife extension and landowners to support Texas Watershed Steward Program, brush management, creekside conservation, and other efforts to protect water quality and quantity • Incorporate Water Quality Best Practices into all road projects • Work with TxDOT, developers and others to focus their mitigation projects where most beneficial <p>(Hays County, 2010)</p>
Water and Wastewater Facilities Plan for the Portion of Hays County West of the IH-35 Corridor	Plan	<p>Reviewed in order to consider recommendations:</p> <p>In the northwestern and north central portion of the County:</p> <ul style="list-style-type: none"> • Expand water conservation efforts and use of rainwater collection systems in lieu of using limited Trinity groundwater; • Expand water reuse opportunities <p>In the northeastern portion of the County:</p> <ul style="list-style-type: none"> • Expand water conservation efforts and use of rainwater collection systems in lieu of using limited Edwards groundwater <p>In the southwestern portion of the County:</p> <ul style="list-style-type: none"> • Expand water conservation efforts and use of rainwater collection systems in lieu of using limited Trinity groundwater • Expand water reuse opportunities <p>In the southeastern portion of the County:</p> <ul style="list-style-type: none"> • Expand water conservation efforts and use of rainwater collection systems in lieu of using limited Edwards groundwater <p>Countywide</p> <ul style="list-style-type: none"> • The County and other jurisdictions within the County should continue to promote and incentivize water management actions that are more sustainable, including broad support for water conservation and reuse, and rainwater collection systems as an alternative to groundwater <p>(HDR Engineering, Inc., 2011)</p>

Table HC.2, Review/Incorporation of Sources (cont.)

Name of Document	Type	How Incorporated
Hays County Regional Habitat Conservation Plan	Plan Overview Presentation	“Mitigation = acres of bird habitat protected and managed in perpetuity; also expressed as a “conservation credit”. (Sedgwick LLP, 2013)
Hays County FM 150 West Character Plan	Report	Reviewed presentation for presence of mitigation practices or consideration - none found. (Hays County , 2015)
Property Assessed Clean Energy (PACE) Program Proposed for Hays County	Report	Reviewed report of the efforts of this program to enable private sector owners of family residential properties with 5 or more dwelling units to obtain loans to pay for water conservation, energy efficiency, and renewable energy retrofits Benefits of the program related to mitigation: <ul style="list-style-type: none"> • Reduce demand on electricity grid • Support the State’s water conservation plan and better enable the County to meet its water conservation goals
Jacob’s Well Natural Area Master Plan	Plan	Reviewed the easement restrictions set by the plan for impervious cover, existing improvements not allowed in the floodplain. Improvements/Restoration efforts: <ul style="list-style-type: none"> • Wetland planting and soil stabilization • Weather station to monitor local conditions • Rainwater collection • Sedimentation pond to filter runoff from parking overflow to secondary pond • Cisterns to hold collected water • Decrease impervious cover and demonstrate rain gardens • Rehabilitation of prairie • Enhanced vegetation with native plants to filter runoff • Enhance native plants for bank stabilization (RVi Planning + Landscape Architecture, 2012)



Section 2: Risk Assessment

Hays County Jurisdictional Hazards



This section contains Hays County's hazard profiles for each natural hazard included in the Hays County HMP Update. Profiles include:

- Location - the area where the hazard is known to occur
- Previous Occurrences - a history of reported events for the hazard
- Significant Previous Occurrences (when applicable) - notable hazard events within the community
- Extent - the strength or magnitude of the hazard
- Probability - the likelihood of the hazard event occurring in the future
- Impact - the consequence or effect (or possible effect) of hazard events
- Vulnerability Summary - identification of structures, systems, populations or assets susceptible to loss or damage and how they are/could be impacted

Hazard descriptions and extent scales for hazard magnitudes are found in Chapter 2, the risk assessment portion of the main plan document.

When available, data specific to the unincorporated portions of Hays County was used for hazard analysis. When no instances were reported specifically for that area for regional hazards, County-wide data (including incorporated jurisdictions) was applied.

State and national datasets were used to determine occurrence, extent, and the respective probabilities, rather than verbal testimonies, in an effort to retain data consistency. For some hazards, the National Oceanic and Atmospheric Administration (NOAA) Storm Events Database was used as the most comprehensive data available for hazards. The Storm Events Database does not always reflect the most recent totals for fatality, injury and damage amounts for previous hazard occurrences. The Previous Occurrences paragraph identifies instances in which these inaccuracies may occur. Verbal testimony, when available, was integrated into impact or vulnerability summaries to account for updates in this data.

2.1 Hazard Profiles

Hazards profiled within the risk assessment include:

- Drought - Within Chapter 2, the risk assessment portion of main plan document.
- Extreme Heat - Within Chapter 2, the risk assessment portion of main plan document.
- Severe Winter Storms - Within Chapter 2, the risk assessment portion of main plan document.
- Lightning - Within Chapter 2, the risk assessment portion of main plan document.
- Hailstorms
- Windstorms
- Tornadoes
- Expansive Soils
- Floods
- Hurricanes/Tropical Storms
- Earthquakes
- Dam/Levee Failure
- Wildfires



Hailstorms

Hailstorms: Location

The entire extent of Hays County is exposed to some degree of hail hazard. Since hail can occur at any location, hail events could be experienced anywhere within the planning area.

Hailstorms: Previous Occurrences

According to the NOAA Storm Events Database, there were 57 hail events reported for Hays County and its unincorporated jurisdictions since the year 1967.

Hailstorms: Extent and Probability

The Tornado and Storm Research Organization (TORRO) created a hail extent index to measure hail called the Hailstorm Intensity Scale. According to the reported previous hail occurrences for the planning area, the maximum hail extent experienced was up to 3 inches, or 76.20 millimeters, in diameter. This size corresponds to a TORRO Hailstorm Intensity Scale classification of a “Super Hailstorm.” Refer to Chapter 2, the risk assessment portion of the main plan document, for the TORRO hail extent scale descriptions.

Based on 57 reported events in 49 years, a hail event occurs in Hays County approximately once a year, on average. Since hail events can happen anywhere throughout the HMP planning area, Hays County unincorporated areas’ future probability is assumed to be similar to the entire County area. The planning area’s probability for a hail event is approximately once every year (on average) in the future, with hail up to 3 inches, or 76.20 millimeters, in diameter, corresponding to a TORRO Hailstorm Intensity Scale classification of a “Super Hailstorm.”

Hailstorms: Impact

Based on the maximum hail extent experienced (76.20 mm), the TORRO Hailstorm Intensity Scale (found in Chapter 2, the risk assessment portion of the main plan document) indicates that impact can be expected to include any of the following:

- Varying degrees of damage to vegetation and crops
- Damage to plastic structures
- Varying degrees of damage to glass
- Paint and wood scored
- Vehicle bodywork damage
- Varying degrees of roof damage
- Varying degrees of risk of injuries
- Varying degrees of aircraft damage
- Brick walls pitted
- Risk of severe or even fatal injuries to persons caught in the open

Hailstorms: Vulnerability Summary

Hays County structures roofs and windows are susceptible to hail damage, to include the County Government Center, County Health Building, Commissioners Court Building, Emergency Services Building, Juvenile Detention Center, and the Sheriff’s Office as they are not retrofitted or hardened for resistance to hail damage.

Current plans for the new public safety building will include covered parking for police vehicles. Future plans could incorporate retrofitting and reinforcing existing roofs and windows.





Windstorms

Windstorms: Location

The entire extent of Hays County is exposed to some degree of wind hazard. Since wind can occur at any location, wind events could be experienced anywhere within the planning area.

Windstorms: Previous Occurrences

According to the NOAA Storm Events Database, there were 38 wind events reported for Hays County and its unincorporated jurisdictions since the year 1974.

Windstorms: Extent and Probability

Wind is measured by the Beaufort Wind Scale that relates wind speed to observed conditions on land and sea. According to the reported previous windstorm occurrences in the jurisdiction, the maximum wind extent experienced was 70 knots (corresponding to Beaufort Wind Classification: Hurricane). Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of wind extent scales.

Based on 38 reported events in 42 years, a wind event occurs in Hays County approximately once every year, on average. Since wind events can happen anywhere throughout the HMP planning area, Hays County's unincorporated areas' future probability is assumed to be similar to the surrounding County area. In the future, Hays County's probability for a wind event of up to 70 knots, or 80.55 miles per hour (Hurricane Classification in the Beaufort Wind Scale), is approximately once every year (on average).

Windstorms: Impact

Data from the Texas Department of Transportation's Crash Records Information System (CRIS) shows that between the years of 2010 and 2017, rural Hays County experienced 5 crashes related to severe crosswind weather conditions (see Table HC.3). There were no injuries reported from these crash events.

Table HC.3, Windstorms, Vehicle Accidents, Hays County

City	Fatality	Incapacitating Injury	Incapacitating Non-Injury	Possible Injury	Crash Year	Street Name	Surface Condition	Weather Condition
Rural Hays County	0	0	0	0	2010	LIME KILN RD	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2017	US0290	Wet	Severe Crosswinds

(Texas Department of Transportation, 2017)





Additional impacts from extreme wind events could include downed utility poles, street signals, and debris on roadways resulting in obstructions for emergency responders and residents entering and leaving their homes.

Structures can be damaged by flying debris and impact from winds damaging rooftops and causing other structural damage. Manufactured homes are especially vulnerable to damage that high winds can cause, to include destruction in the most extreme event conditions.

Critical infrastructure could be disrupted, resulting in periods of impact to service of residents due to damages to the facilities themselves or lack of back-up utility resources.

Windstorms: Vulnerability Summary

Hays County has previously experienced debris accumulation on roadways during past windstorm events. Such incidents could cause impact on the ability of public safety officials to respond to emergency calls. According to the Office of Emergency Services, a large-scale event requiring extensive debris removal over the entire County area, approximately 926 miles of roadway within the unincorporated areas, would be unmanageable for the County to handle as an individually funded effort.

Structures built prior to more stringent building codes, as well as manufactured homes within the unincorporated areas, would be more vulnerable to structural damage from extreme wind events than site-built structures built to higher building standards.

There are many sites of critical facilities and infrastructure that are located within the unincorporated areas of Hays County (according to spatial HAZUS data and community submitted critical facility data) that are not retrofitted to mitigate damages from extreme wind events. These facilities include: North Hays County Fire Rescue, South Hays Fire Department, Buda Fire Stations 1 and 3, San Marcos Hays County EMS, Office of the Justice of the Peace, Road and Bridge Department, and the Development Services Department. Damages sustained by an extreme wind event to these facilities could hinder the ability to provide crucial services needed by the community.





Tornadoes

Tornadoes: Location

The entire extent of Hays County is exposed to some degree of tornado hazard. Since tornadoes can occur at any location, tornado events could be experienced anywhere within the planning area.

Tornadoes: Previous Occurrences

It can be assumed that NOAA reported events described as “HAYS County”, “Countywide”, or under an unincorporated jurisdiction impacted Hays County’s unincorporated Areas. Table HC.4 lists the 16 tornado events reported for Hays County and its unincorporated jurisdictions since the year 1953

Fatality, injury and damage amounts are shown in Table HC.4, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table HC.4, Tornado Events, Hays County

Location	Date	Type	Extent	Fatalities	Injuries	Property Damage	Crop Damage
Hays County	4/28/1953	Tornado	F3	1	5	250,000.00	0.00
Hays County	4/30/1954	Tornado	F1	0	0	250,000.00	0.00
Hays County	5/2/1958	Tornado	F1	0	0	30.00	0.00
Hays County	11/12/1961	Tornado	F2	0	0	2,500.00	0.00
Hays County	9/20/1967	Tornado	NA	0	0	250.00	0.00
Hays County	9/20/1967	Tornado	NA	0	0	30.00	0.00
Hays County	5/10/1975	Tornado	F1	0	0	25,000.00	0.00
Hays County	3/30/1976	Tornado	F2	0	0	25,000.00	0.00
Hays County	3/30/1976	Tornado	F2	0	1	250,000.00	0.00
Hays County	8/10/1980	Tornado	F2	0	0	25,000,000.00	0.00
Hays County	4/22/1985	Tornado	F2	0	0	250,000.00	0.00
Hays County	8/22/1991	Tornado	F1	0	0	2,500.00	0.00
Countywide	5/13/1994	Tornado	F0	0	0	500.00	500.00
Henly	11/15/2001	Tornado	F0	0	1	50,000.00	0.00
Driftwood	10/8/2002	Tornado	F0	0	0	70,000.00	0.00
Mt. Gainor	5/23/2015	Tornado	EF0	0	0	0.00	0.00
Total				1	7	\$26,175,810.00	\$500.00

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)

Tornadoes: Extent and Probability

Tornadoes are measured by severity on the Fujita and Enhanced Fujita Scales, with a range from 0-6. According to the reported previous tornado occurrences in the planning area, the maximum tornado extent experienced was a category F3 tornado in 1953. Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of the Fujita (F) Scale and Operational Enhanced Fujita (EF) Scale.

Based on 16 reported events in 63 years, a tornado event occurs approximately every 4 years on average in Hays County. Hays County’s unincorporated areas’ future probability is assumed to be similar to the entire County area. The planning area’s probability of a tornado event is approximately once every 4 years (on average) in the future, with up to an F3 magnitude.





Tornadoes: Impact

Tornadoes in Hays County could impact roadways due to the large amount of vegetation and other objects that become debris due to high winds that accompany a funnel cloud. This debris could also cause physical harm to residents who may be outside during such an event. The wind speeds and debris caused by tornadoes can impact all residents in the community.

Based on Hays County's past experience of tornadoes from F0 to F3 levels, if similar events were to happen in the future, the type of impacts that the planning area could expect associated with those magnitudes would include, from least to greatest:

- Light Damage - Broken branches; shallow rooted trees pushed over; some chimney damage.
- Moderate Damage - Surface damage to roofs; mobile homes pushed off foundation; moving vehicles pushed off the road.
- Significant Damage - Frame houses have roof torn off; mobile homes completely destroyed; train boxcars overturned; large trees snapped or uprooted; smaller debris turned into missiles.
- Severe Damage - Roofs completely torn off well-constructed buildings, along with some walls; majority of trees uprooted; trains overturned; vehicles lifted off the ground.

(Tornado Facts, 2016)

Structures can be damaged by flying debris and impact from tornado winds, damaging rooftops and causing other structural damage. Manufactured homes are especially vulnerable to damage that tornadoes can cause, to include destruction in higher magnitude events.

Critical infrastructure, such as utility poles and street signals, could also be disrupted, impacting all residents in the affected area. Debris on the roadway can also cause obstruction for emergency responders' ability to provide services.

Tornadoes: Vulnerability Summary

Tornado impact on County infrastructure could result in power outages, blocked roads, and damaged structures. Hays County has previously experienced debris accumulation on roadways during past windstorm events. This illustrates vulnerability as severe winds and debris are associated with tornadoes. Such incidents could cause impact on the ability of public safety officials to respond to emergency calls.

Residential homes that were built prior to more stringent building codes, as well as manufactured homes, would be highly vulnerable to the high winds and conditions associated with tornado events. Visitors to parks and other outdoor attractions, such as Jacob's Well Natural Area and the Five Mile Dam Parks Complex, are at risk if they are not familiar with proper sheltering procedures.

There are no sirens in the unincorporated parts of the County; however, there is an Emergency Notification System that allows registrants to receive alerts to mobile phones by call, text and email. This system depends on voluntary registration, which may not account for reaching visitors and tourists. Social media posts, radio stations, weather radios, FEMA's iPAWS (Integrated Public Alert System), CMAS, and HaysInformed.com are other ways that the County reaches out to the public that may reach all audiences, including visitors.

There are many critical facilities and infrastructure that are located within the unincorporated areas of Hays County (according to spatial HAZUS data and community-submitted critical facility data) that are not retrofitted to mitigate against extreme winds associated with tornado events. These facilities include: North Hays County Fire Rescue, South Hays Fire Department, Buda Fire Stations 1 and 3, San Marcos Hays County EMS, Office of the Justice of the Peace, Road and Bridge Department, and the Development Services Department. Damages sustained by a tornado event to these facilities could hinder the ability to provide crucial services needed by the community.





Expansive Soils

Expansive Soils: Location

According to the USGS Expansive Soils Regions, Figure 2.3 in Chapter 2 (the risk assessment portion of the main plan document), the western side of Hays County's unincorporated area is underlain with soils with little to no clays with swelling potential. However, the central region of Hays County has less than 50% of the area underlain by soils with clays of high swelling potential. The eastern side of the planning area has over 50% of the area underlain with soils that have abundant clays with high swelling potential. This is the area with the highest magnitude of expansive soil potential in the County.

Expansive Soils: Previous Occurrences

There was no documentation of past site-specific events of structural damage due to expansive soils from local, State, or national databases queried. However, local testimony and the presence of foundation repair contractors in this region indicates that minor foundation shifting and narrow cracks in walls have occurred. See section below for reference to the worst areas in the County for shrink-swell potential.

Expansive soils cannot be documented as a time-specific event, except when they lead to structural and infrastructure damage. There are no specific damage reports or historical records of events in the planning area, however future events can occur.

Expansive Soils: Extent and Probability

Considering the amount of swelling potential within the planning area, and the lack of reported events, the probability of a future event is low (0 - 1 occurrences in the next 10 years affecting less than 5 structures).

Expansive Soils: Impact

Impact to the Southeastern part of the County includes undocumented cracking of ground and foundations, creating minor damage to structures. Increased severity in weather and natural conditions lead to increased soil swelling, resulting in deeper and longer cracks in terrain and structure foundations, and possible structural shifting.

Expansive Soils: Vulnerability Summary

Areas within Hays County are experiencing higher amounts of development on previously undeveloped land and may face an increase in structural foundation damage to new structures in areas with high clay content. The boundaries of extraterritorial jurisdictions are continuing to grow and the development of more land between Austin and Hays County can lead to identifying new areas of expansive soil. Based on community testimony (without accompanying data for calculating probability and extent), unincorporated areas surrounding Umland and Niederwald are known problem areas for expansive soils. These locations are the most vulnerable to foundation and structural problems, as well as damage to roads and other infrastructure.



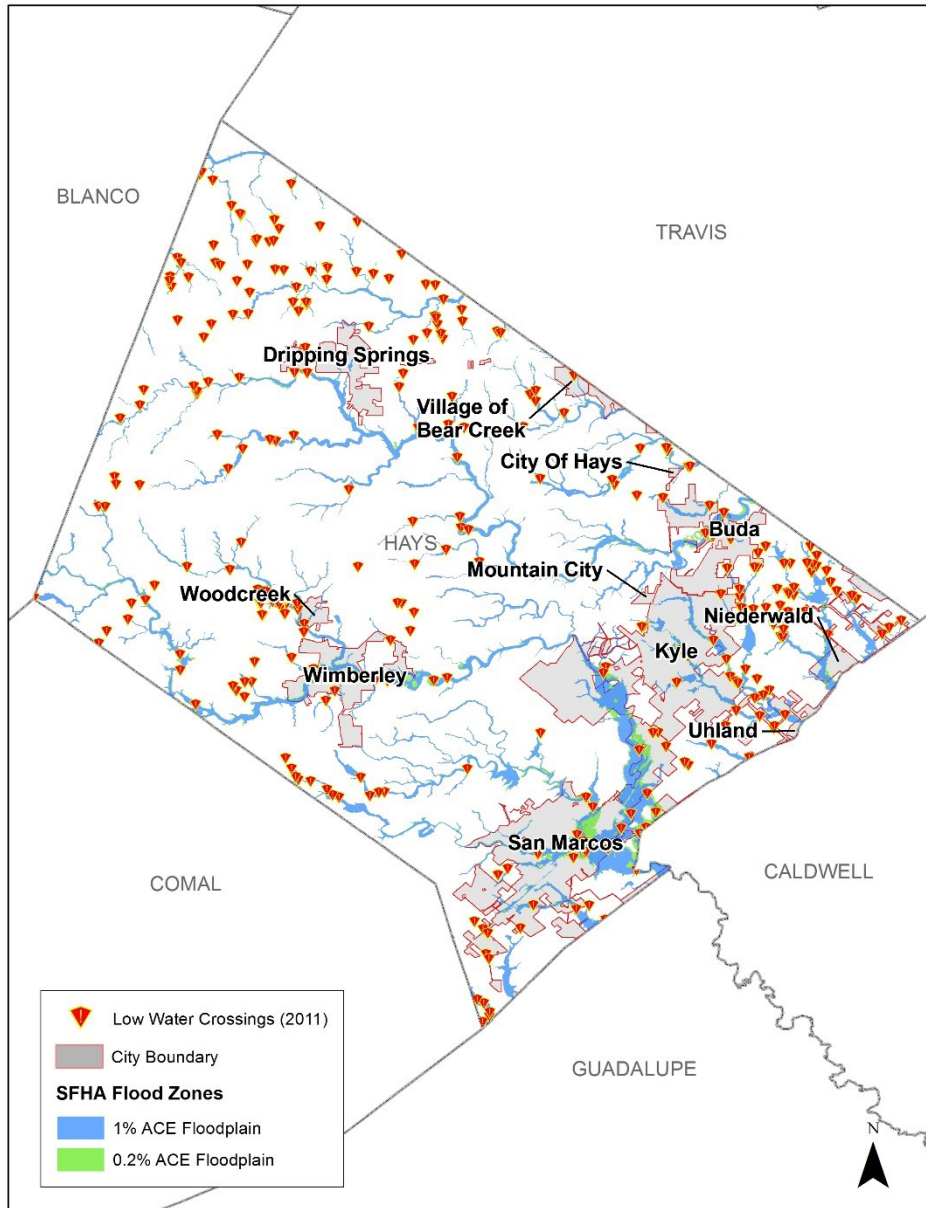


Floods

Floods: Location

The location of low water crossings, as well as the 1% (100 year) and 0.2% (500 year) Annual Chance Event (ACE) floodplains for Hays County, are shown in Figure HC.3. This figure represents the areas most affected by riverine flooding and is based upon newly developed hydrologic and hydraulic analysis. The new analysis is considered the best information available to date. Table HC.5 provides the total acreage in the jurisdiction that is located in the 1% and 0.2% floodplains.

Figure HC.3, Special Flood Hazard Areas and Low Water Crossings, Hays County



(Texas Natural Resources Information System, 2011)



Table HC.5, Hays County Floodplain Acreage

Jurisdiction	100yr (1%) Floodplain Acres (Includes Floodway)	500yr (0.2%) Floodplain Acres (Includes 100yr)
Hays County (Unincorporated Areas)	30,200	33,901



Floods: Previous Occurrences

It can be assumed that NOAA reported events described as ‘Countywide’, ‘HAYS (ZONE)’, ‘...Portion’, or within unincorporated cities, impacted Hays County’s unincorporated areas. Table HC.6 lists the 69 documented events reported for Hays County and its unincorporated jurisdictions from the year 1997 to 2016. The County received 3 disaster declarations for flooding since October of 2013. Not all of these are reflected in the table below due to the nature of event location designations within NOAA’s database. Instead, these events were reported under specific

jurisdictions in that database. However, these had significant impact on the County. Narratives detailing these significant events are included in this annex under *Floods: Significant Past Events*.

Fatality, injury and damage amounts are shown in Table HC.6, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table HC.6, Flood Events, Hays County

Location	Date	Type	Fatalities	Injuries	Property Damage	Crop Damage
Countywide	5/23/1997	Flash Flood	0	0	10,000.00	0.00
Countywide	6/6/1997	Flash Flood	0	0	10,000.00	0.00
Countywide	6/7/1997	Flash Flood	0	0	15,000.00	0.00
Countywide	6/8/1997	Flash Flood	2	7	2,500,000.00	50,000.00
Countywide	6/21/1997	Flash Flood	0	0	5,000.00	0.00
Countywide	6/22/1997	Flash Flood	0	0	50,000.00	50,000.00
Countywide	2/21/1998	Flash Flood	0	0	5,000.00	0.00
Countywide	7/3/1998	Flash Flood	0	0	20,000.00	0.00
Countywide	8/22/1998	Flash Flood	0	0	20,000.00	10,000.00
Countywide	8/23/1998	Flash Flood	0	0	10,000.00	0.00
Countywide	10/17/1998	Flash Flood	0	100	500,000.00	50,000.00
HAYS (ZONE)	10/17/1998	Flood	0	25	4,000,000.00	50,000.00
HAYS (ZONE)	10/17/1998	Flood	0	25	4,000,000.00	50,000.00
Countywide	6/21/1999	Flash Flood	0	0	3,000.00	0.00
Countywide	6/9/2000	Flash Flood	0	0	15,000.00	0.00
Countywide	11/2/2000	Flash Flood	0	0	20,000.00	0.00
HAYS (ZONE)	11/4/2000	Flood	0	0	0.00	0.00
North Portion	8/26/2001	Flash Flood	0	0	10,000.00	0.00
Countywide	8/31/2001	Flash Flood	0	0	20,000.00	0.00
Countywide	8/31/2001	Flash Flood	0	0	30,000.00	20,000.00
Countywide	11/15/2001	Flash Flood	0	20	200,000.00	50,000.00
HAYS (ZONE)	11/15/2001	Flood	0	0	0.00	0.00
West Portion	6/30/2002	Flash Flood	0	0	10,000.00	0.00
HAYS (ZONE)	7/1/2002	Flood	0	0	0.00	0.00
South Portion	7/1/2002	Flash Flood	0	0	0.00	0.00
Countywide	7/2/2002	Flash Flood	0	0	0.00	0.00
West Portion	7/3/2002	Flash Flood	0	0	0.00	0.00
West Portion	7/5/2002	Flash Flood	0	0	0.00	0.00
South Portion	9/19/2002	Flash Flood	0	0	0.00	0.00
South Portion	10/24/2002	Flash Flood	0	0	0.00	0.00



Hays County Hazard Mitigation Plan, Hays County Annex

Table HC.6, Flood Events, Hays County , (cont.)

Location	Date	Type	Fatalities	Injuries	Property Damage	Crop Damage
Countywide	11/4/2002	Flash Flood	0	0	0.00	0.00
Countywide	2/20/2003	Flash Flood	0	0	10,000.00	0.00
West Portion	6/13/2003	Flash Flood	0	0	5,000.00	0.00
South Portion	9/11/2003	Flash Flood	0	0	3,000.00	0.00
Northwest Portion	1/16/2004	Flash Flood	0	0	3,000.00	0.00
East Portion	6/5/2004	Flash Flood	0	0	0.00	0.00
Countywide	6/9/2004	Flash Flood	0	0	350,000.00	0.00
Driftwood	6/26/2004	Flash Flood	0	0	0.00	0.00
West Portion	6/27/2004	Flash Flood	0	0	0.00	0.00
West Portion	6/28/2004	Flash Flood	0	0	0.00	0.00
Countywide	6/29/2004	Flash Flood	0	0	0.00	0.00
South Portion	6/30/2004	Flash Flood	0	0	0.00	0.00
HAYS (ZONE)	6/30/2004	Flood	0	0	0.00	0.00
West Portion	7/25/2004	Flash Flood	0	0	0.00	0.00
Countywide	10/2/2004	Flash Flood	0	0	0.00	0.00
Countywide	10/23/2004	Flash Flood	0	0	0.00	0.00
HAYS (ZONE)	10/23/2004	Flood	0	0	0.00	0.00
HAYS (ZONE)	10/24/2004	Flood	0	0	0.00	0.00
Countywide	11/16/2004	Flash Flood	0	0	0.00	0.00
HAYS (ZONE)	11/17/2004	Flood	0	0	0.00	0.00
Countywide	11/21/2004	Flash Flood	0	0	0.00	0.00
Countywide	11/22/2004	Flash Flood	0	0	0.00	0.00
Countywide	11/22/2004	Flash Flood	0	0	0.00	0.00
Southeast Portion	11/23/2004	Flash Flood	0	0	0.00	0.00
South Portion	5/6/2006	Flash Flood	0	0	0.00	0.00
Henly	3/30/2007	Flash Flood	0	0	0.00	0.00
Driftwood	3/30/2007	Flood	0	0	0.00	0.00
Henly	5/2/2007	Flash Flood	0	0	0.00	0.00
Henly	7/2/2007	Flash Flood	0	0	0.00	0.00
Henly	5/17/2010	Flash Flood	0	0	0.00	0.00
Driftwood	9/7/2010	Flash Flood	0	0	0.00	0.00
Driftwood	5/10/2012	Flash Flood	0	0	0.00	0.00
Driftwood	5/11/2012	Flash Flood	0	0	0.00	0.00
Fitzhugh	5/17/2015	Flash Flood	0	0	0.00	0.00
Henly	5/30/2015	Flash Flood	0	0	0.00	0.00
Fitzhugh	6/14/2015	Flash Flood	0	0	0.00	0.00
Driftwood	10/30/2015	Flash Flood	0	0	10,000,000.00	0.00
Fitzhugh	5/19/2016	Flash Flood	0	0	0.00	0.00
Driftwood	8/16/2016	Flash Flood	0	0	0.00	0.00
Totals			2	177	\$21,824,000.00	\$330,000.00

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)



Floods: Significant Past Events



The County received 3 disaster declarations for flooding since October of 2013. Aside from the October 2015 event reported under the unincorporated jurisdiction of Driftwood, these events are not reflected in Table HC.6. Due to the nature of NOAA's reporting, the other events described below were reported under incorporated jurisdictions. These events did, however, substantially affect Hays County, its unincorporated areas and several incorporated jurisdictions. Narratives detailing these significant events are included below.

According to NOAA Storm Events Database, in October of 2013 (Disaster 4159-DR), a surface trough was the focus of trailing storms which produced heavy rainfall that led to major flooding across the Onion Creek and Blanco/San Marcos River watersheds. Thunderstorms produced heavy rain that led to flash flooding in Wimberley, San Marcos, Buda, and Kyle. Public reports stated that 14 inches of rain fell near Wimberley and this rainfall made its way into the Blanco River and Onion Creek Watersheds. Rainfall totals near Buda and Kyle were upwards of 8 to 10 inches. The Blanco River flooded and major flooding occurred downstream to San Marcos. The Blanco River crested at 26.74 feet in Wimberley. The Blanco River USGS gage at Kyle crested at 35.92 feet. Flooding then occurred in the San Marcos River as the flood wave crossed IH-35. Reports indicate that the Blanco River was near or slightly higher than the 1998 flood of record. Sections of San Marcos flooded near the Blanco River, including areas of Texas State University and areas along River Road, where several evacuations of residences occurred. The Blanco River was 100 feet out of its banks. In many areas along the Blanco River, debris was found 15 to 20 feet off the ground. Several roads needed repair and several homes were flooded out. Across Hays County, 47 homes sustained minor damage, 24 sustained major damage, and 1 home was destroyed. It was also reported that 4 businesses sustained major damage including the Buda Fire Department station and Buda Elementary.

According to NOAA Storm Events Database, in May of 2015 (Disaster 4223-DR), a historic flash flood occurred on the Blanco River. Hundreds of homes were destroyed along the river from the City of Blanco down into Wimberley and San Marcos. The flood wave continued downstream for days, affecting residents and homes along the San Marcos and Guadalupe Rivers.

Flood damage throughout Hays County





Early estimates show damages in excess of 100 million dollars. Thunderstorms produced more heavy rain that caused flash flooding. The Fischer Store Road Bridge over the Blanco River was destroyed by flood waters west of Wimberley. Downstream from the bridge, the Blanco River reached a record crest in Wimberley.



Flood damage throughout Hays County

The gage failed at 40 feet and the USGS later estimated the crest at 44.9 feet and 175,000 cfs. This height was more than 10 feet over the previous record height of 33.3 feet from 1929. Homes along the banks of the Blanco River from the City of Blanco, through Wimberley, and down to San Marcos experienced a historic flood. Many homes were totally destroyed and swept downstream. Other homes were struck by large debris, including full-sized cypress trees that typically lined the banks of the river. The river experienced rises that exceeded 20 feet within 1 hour. Overall, 321 homes were destroyed in Hays County, (including Wimberley and San Marcos), with hundreds more heavily damaged. According to the Office of Emergency Services, FEMA awarded over 3.5 million dollars in public assistance to Hays County in response to this disaster.

According to NOAA Storm Events Database, in October of 2015 (Disaster 4245-DR), a warm front combined with an upper level trough and deep moisture produced heavy rainfall and severe thunderstorms across much of South Central Texas on October 30th and 31st. Excessive rainfall resulted in widespread flash flooding along the IH-35 corridor. Rainfall rates on the order of 5 to 7 inches per hour fell, from northern San Marcos through South Austin. Some daily rainfall totals exceeded 15 inches. Record flooding occurred in portions of Hays County. River and creek flooding was extensive across the County. Many areas, especially San Marcos, compared this flooding to the record flooding of October 1998. Estimates of 2000 homes were flooded in or near the IH-35 corridor, where many of them were destroyed or sustained major damage.

Floods: Extent

Flood extent is described through a combination of ground elevation, river heights, 100-year Water Surface Elevations (WSE's) and HAZUS depth grids. Areas along the major rivers and streams throughout the County, such as the San Marcos and Blanco Rivers and Onion Creek, are exposed to the greatest extent of a flood event. An example of flooding within the jurisdiction is the area along Onion Creek, outside of the unincorporated community of Driftwood. This area had an approximate overbank ground elevation of 895-900 feet with an intersecting 100-year WSE of 900 feet. For a 100-year event, water depths of approximately 5 feet can be expected within this area. A further analysis of Onion Creek is described below.

With Onion Creek having an approximate in-channel elevation of 879.5 feet (per Light Detection and Ranging [LiDAR] data and USGS data) and an intersecting WSE of approximately 900 feet, flood depths would be 20.5 feet.

Floods: Probability

Probability has been calculated on the basis of NOAA reported events, as a standard, consistent calculation method for all hazards profiled with the Hays County HMP. Based on 69 reported events in 19 years, a flood event occurs approximately 3 to 4 times per year on average in Hays County and its unincorporated areas. Due to the size and extent of some flood occurrences, as well as the regional nature of reports in the NOAA Storm Events Database, Hays County's unincorporated areas' future probability is assumed to be similar to the entire County area. The planning area can expect a flood event approximately 3 to 4 times per year (on average) in the future, up to 20.5 feet in depth.



Hays County Hazard Mitigation Plan, Hays County Annex

Floods: Impact

The following describes the inventory counts and building replacement values for the jurisdictional area.

Hays County (Unincorporated Areas) Building Counts			
Residential	Commercial	Other	Total
24,738	860	579	26,177

Hays County (Unincorporated Areas) Building Replacement Value		
Building (\$)	Content (\$)	Total (\$)
7,944,608,057	4,372,683,580	12,317,291,637

A Probabilistic 100-year Return Period HAZUS-MH 3.2 analysis was run on Hays County. This analysis utilized the best available LiDAR (COA 2012 and CAPCOG 2008) and Depth Grids. HAZUS results are calculated to census blocks, producing results based on national averages for similar-sized communities. These blocks were then intersected with Hays County to run a weighted area analysis for jurisdictional results. The following paragraphs describe results from the 100-year Return (1% Annual Chance Event) weighted area analysis.

Flood damage throughout Hays County





HAZUS-MH Results

General Building Stock Damage

HAZUS estimates that about 531 buildings will be at least moderately damaged in Hays County's unincorporated areas. 'At least moderately damaged' is defined by HAZUS as greater than 10% damage to a building. The majority of damage can be expected to impact residential areas (98%). The remaining damages (2%) are expected for commercial, industrial, agriculture and religious buildings.

Residential Buildings	Commercial Buildings	Other Buildings	Total Buildings
523	4	4	531

Building-Related Losses

Exposed Value is the total building and content values for structures within the community. The exposed value for the community is \$12,317,291,637. The total building-related losses were \$230,640,064 for this scenario. This represents 1.9% of the total replacement value of the community. Loss values are divided into building and content loss dollars.

Building Loss (\$)	Content Loss (\$)	Total Loss (\$)
141,193,070	89,446,994	230,640,064

Essential Facility Damage

HAZUS does not estimate any critical facilities or infrastructure interruption for more than 1 day. The model estimates that 100% of community hospital beds would be available for use by patients already in the hospital and for those injured by an event.

Debris Generation

HAZUS estimates the amount of debris that will be generated in this scenario. The model estimates that a total of 29,068 tons of debris will be generated. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1,163 truckloads (with 1 to 25 tons per truck) to remove the building debris generated in this scenario.

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS also estimates the number of people displaced that will require accommodations in temporary public shelters. The model estimates 2,353 people will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 1,691 people are estimated to seek temporary shelter in public shelters.

Floods: Vulnerability Summary

Hays County is in the heart of "Flash Flood Alley," an area known worldwide for its instances of fast and powerful flows of flood water with little warning. While many efforts are under way to mitigate flooding in the area, the effects of flooding are difficult to control in this region. There are many low water crossings within the planning area. During a flooding event, these crossings present residents with challenges in traveling safely to or from their homes, as well as first responders from accessing or responding to distress calls. Flood warning systems are in place and enhancements to the systems are ongoing. However, there is an issue with emergency messaging, as many people turn the geo-locating function off on their mobile devices. The geo-locating feature on mobile devices is critical to County



Emergency Management messaging systems’ ability to reach devices within the affected geographic area.

The large transient population, from the university campus, workplaces and tourist destinations, pose a risk due to unfamiliarity with flooding and alternate routes to bypass flood-prone roads and bridges.

Floodwaters cripple electrical services, which also power water lift and pump stations that provide water to homes and businesses. Roads that act as major thoroughfares are impacted and transportation that moves through the area has to detour onto other roads, causing traffic backups and secondary accidents.

Structures in flood prone areas and even areas outside of the mapped Special Flood Hazard Areas can experience inundation and, at times, even be washed off their foundations during exceptional flooding events. The recent magnitude of floods in the County yielded water depths so high that flood gages failed. Flooding is by far one of the most prevalent hazards in Hays County.

National Flood Insurance Program Repetitive Loss (RL)

Hays County currently participates in the National Flood Insurance Program (NFIP) and has 103 tallied RL payments (as of September of 2016) with an average total (building & contents) payment of \$50,741.31.

Structure Type	Number of Structures	Amount of Claims
Residential	41	\$4,297,512.69
Non-Residential	3	\$861,415.82



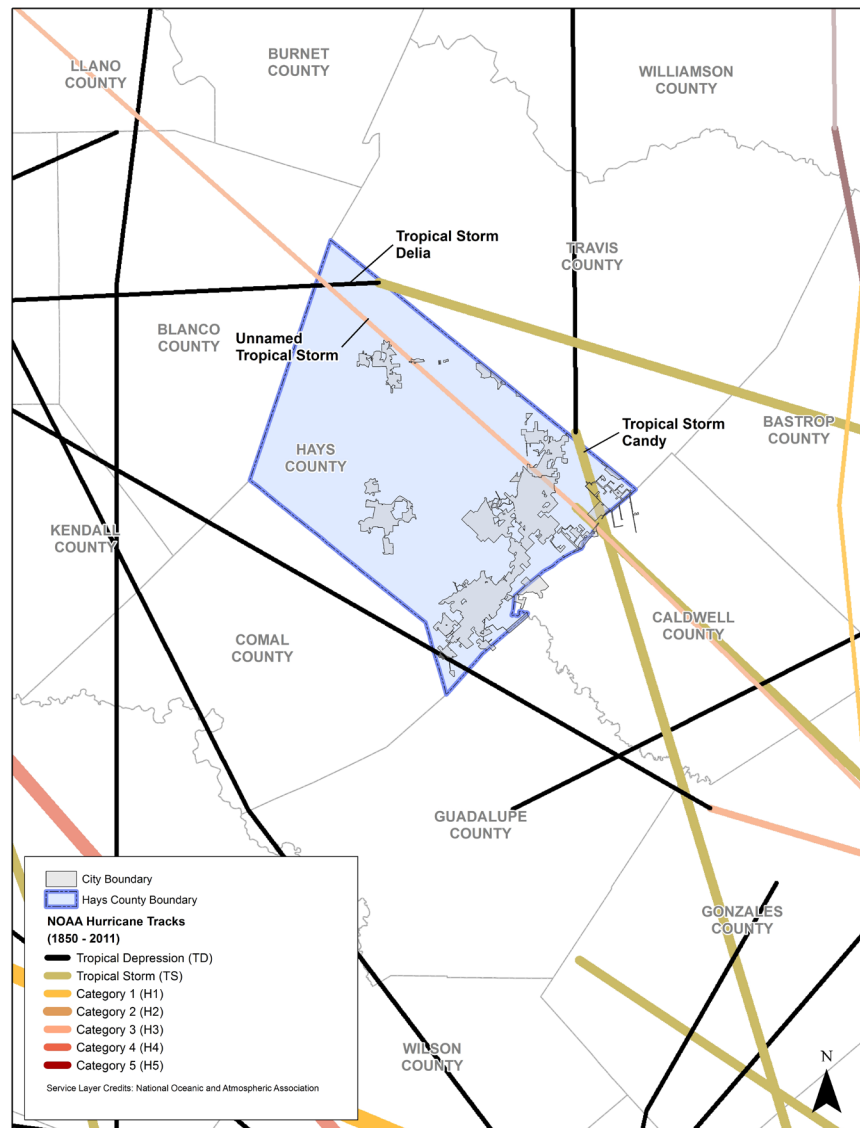


Hurricanes/Tropical Storms

Hurricanes/Tropical Storms: Location

Due to the regional nature of a hurricane or tropical storm event, the entire extent of Hays County is equally exposed to a hurricane or tropical storm. Figure HC.4 illustrates the location of the planning area with historical hurricane and tropical storm paths documented by NOAA's Hurricane Tracker from 1850 to 2011.

Figure HC.4, Historical Hurricane/Tropical Storm Paths, Hays County



(National Oceanic and Atmospheric Administration, 2016)



Hurricanes/Tropical Storms: Previous Occurrences

Previous events are described below based on the NOAA Storm Events Database for Tropical Storm Hermine and NOAA Hurricane Tracker for all other events. By the time most hurricanes reach the County, they are tropical storms, depressions or thunderstorms. Because hurricane and tropical storm events occur on a regional scale, all events listed for Hays County have been included, as they would impact Hays County's unincorporated areas.

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July 13 to July 22, 1909 – An unnamed storm made landfall near Freeport, as a Category 3 Hurricane. This storm impacted Hays County and participating communities as a tropical depression with wind speeds up to 30 knots. No significant damages, injuries, or fatalities were reported for the planning area.

June 22 to June 26, 1968 – Tropical Storm Candy made landfall near Port Aransas. This storm impacted Hays County and participating communities as a tropical storm with wind speeds slowing to 30 knots as a tropical depression just after leaving the County. No significant damages, injuries, or fatalities were reported for the planning area.

September 1 to September 7, 1973 – Tropical Storm Delia made landfall near the border of Brazoria and Matagorda Counties. This storm impacted Hays County and participating communities as a tropical storm with wind speeds slowing to 30 knots as a tropical depression just after leaving the County. No significant damages, injuries, or fatalities were reported for the planning area.

September 6 to September 8, 2010 – According to the NOAA Storm Events Database, Tropical Storm Hermine made landfall near the Texas/Mexico border on the night of September 6. South Central Texas was hit very hard with widespread rains of 8 to 12 inches across much of the IH-35 corridor, from Austin down to San Antonio.

Hurricanes/Tropical Storms: Extent and Probability

The Saffir-Simpson Scale measures pressure, wind speed, and storm surge in 5 categories. According to the reported previous hurricane occurrences in the planning area, the maximum hurricane extent experienced was categorized as a tropical storm. Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of storm extents.

Based on 4 reported events in 107 years, a hurricane or tropical storm event occurs approximately every 27 years on average in Hays County. Since hurricane and tropical storm events can happen anywhere throughout the HMP update area, the unincorporated areas of the County future probability is assumed to be similar to the entire County area. In the future, the planning area can expect an event approximately once every 27 years on average, of up to a magnitude of a tropical storm at a 100-year Max Wind Speed of 78 mph, based on historical extents and HAZUS analysis.

Hurricanes/Tropical Storms: Impact

A Probabilistic 100-year Return Period HAZUS-MH 3.2 analysis was run for Hays County. The following paragraphs describe the results of this analysis.

HAZUS-MH Results

General Building Stock Damage

The total property damage losses were \$14,530,046. The majority of damage can be expected to impact residential areas (98%). The remaining damages (2%) are for commercial, industrial, agricultural and religious buildings. While some building damage is experienced, it is estimated that no buildings will be completely destroyed or experience severe damage. Exposed Value is the total building and content values for structures within the community. Loss values are divided separately for building and content loss in dollars.

Exposed Value (\$) (Building + Content)	Building Loss (\$)	Content Loss (\$)	Total Loss (\$)
12,317,291,637	14,530,046	47,882	14,577,928





Essential Facility Damage

HAZUS does not estimate any critical facilities or infrastructure to be interrupted for more than 1 day. The model estimates that 100% of available hospital beds would be available for use by patients already in the hospital and for those injured by the hurricane.

Debris Generation

HAZUS estimates the amount of debris that will be generated by the hurricane at a total of 1,017 tons. Of the total amount, Brick/Wood comprises 100% of the total. If the building debris tonnage is converted to an estimated number of truckloads, it will require 41 truckloads (with 1 to 25 tons per truck) to remove the building debris generated by the hurricane.

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of people displaced that will require accommodations in temporary public shelters. The model estimates no households to be displaced due to the hurricane. While there is an estimation of over \$14,000,000 in property damages expected, it is aforementioned that “no buildings would be completely destroyed or experience severe damage.” Residents would likely remain in their homes as damages were repaired, therefore it is estimated that no temporary shelter is needed.

Hurricane/Tropical Storms: Vulnerability Summary

Similar to the impacts of windstorms, hailstorms, and lightning, Hays County can expect to be impacted with debris and possible utility interruptions of critical infrastructure if the event is a stronger magnitude than those previously experienced by the County. In addition, the community’s proximity to IH-35 could lead to traffic delays caused by major evacuation efforts, if the highway is used as an evacuation route for coastal residents.



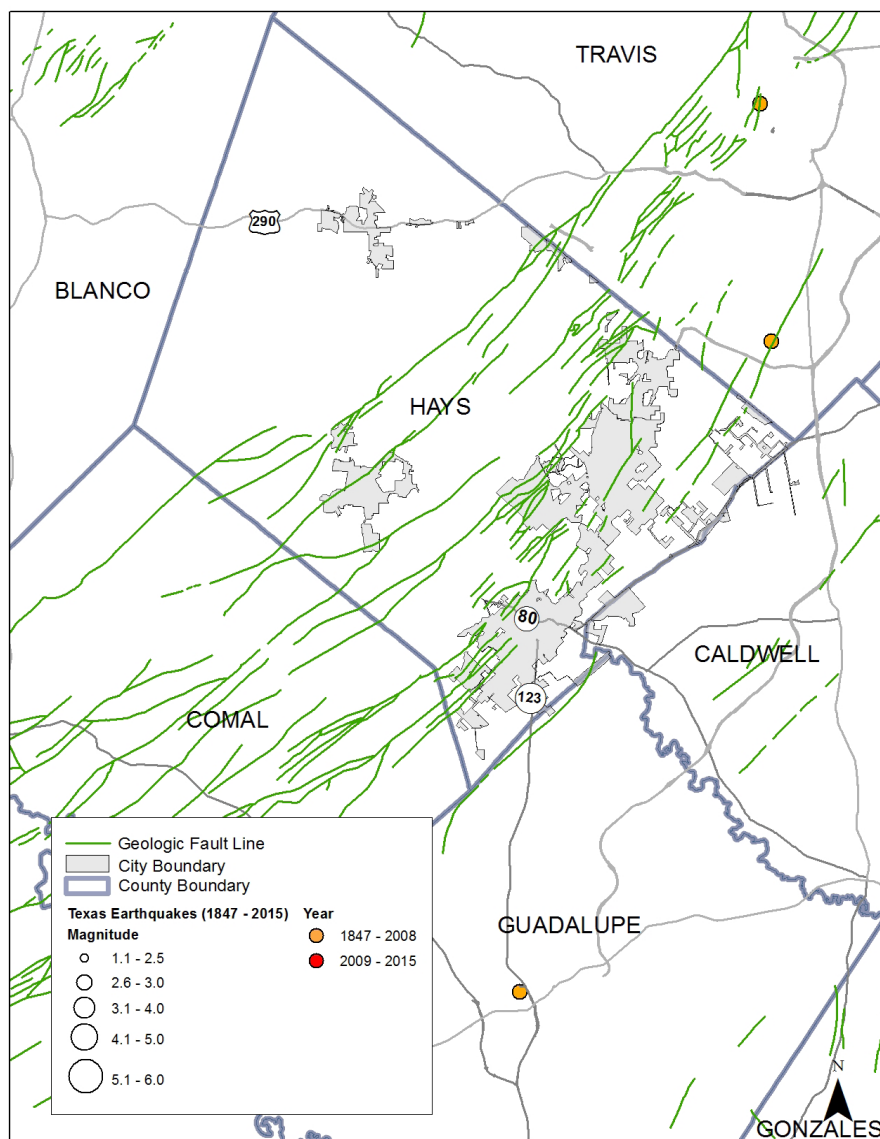
Earthquakes



Earthquakes: Location

Locations within proximity to fault lines are typically the areas most at risk for earthquakes. Figure HC.5 shows USGS documented fault lines and the locations of earthquakes from 1847 to 2015 in relation to Hays County.

Figure HC.5, Texas Earthquakes, 1847 – 2015, Hays County



(USGS Earthquake Hazard Program, 2015)

Earthquakes Previous Occurrences

According to USGS 1847-2015 data, there have been no documented earthquake events for Hays County, as illustrated in Figure HC.5.

Earthquakes: Extent and Probability

Earthquakes are measured by Peak Ground Acceleration (PGA). The HAZUS Max PGA for the planning area is 1.58% (see Earthquakes: Impact Section for a description of the HAZUS Analysis). This corresponds to the Modified Mercalli Scale Category IV, with light perceived shaking and no potential structure damage.



HAZUS measures PGA on a census tract level. Cities within more than 1 census tract were assigned the highest PGA level to reflect the maximum possible extent. Refer to Chapter 2, the risk assessment portion of the main plan document, for extent scale and PGA descriptions.

As there have been no recorded previous occurrences of earthquakes for the planning area and the PGA is less than 2% for the area, the probability of an earthquake in the County in the future is low (0 - 1 occurrences in the next 10 years, at up to a 500yr PGA of 1.58%).

Earthquakes: Impact

The FEMA How-To Guidance, Understanding Your Risks (FEMA 386-2, page 1-7), suggests the earthquake hazard should be profiled if the PGA is greater than 3%g, where PGA is measured in the acceleration of gravity (g). The County's PGA is less than 3%g (0.03) and there have been no recorded earthquakes in or near the update area. Therefore, only a minimum level-1 HAZUS analysis was profiled using the 500-year probability event scenario. The HAZUS analysis produced a PGA of 1.58%. HAZUS scenario would produce \$0 in building damages (Residential, Commercial, Agriculture, Religious and Government) from an event. Critical facilities and infrastructure would not experience any loss of service. There would be no critical facilities or infrastructure that would experience moderate to complete damage. No debris would be generated from this event and no people or households would require temporary housing. There would be no moderate, extensive or completely damaged buildings by this event. HAZUS estimates no residents are expected to be displaced from their homes or would require accommodations in temporary public shelters due to the simulated earthquake. Additionally, there would be no casualties or fatalities from this event.

Earthquakes: Vulnerability Summary

While the probability of an earthquake in Hays County is low, with no significant prior events on file, there are fault lines within the community that could cause impact if there were to be an increase in seismic activity in the area. The planning area could expect to be impacted with debris and possible utility interruptions during an unlikely and unprecedented event that exceeds the 500 -year probability event scenario run in HAZUS. If an event of this magnitude were to incapacitate a roadway, emergency responders would be hindered from responding, leaving residents at risk.

The following major thoroughfares are crossed by the USGS fault lines displayed on Figure HC.5: IH-35, SH 80, and SH 123.

Additionally, the following critical facilities, infrastructure other non-critical public facilities are located within 1 mile of a fault line within the community (according to HAZUS and community submitted critical facility data): Road and Bridge Dept./Development Services Dept., Precinct 2 Offices, Road and Bridge Precinct 3, Road and Bridge Supervisor Building, Camp Jacob, Jacobs Well Stewardship Center, Hays High School, Barton Middle School, Impact Center, San Marcos Baptist Academy, St. Stephens Episcopal School, Wonderland School, Live Oak Academy, Jacobs Well Elementary, and Carpenter Hill Elementary.



Pages 26-29, Dam/Levee Failure have been redacted from this copy of the plan.





Pages 26-29, Dam/Levee Failure have been redacted from this copy of the plan.

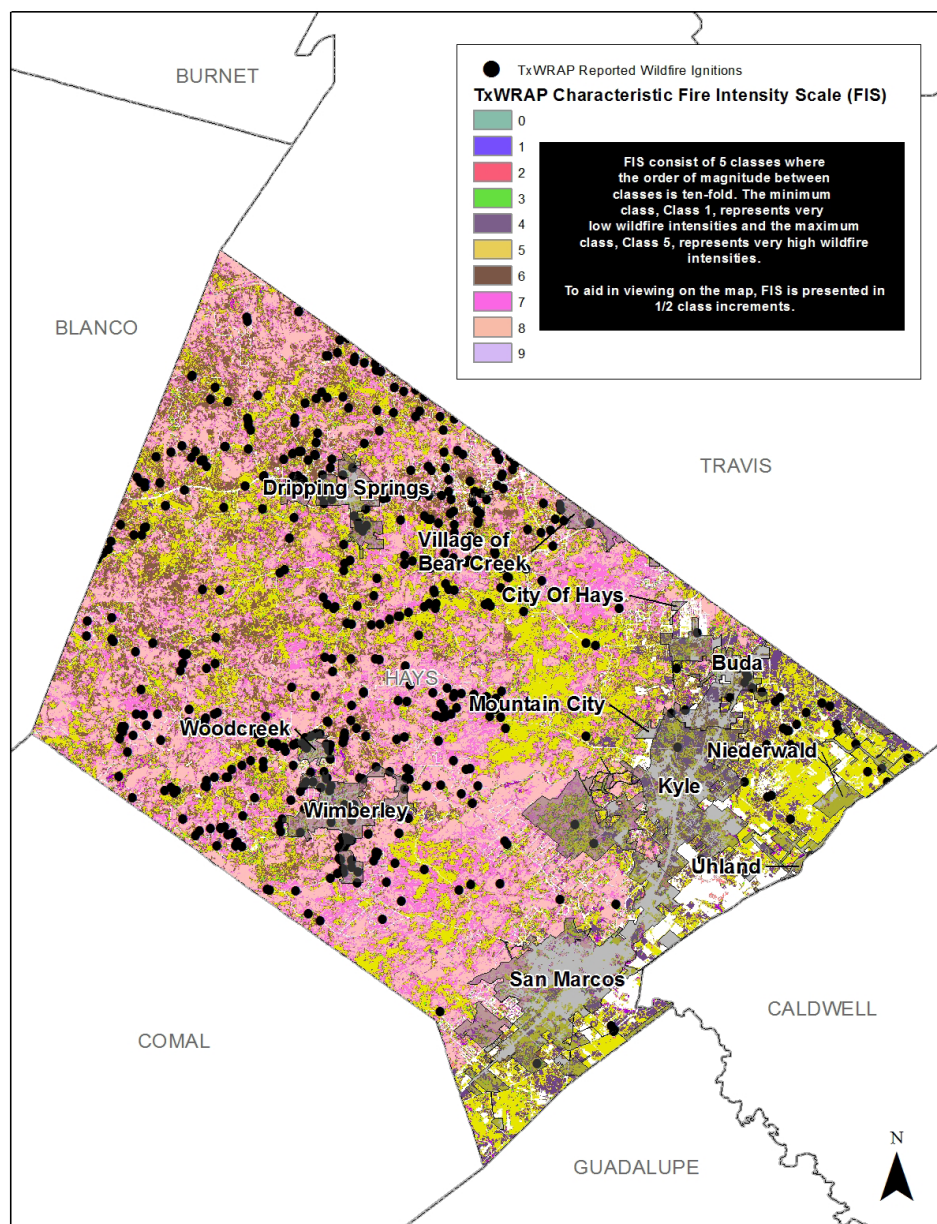


Wildfires

Wildfires: Location

Wildfires can be ignited from a variety of sources including lightning or human activity such as campfires, smoking, arson, or equipment use. The Texas A&M Forest Service's Texas Wildfire Risk Assessment Portal (TxWRAP) can be used to help communities understand their wildfire risk. Figure HC.7 below shows the location of TxWRAP's documented wildfire occurrences with Fire Intensity Scale (FIS) classifications within Hays County. TxWRAP identifies FIS areas as those where wildfire fuels and associated potential dangerous fire behavior exist, based on a weighted average of 4 percentile weather categories.

Figure HC.7, Fire Intensity Scale (FIS) and Reported Wildfire Ignitions, Hays County



(Texas A&M Forest Service, 2016)





Wildfires: Previous Occurrences

Table HC.8 shows the reported wildfire ignitions over 10 acres within the planning area, according to TxWRAP and USGS Federal Fire Occurrence data from the years 1980 to 2015

Table HC.8, Wildfire Ignitions, Hays County

FPA ID	Date	Fire Size (Acres)
SFO-TX02230705-71367	11/30/2005	11
SFO-TX02230706-71464	1/11/2006	11
SFO-TX02240705-5445	7/31/2005	14
SFO-TX01430600-35765173	8/28/2000	15
SFO-TX01440604-3802	12/9/2004	15
SFO-TX02240705-7246	8/20/2005	15
SFO-TX02240707-86745	2/21/2007	15
SFO-TX0482-120778	2/21/2007	15
SFO-TX0482-126613	10/21/2007	15
SFO-TX0482-130379	3/11/2008	15
TFS-TXFD2009-191125	1/8/2009	15
TFS-TXFD2011-353399	10/2/2011	15
SFO-TX0483-72804	1/1/2008	18
TFS-TX2009-75556	8/6/2009	22
SFO-TX02240705-6418	4/17/2005	25
SFO-TX0482-126894	12/4/2007	25
TFS-TX2011-79767	9/2/2011	25
TFS-TX2011-1410263	9/24/2011	25
TFS-TXFD2009-212734	4/22/2009	25
TFS-TXFD2009-212714	6/25/2009	30
SFO-TX02240706-24815	2/2/2006	33
SFO-TX02240705-3729	4/17/2005	40
SFO-TX02240705-6386	3/17/2005	40
SFO-TX0483-72586	10/27/2007	40
SFO-TX0483-72994	1/31/2008	40
TFS-TX2009-75553	8/6/2009	45
SFO-TX0482-130394	2/5/2008	50
TFS-TXFD2011-372451	9/2/2011	50
TFS-TX2009-75550	7/23/2009	55
SFO-TX02240705-4649	7/6/2005	60
SFO-TX02230706-72013	11/15/2006	75
SFO-TX02230706-71518	2/12/2006	79
SFO-TX0483-74311	10/29/2008	80



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Table HC.8, Wildfire Ignitions, Hays County (cont.)

FPA ID	Date	Fire Size (Acres)
SFO-TX0483-74009	7/22/2008	140
SFO-TX01430699-35765306	8/20/1999	230
SFO-TX0483-73023	1/29/2008	230
SFO-TX0483-72718	12/22/2007	241
SFO-TX02230707-72177	2/21/2007	381
TFS-TX2009-75588	7/13/2009	500
SFO-TX0483-73292	3/14/2008	866
SFO-TX02230706-72033	11/15/2006	956
SFO-TX01430601-35766403	8/6/2001	1,175

*N/A - Data not available



Wildfire: Extent and Probability

Table HC.9 lists the Fire Intensity Acreage for the planning area, according to the Texas A&M Forest Service TxWRAP Community Summary Report. Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of the FIS.

Table HC.9, TxWRAP Fire Intensity Acreage, Hays County

Class	Acres	Percent
Non-Burnable	30,756	8.0 %
1 (Very Low)	4,309	1.1 %
1.5	12,138	3.2 %
2 (Low)	6,318	1.6 %
2.5	15,574	4.0 %
3 (Moderate)	95,979	24.9 %
3.5	52,203	13.6 %
4 (High)	69,461	18.0 %
4.5	98,510	25.6 %
5 (Very High)	6	0.0 %
Total	385,254	100.0 %

Based on 382 reported events in 35 years, the Hays County future probability for a wildfire event is approximately 10 to 11 times per year (on average), with up to a potential fire intensity of five, or “Very High” classification on the TxWRAP FIS.





Wildfires: Impact

Impact on the community can be measured using TxWRAP Housing Density levels within the Wildland Urban Interface (WUI). The WUI is characterized as an area where highly vegetative areas intermingle with urban areas with high concentrations of housing and people. Areas with a higher housing and population density would be affected to a greater extent than rural areas, especially in areas near burnable fuels. In the event of a wildfire in high density areas of population, residential structures would be damaged or destroyed, critical infrastructure such as water, sewer and electrical services would be interrupted and residents would experience injury or loss of life. Table HC.10 below lists the population, percent of total population, WUI acreage and percent of WUI acreage for the planning area, according to the Texas A&M Forest Service TxWRAP Community Summary Report.

Table HC.10, WUI Acreage, Hays County

Housing Density	WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
LT 1hs/40ac	1,136	1.7 %	52,705	30.3 %
1hs/40ac to 1hs/20ac	1,631	2.4 %	25,119	14.5 %
1hs/20ac to 1hs/10ac	4,903	7.2 %	32,734	18.8 %
1hs/10ac to 1hs/5ac	10,174	15.0 %	29,586	17.0 %
1hs/5ac to 1hs/2ac	18,063	26.6 %	22,637	13.0 %
1hs/2ac to 3hs/1ac	29,908	44.1 %	10,891	6.3 %
GT 3hs/1ac	2,055	3.0 %	159	0.1 %
Total	67,870	100.0 %	173,831	100.0 %

Wildfires: Vulnerability Summary

The WUI is commonly home to many water and power supply substations and cell towers. Even though there are road systems that, in theory, can serve as fire breaks, there are no other fire breaks in place at present time. With 98,510 acres of unincorporated Hays County classified as a high fire intensity zone, over 25% of the County is vulnerable to wildfires that will burn at one of the highest levels of intensity.

Another vulnerability is the lack of fire hydrants in many mobile home communities, leaving residents and their homes at risk for loss of life or structure. Currently, there is not a Countywide brush clean-up event in place, however many incorporated jurisdictions have dedicated trash vendors that conduct large item pick-up events that can be used to dispose of cut brush and other forms of vegetative fuel.



2.2 Risk Ranking Result

On January 12, 2017, members of the Hays County MPC completed a questionnaire as part of the Hays County HMP Update: Risk Assessment. The questions covered the risk associated with the hazards that affect each community based on the level of concern over each profiled hazard, the hazards' impact on health and safety, as well as impact to property and business continuity. The answers from this questionnaire were combined with public survey results on perception of risk. The values from both sources were analyzed using the Halff Risk Ranking Tool (details regarding the Risk Ranking Tool are in Chapter 2, the risk assessment portion of the main plan document). The results provided a quantified ranking of risk, with values ranging from 0 to 100. The results for Hays County unincorporated areas are shown below (hazard values are shown from highest to lowest risk):

Ranking Order	Hazard	Risk Ranking Value
1	Floods	96.6
2	Expansive Soils	92.4
3	Dam/Levee Failure	92.2
4	Extreme Heat	89.6
5	Severe Winter Storms	87.2
6	Wind Storms	80.3
7	Hail Storms	72.5
8	Lightning	72.4
9	Wildfire	59.6
10	Tornadoes	57.2
11	Drought	43.4
12	Earthquakes	43.2
13	Hurricanes/Tropical Storms	39.3
-	Land Subsidence	Not Profiled



Section 3: Mitigation Strategy

This section examines the community's ability to perform mitigation (a review of existing capabilities is shown in Table HC.11) and identifies specific actions to address vulnerabilities for each hazard profiled in the Hays County HMP Update. The mitigation strategy is the application of actions into an approach for performing structural and non-structural mitigation efforts within the jurisdiction. Actions are also prioritized and considered for incorporation into other community programs, regulations, projects or plans.

Completed and canceled actions are also included in a separate section for future reference.

3.1 Existing Capabilities

Table HC.11, Existing Capabilities

Capability Name	Capability Type	Ability to Expand/Improve
County Judge	Elected Official	Provides political support for approving and funding mitigation actions. Can attend information sessions with County MPC to receive updates on projects when monitoring and evaluation periods are undertaken.
Commissioners		Supplements political support for implementation of mitigation actions. Can attend information sessions with County MPC to receive updates on projects when monitoring and evaluation periods are undertaken.
Emergency Management Coordinator/Emergency Services Director	Contract Staff	Coordinates MPC, implementation of mitigation actions, and monitoring/evaluation/updating HMP. Can attend Mitigation Planning classes offered by Texas Division of Emergency Management if/when planning standards change.
Floodplain Administrator	County Staff	Ensures enforcement of existing flood damage prevention ordinance, and continued compliance with NFIP requirements. Attend advanced floodplain management training.
Civil Engineer	County Staff and Consultants	Provides expertise and guidance for structural mitigation actions. Attend advanced floodplain management training.
Public Works Director	County Staff	Collaborates with MPC on ensuring compliance with existing mitigation-related building requirements and consideration of new building practices to increase mitigation. Attend advanced floodplain management training.
GIS Coordinator		Can graphically demonstrate changes in development and changes in hazard areas. Can track damage data geographically for future risk analysis.
Parks and Recreation Director		Assists in identifying opportunities for integration of mitigation activities into long-term park development plans. Can also assist with coordinating public outreach events. Participate in MPC activities.
Sheriff		Provides staff to assist with flood-related traffic control and evacuation planning. Participate in MPC activities.
Fire Chief		Provides staff to assist with wildfire-related mitigation through existing programs and efforts. Can assist with the implementation of new wildfire mitigation measures through Firewise program.



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Table HC.11, Existing Capabilities, (cont.)

Capability Name	Capability Type	Ability to Expand/Improve
Grants Administrator	County Staff	Pursues and manages grant funding for mitigation projects. Can continue to attend mitigation planning training with Texas Division of Emergency Management in order to learn about possible future changes to planning standards.
The Private Real Property Rights Preservation Act - Subchapter B: Chapter 2007 of the General Government Code	Authority	State-level code that authorizes a “taking” and to regulate construction in an area designated under law as a floodplain.
Texas Senate Bill 936- 77th Legislative Session		State bill that allows counties and general law cities to regulate on the same level as cities are able to. Also allows counties to collect reasonable fees to cover administrative costs incurred by the administration of a local floodplain management program. Also provides for Criminal and Civil Penalties and injunctive relief.
House Bill 1445- 77th Legislative Session-		State bill that provides regulation of subdivisions in Extraterritorial Jurisdictions (ETJ) Authorizes the County to enter into an inter-local agreement to establish floodplain development regulations for plats and subdivisions within the ETJ.
County Property Tax	Funding	Can be leveraged as potential funding for mitigation actions.
FEMA Hazard Mitigation Assistance Grants	Funding	Identify actions that can be funded through new and existing grant awards. Review existing mitigation actions for eligibility for the grant program, to include Benefit Cost consideration. Notify public of intent to apply and receive Commissioner Court approval for application. Prepare grant application documents in advance of grant application periods. Notify public of application submission, with approval of Commissioners Court.
Community Development Block Grant		
TWDB Loan Programs	Funding	Identify actions that can be funded through new and existing loan programs. Review existing mitigation actions for eligibility for the grant program, to include Benefit Cost consideration. Notify public of intent to apply and receive Commissioner Court approval to apply. Prepare loan application documents in advance of loan application periods. Notify public of application submission, with approval of Commissioners Court.

3.2 National Flood Insurance Program Participation

Hays County participates in the National Flood Insurance Program. The program is administered by a highly experienced floodplain administrator (FPA) who also serves as the County Environmental Health Specialist. The FPA is a Certified Floodplain Manager with not only experience in reviewing development permits but also inspecting work sites for adherence to the Flood Damage Prevention Court Order (known as a Floodplain Ordinance at the municipality level) that the County has adopted. The County regulates at higher standards than minimally required by the program and is currently applying for participation in the Community Rating System. The community has a total of 969 NFIP policies in the unincorporated area for a total of \$257,867,200 in insurance coverage.

3.3 Mitigation Goals

The plan-level Mitigation Goals can be found in Chapter 3, the mitigation strategy portion of the main plan document. These goals were mutually decided upon by the MPC as the guiding goals for the development of actions in each planning area.

3.4 Mitigation Actions

Risk focus is defined as:

*E= Actions reducing risk to existing buildings and infrastructure

*F= Actions reducing risk to new development and redevelopment

Number/Title	Hazard	Item Description	Implementation Agency	
1 Flood Insurance Information Campaign (previously action 2 in 2011 plan, modified)	Floods	Promote the flood insurance program to lessen the number of structures uninsured from flood loss by providing citizens access to brochures about the NFIP at the County Government Center and adding links to resources on the County website.	Hays County Floodplain Administration	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing County staff and free NFIP materials from FEMA publication warehouse		3 months	Not started	N/A
Cost and Benefit Considerations				
This project would indirectly benefit residents who need information about the hazard, at little cost.				

Number/Title	Hazard	Item Description	Implementation Agency	
2 Attend Advanced Local Floodplain Management Courses (previous action 19 in 2011 plan, modified)	Floods	Send members of the staff or elected official to training in order to receive advanced training modules in floodplain administration.	Hays County Floodplain Administration	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$250/Existing Staff/ In-Kind Services, cost of accommodations for FEMA session		6 months	Not started	E/F
Cost and Benefit Considerations				
If attending the course at the Emergency Management Institute, the cost of the course would be very low, and only include a minimal meal ticket purchase. The benefit of an informed floodplain administrator would help to inform both new and existing residents through guidance on how to mitigate flood damages to development.				



Hays County Hazard Mitigation Plan, Hays County Annex

Number/Title	Hazard	Item Description	Implementation Agency	
3 Upgrade to Interoperability and Safety Band (previously action 4 in 2011 plan)	Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Floods, Hurricanes/Tropical Storms, Earthquakes, Dam/Levee Failure, Wildfires	Upgrade existing County public safety radio bands in order to ensure interoperability with other entities during large scale events and operations.	Hays County Office of Emergency Services	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$1.7 Million/In-Kind Contribution/Special Project Funds/Federal Grants		12 months	Not started	N/A
Cost and Benefit Considerations				
The benefits of interoperability of radio communication during disaster events would benefit all responders and citizens/tourists in the community.				

Number/Title	Hazard	Item Description	Implementation Agency	
4 StormReady Designation for Hays County (previously action 14 in 2011 plan)	Windstorm, Hailstorm, Severe Winter Storms, Lightning, Hurricanes/ Tropical Storms, Tornadoes, Floods	Application preparation and submission for StormReady designation from the National Weather Service that attests to the community’s level of preparedness for severe weather.	Hays County Office of Emergency Services	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services		12 months	Ongoing. SkyWarn training offered annually.	N/A
Cost and Benefit Considerations				
This free application would benefit all members of the unincorporated area in increasing the preparedness of the local government.				

Number/Title	Hazard	Item Description	Implementation Agency	
5 Increase Public Awareness of Hazard Mitigation	Drought, Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Expansive Soils, Floods, Hurricanes/Tropical Storms, Earthquakes, Dam/Levee Failure, Wildfires	Increasing public awareness of natural hazards and hazardous areas; distributing public awareness information regarding hazards and potential mitigation measures. Promotional sources would include County website, social media and public education programs. Provide mitigation outreach through HaysInformed.com.	Hays County Office of Emergency Services	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services		6 months	Ongoing	N/A
Cost and Benefit Considerations				
This enhancement to the County’s existing emergency management and preparedness website with mitigation information would benefit all with internet access at little to no cost, except the staff resources required to do so.				



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Number/Title	Hazard	Item Description	Implementation Agency	
6 Continue to Promote Firewise (previously actions 23 & 24 in 2011 plan, modified)	Wildfire	Continuation of activities for purposes of mitigating wildfire risk and planning activities for adding neighborhoods into the Firewise program.	Hays County Fire Marshal	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services		12 months	Ongoing	E/F
Cost and Benefit Considerations				
Continuation of program that is already being implemented and is supported through County funds, in order to register more neighborhoods into the program.				

Number/Title	Hazard	Item Description	Implementation Agency	
7 Monitor Drought conditions (previously 16 in 2011 plan, modified)	Drought	Use HaysInformed.com to provide links to National Drought Monitor for daily drought report availability for the public.	Hays County Office of Emergency Services	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services		6 months	Ongoing	N/A
Cost and Benefit Considerations				
This project that will promote awareness and visibility on drought trends and occurrences at no cost.				

Number/Title	Hazard	Item Description	Implementation Agency	
8 Installation of Mitigation Features for New Public Facilities to Ensure Soundness against Natural Hazards (previously action 27 in 2011 plan, modified)	Drought, Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Expansive Soils, Floods, Hurricanes/Tropical Storms, Earthquakes, Dam/Levee Failure, Wildfires	Ensure new structures are structurally reinforced against natural hazards. To include, low-flow water units for drought, flood-proofing (if needed), wind resistant doors and windows, freeboard, bracing and bolting of sill plates, higher levels of soil compaction and proper perimeter drainage systems, impact resistant films for glass, foundation supports, increased insulation and grounding systems.	Hays County Development Services	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
TBD / General Fund / In-kind Services		Undetermined	Not started	F
Cost and Benefit Considerations				
Cost-effectiveness will vary with level of risk and project cost.				



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Number/Title	Hazard	Item Description	Implementation Agency	
9 Evacuation Plans/ Alternate Road Consideration (previously action 29 in 2011 plan, modified)	Hurricanes/ Tropical Storms, Floods, Dam/ Levee Failure, Wildfire	Documentation of an evacuation plan that includes multiple exits. Possible construction of new roads to provide alternate routes for evacuation for areas that have limited or hazardous points of ingress/egress.	Hays County Office of Emergency Services	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services, possible cost of buy-out for an easement of land, pursuit of grant funding for effort		18 months	Ongoing	N/A
Cost and Benefit Considerations				
The cost of not establishing safe evacuation routes in the community would greatly outweigh the cost of mitigating this risk to life safety.				

Number/Title	Hazard	Item Description	Implementation Agency	
10 Expansive Soil Mitigation Measures Training	Expansive Soils	Creating and providing an information sheet regarding expansive soils in the development permit packet given to developers and citizens building in the community. The sheet will provide risk information about the hazard and provide recommendations for soil compaction and engineered foundations, especially for non-site built structures.	Hays County Development Services	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services, \$100 cost of printing		3 months	Not started	F
Cost and Benefit Considerations				
This effort would provide awareness and public information that will benefit those looking to perform new development and those who are improving or repairing existing property.				

Number/Title	Hazard	Item Description	Implementation Agency	
11 Dam Inundation Maps (previously action 31 in 2011 plan, modified)	Dam/Levee Failure, Floods	Work with TCEQ to continue to develop inundation maps for all High Hazard dams.	Hays Floodplain Administration	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Flood Protection Planning efforts currently in progress, as well as contractual services		12 months	Phase 1 Completed and Being Continued	N/A
Cost and Benefit Considerations				
This would benefit the community members that are downstream or within the outfall of dams. This would allow for visibility of hazard areas that may require mitigation but that are not regulated as Special Flood Hazard Areas, allowing for mitigation development standards where they otherwise may not be enforced.				



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Number/Title	Hazard	Item Description	Implementation Agency	
12 Equipping Critical Buildings (beyond fire departments) with Back-up Generators (previously actions 6 & 18 in 2011 plan, modified)	Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Floods, Hurricanes/ Tropical Storms, Earthquakes, Dam/ Levee Failure, Wildfires	Continuing the purchase and installation of emergency generators for back-up power at critical buildings in Hays County.	Hays County Office of Emergency Services	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services, grant writing assistance, Hazard Mitigation Grant program funding, if applicable and eligible. Equipment estimated at \$10,000 - \$25,000 dependent on facility size and needs.		24 months	Not started	E/F
Cost and Benefit Considerations				
This is an ongoing project that started in the previously planning period for fire stations and has been beneficial to the community. The pursuit of grant funding to support this effort would ensure the continuance of this effort. Generators are currently an applicable project for HMGP. The benefit cost requirements are likely to be achievable.				
Number/Title	Hazard	Item Description	Implementation Agency	
13 Acquisition or Elevation of Repetitive Loss Structures (previously action 10 in 2011 plan)	Floods	Action to mitigate 38 identified properties with a total of 88 losses claimed for a total of \$4 million from the NFIP.	Hays County Grants Administrator, Emergency Management Coordinator, Floodplain Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Using Current 2016 Assessment records for these 38 properties, it is estimated the average acquisition cost (to include all related costs of acquisition and demolition) is \$400,000, for a total estimated cost of just over \$15M. The estimated cost to elevate these homes, using the square footage of the homes from the 2016 Assessment records, and using \$75/square foot of linear footprint, is \$6.4M. Funding Sources: FEMA, TDEM, TWDB, GLO, Hays County		Delayed	Ongoing	E
Cost and Benefit Considerations				
Cost effectiveness for these acquisitions or elevations are determined on a per structure or project basis.				
Number/Title	Hazard	Item Description	Implementation Agency	
14 Additional Stream & Rain Gauge and Flood Warning Systems (previously action 15 in 2011 plan, modified)	Floods, Dam/ Levee Failure	Next phase in an ongoing effort to increase the number of gages along high velocity flood areas and flood warnings at High Hazard Dams.	Hays County Office of Emergency Services	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Hays County Office of Emergency Services		48 months	Ongoing	N/A
Cost and Benefit Considerations				
This action is a collaborative effort with the Texas Water Development Board. The costs to the community would be reduced through assistance from this State entity. The benefit would be preservation of life and property throughout the County and incorporated areas.				



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Number/Title	Hazard	Item Description	Implementation Agency	
15 Community Rating System (CRS) Application and Community Rating System Benefit Report for Jurisdictions (previously action 20 in 2011 plan, modified)	Floods	The County will pursue a CRS rating in order to provide discounts to flood policy holders. With varying levels of benefit from CRS program insurance premium discount benefits at the incorporated jurisdiction level, the benefit/cost of the administration of a CRS application and program may cost a jurisdiction more than it saves them. A County-coordinated assessment of the number of policies that are in the SFHA in the communities, with a listing of their potential for savings would assist with determining if they would benefit from participation.	Hays County Floodplain Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services with FEMA/TWDB support		12 months	Ongoing	N/A
Cost and Benefit Considerations				
This action would help determine which incorporated communities would benefit from completing the application for CRS. The cost-savings to the members of the communities would be directly related to the number of policies and cost of flood insurance premiums.				

Number/Title	Hazard	Item Description	Implementation Agency	
16 Continue to Improve Emergency Warning Capabilities (previously action 3 in 2011 plan, modified)	Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Floods, Hurricanes/Tropical Storms, Earthquakes, Dam/Levee Failure, Wildfires	Research and possible implementation of systems for redundancy in notifications through use of AM/FM radio and satellites.	Hays County Office of Emergency Services	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services until appropriate measures are identified		12 months	Ongoing	N/A
Cost and Benefit Considerations				
Not independently cost-effective but critical for life safety.				



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Number/Title	Hazard	Item Description	Implementation Agency	
17 Minimize the Loss of Life at Low Water Crossings (previously action 22 in 2011 plan, modified)	Floods	Continue efforts to improve and expand upon existing low water crossing alert systems, and road blocking systems. Also make structural improvements to low water crossings to decrease vulnerability and protect residents.	Hays County Office of Emergency Services	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$500,000/ State and Federal Grants		48 months	Ongoing	E/F
Cost and Benefit Considerations				
Not independently cost-effective but critical for saving lives.				

Number/Title	Hazard	Item Description	Implementation Agency	
18 Fuel Reduction Project	Wildfires	Identify and complete a vegetative fuel reduction project in order to lessen the risk of wildfire, in addition to existing Firewise planned activities.	Hays County Office of Emergency Services	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services until project identified and cost determined		12 months	Ongoing	N/A
Cost and Benefit Considerations				
Possible low-cost solutions to reducing loss of life and property adjacent to WUI.				

Number/Title	Hazard	Item Description	Implementation Agency	
19 Construct Needed Water System Improvements in Lower Colorado Region K and South Central Region L	Drought	Construction of projects needed to improve the water system in 2 regions.	Hays County Commissioners Court	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$472 Million (South Central Texas Region- 21 counties) \$256 million (14 County Lower Colorado Region), Funding sources: TWDB, GBRA, LCRA		48 months	Plan complete, pending project completion	E/F
Cost and Benefit Considerations				
Solutions will be cost-effective, as required by grant funding.				



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Number/Title	Hazard	Item Description	Implementation Agency	
20 Drainage Project along Willow Springs Creek between McCarty Lane and Hunter Road	Flood	Channel improvement and/or property acquisition project to reduce flood damages along Willow Springs Creek from McCarty Lane to Hunter Road.	Hays County Development Services	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$8 Million (TBD through further analysis)/Funding sources: HMA Grants and General Fund/In-Kind Contribution for Local Share		36 months	Application in progress	E/F
Cost and Benefit Considerations				
Solutions will be cost-effective, as required by grant funding. This project will benefit numerous residential structures and reduce loss of property and life from flooding.				
Number/Title	Hazard	Item Description	Implementation Agency	
21 Drainage Project along Willow Springs Creek between Hunter Rd and the Railroad	Flood	Detention project to reduce flood damages along Willow Springs Creek from Hunter Road to the railroad.	Hays County Development Services	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$12 Million (TBD through further analysis)/Funding sources: HMA Grants and General Fund/In-Kind Contribution for Local Share		36 months	Application in progress	E/F
Cost and Benefit Considerations				
Solutions will be cost-effective, as required by grant funding. This project will mitigate flooding for numerous commercial and residential structures. Critical facilities and vulnerable populations will also benefit from this project.				
Number/Title	Hazard	Item Description	Implementation Agency	
22 Property Acquisition in Southeastern Hays County	Flood	Property acquisition project to mitigate repetitive loss flooding where drainage projects were analyzed and deemed ineffective for cost/benefit reasons.	Hays County Development Services	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$8 Million (TBD through further analysis)/Funding sources: HMA Grants and General Fund/In-Kind Contribution for Local Share		36 months	Application in progress	E/F
Cost and Benefit Considerations				
Solutions will be cost-effective, as required by grant funding. Numerous residents will be removed from the flood risk area in areas of Repetitive Loss.				

3.5 Capabilities Assessment

Evaluation/Prioritization of Actions

Each action added to the plan was developed using the Mitigation Action Summary Worksheet shown in Figure HC.8.

Figure HC.8, Mitigation Action Summary Worksheet

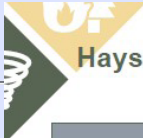


Hays County Hazard Mitigation Plan Update Process
Mitigation Action Summary Worksheet

Community Name:

Person completing questionnaire:

Mitigation Action/ Project Title	
Background/ Issue	
Opportunities for Integration	
Responsible Agency	
Partners	
Strategy for Existing Structures	



Hays County Hazard Mitigation Plan Update Process
Mitigation Action Summary Worksheet

Strategy for Future Development	
Potential Funding	
Cost Estimate (Values from "Measuring Costs" fields from Benefit and Cost Review Worksheet)	
Benefits (Statements from the "Difference" fields on the Benefit and Cost Review Worksheet)	
Timeline	
Priority (Based off Priority worksheet)	



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Table HC.12, Mitigation Action Prioritization (with Hazards in order of highest priority to lowest)

Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community	Risk Ranking Score	Total Score
9. Evacuation Plans/Alternate road consideration	1	1	1	1	1	1	1	1	1	1	97	107
19. Construct Needed Water System Improvements in Lower Colorado Region K and South Central Region L	1	1	1	1	1	1	1	1	1	1	97	107
5. Increase Public Awareness of Hazard Mitigation	1	1	1	1	0	1	1	1	0	1	97	105
20. Drainage Project Willow Springs (McCarty/Hunter Rd)	1	1	1	1	0	0	0	1	1	1	97	104
21. Drainage Project Willow Springs (Hunter Rd/Railroad)	1	1	1	1	0	0	0	1	1	1	97	104
22. Property Acquisition Southeastern Hays	1	1	1	1	0	1	-1	1	1	1	97	104
16. Improve Emergency Warning Capabilities	1	0	1	1	0	0	1	1	1	1	97	104
13. Acquisition or elevation of Repetitive Loss Structures within Hays County planning area	1	1	1	0	1	1	0	1	1	0	97	104
17. Minimize the risk of life at low water crossings in Hays County	1	0	1	1	0	0	1	1	1	1	97	104
2. Attend Advanced Local Floodplain Management Courses	1	1	1	1	1	1	0	1	0	0	97	104
3. Upgrade to Interoperability and Safety Band	1	0	1	1	1	0	1	1	0	1	97	104
11. Dam Inundation Maps	1	1	1	0	1	0	1	1	0	1	97	104
18. Additional Stream & Rain Gauge and Flood Warning Systems	1	0	1	1	0	0	1	1	1	1	97	104
8. Installation of Mitigation Features for New Public Facilities to Ensure Soundness against Natural Hazards	1	1	1	-1	0	1	1	1	0	1	97	103
19. CRS Application for County and Benefit Cost Study for CRS Participation for Incorporated Communities	1	1	1	1	1	0	1	-1	0	1	97	103
1. Flood Insurance Information Campaign	0	0	1	1	0	0	1	1	0	0	97	101
12. Equipping Critical Buildings (beyond fire departments) in Hays County with backup generators	1	0	1	1	1	0	1	1	0	1	92	99
4. StormReady Designation for Hays County	1	0	1	1	0	0	1	1	0	1	92	98
7. Monitor Drought Conditions	1	0	1	1	0	1	1	1	1	1	80	88
6. Continue to Promote Firewise	1	1	1	1	1	0	1	1	1	1	60	69
18. Fuel Reduction Project	1	1	1	1	0	0	1	1	1	1	60	68
10. Expansive Soil Information Sheet	0	1	1	-1	0	0	1	-1	0	0	43	44



Mitigation Actions by Hazard

The mitigation actions are shown with corresponding hazards in Table HC.13 below.

Table HC.13, Mitigation Action Impact, Hays County Unincorporated

Action Number	Drought	Extreme Heat	Severe Winter Storms	Lightning	Hailstorms	Windstorms	Tornadoes	Expansive Soils	Floods	Land Subsidence	Hurricanes/Tropical Storms	Earthquakes	Dam/ Levee Failure	Wildfire
1									X					
2									X					
3		X	X	X	X	X	X		X		X	X	X	X
4			X	X	X	X	X		X		X			
5	X	X	X	X	X	X	X	X	X		X	X	X	X
6														X
7	X													
8	X	X	X	X	X	X	X	X	X		X	X	X	X
9									X		X		X	X
10								X						
11									X				X	
12		X	X	X	X	X	X				X	X	X	X
13									X					
14									X				X	
15									X					
16	X	X	X	X	X	X	X		X		X	X	X	X
17									X					
18														X
19	X								X					
20									X					
21									X					
22									X					



3.6 Integration Efforts

Table HC.14 captures ways that the HMP risk assessment, mitigation goals and actions can be integrated into other Hays County documents, programs and regulations

Table HC.14, Plan Integration Efforts, Hays County

Name of Document	Type	Item Type	Process for Integration
Public Awareness Hazard Webpages	Website	Action	Each community participating in the Hays County HMP Update will coordinate with website coordinators to create Public Awareness pages on their City/Village websites. HaysInformed.com could link to those hazard pages to guide page visitors to pages relevant to their own community.
Community Development Block Grants	Funding	Action	Once Benefit Cost analysis is done for flood mitigation structural actions, the County can determine if it will apply to utilize any Hazard Mitigation Grant Program funding. Once approval is obtained by County Commissioners Court, cost-shares can be applied using CDBG funding for those low- to moderate income neighborhoods/households that would qualify for such assistance.
Hays County Strategic Policy and Implementation Plan 2010	Plan	Goals	MPC members can seek seats on the update committee for this plan so mitigation and public safety can remain a high priority in future policy decision making.
Property Assessed Clean Energy (PACE) Program Proposed for Hays County	Plan	Risk Assessments	Ensure that funding that is pursued under PACE program is not being used to improve structures that are non-compliant in the floodplain by conducting flood insurance rate map reviews through the County Floodplain Administrator's office.
Jacob's Well Natural Area Master Plan	Plan	Goals	Seek to further enhance the educational programs and tours at the park to provide visitors with insight on mitigation. Consider posting high water marker signs in the park.
Hazard Mitigation Grant Program (HMGP)	Funding	Action	Identify actions that can be funded through new and existing grant awards. Review existing mitigation actions for eligibility for the grant program, to include Benefit Cost consideration. Prepare grant application documents in advance to prepare for future grant application periods. Process involves identification of actions from Plan; obtaining Commissioner Court approval to apply; notification of interest in grant to the public; completion of application for funding; if awarded, obtaining Commissioner Court approval to accept; if accepted, administration of funds and implementation of project.
Pre-Disaster Mitigation (PDM)			
Flood Mitigation Assistance (FMA)			
TWDB Flood Protection Planning (FPP) Grant			



Table HC.14, Plan Integration Efforts, Hays County

Name of Document	Type	Item Type	Process for Integration
TWDB Clean Water State Revolving Fund (CWSRF)	Funding	Action	Identify actions that can be funded through new and existing loan programs. Review existing mitigation actions for eligibility for the grant program, to include Benefit Cost consideration. Prepare loan application documents in advance to prepare for future loan application periods.
Texas Water Development Fund (DFund)			Process involves obtaining Commissioner Court approval to apply; notification of interest in loan to the public; completion of application for loan; if awarded, obtaining Commissioner Court approval to accept; if accepted, administration of funds and implementation of project.

Incorporation Achievements Since Previous Plan Update

Hays County incorporated the HMP into other planning mechanisms as a demonstration of progress in local hazard mitigation efforts. This was achieved by identifying MPC planners and or stakeholders to participate in the Jacob’s Well Natural Area Master Plan creation.



Section 4: Finalize Plan Update (Review, Evaluation, and Implementation)

4.1 Changes in Development

Hays County is known nationally for its growing population and industry. With these changes, there have been great expansions of Extra-Territorial Jurisdictions, as community boundary lines continue to change and expand. According to Texas Demographic Center estimates, within the “Total Populations of Counties and Places in Texas” for July 1st 2015 and January 1, 2016, Hays County experienced a 26.9 % change between 2010 and 2016 (Texas Demographic Center, 2017). While infrastructure and government services expand to meet the demands of growth, vulnerability may increase. However, the renovation of older structures and development of new facilities built with resiliency standards will decrease vulnerability once projects are completed.

4.2 Progress in Mitigation Efforts

Past Mitigation Action Progress Reports Summary - Completed and Canceled

2011 Action Number	Hazard	Item Description	Lead Department
1	Flood	Increase the number of Hays County communities that participate in the NFIP	Hays County OES and FPM
Cost Estimate/Funding		Schedule	Status as of 2017
Cost and Funding: Existing Staff/ In-Kind Services resources, no cost		Completed	Completed
Cost Effectiveness			
Not independently cost-effective			

2011 Action Number	Hazard	Item Description	Lead Department
5	Flood	Minimize the risk of loss of life at low water crossings in Hays County(Phase 1 warning sign and barricades) (Phase 2- Rescue Fee)	OES and FPM
Cost Estimate/Funding		Schedule	Status as of 2017
\$12,000 Annually and \$2,000 per maintenance cost		Completed	Phase 1 complete. Phase 2 canceled, as it is not an approach the County wants to take.
Cost Effectiveness			
Not independently cost-effective but critical for reducing loss of life and injuries at low water crossings			

2011 Action Number	Hazard	Item Description	Lead Department
7	Tornado	Encourage Construction of Tornado “Safe Rooms”	OES
Cost Estimate/Funding		Schedule	Status as of 2017
Funding: Texas DEM, FEMA		Ongoing	Canceled. Not feasible.
Cost Effectiveness			
Not independently cost-effective			



Hays County Hazard Mitigation Plan, Hays County Annex

2011 Action Number	Hazard	Item Description	Lead Department
8	Text	Increase Hays County OEM Staff	OES
Cost Estimate/Funding		Schedule	Status as of 2017
\$50,000 per year salary and equipment- Hays County Funding: FEMA, Texas DEM, Hays County		Completed	Completed, additional staff added to support Emergency Services.
Cost Effectiveness			
Not independently cost-effective			

2011 Action Number	Hazard	Item Description	Lead Department
9	All hazard	Development of and maintenance of Countywide and individual community HAZMAP Plans	OES
Cost Estimate/Funding		Schedule	Status as of 2017
Existing Staff/ In-Kind Services resources		Original Plan adopted on 4/20/2004. Update in 2011	Completed.
Cost Effectiveness			
Not independently cost-effective			

2011 Action Number	Hazard	Item Description	Lead Department
11	Tornado, Flood	Building Code Improvements	Hays County Development Services Department
Cost Estimate/Funding		Schedule	Status as of 2017
Funding: Texas DEM, CAPCOG, Hays County		Evaluation in 2006 Code updates, phased, ongoing	Canceled. Hays County has no building codes (limitations on regulation from Texas Government Code).
Cost Effectiveness			
Not independently cost-effective			

2011 Action Number	Hazard	Item Description	Lead Department
12	Flood	Adopt "Higher Standard" Flood Damage Prevention Ordinances	FPM
Cost Estimate/Funding		Schedule	Status as of 2017
Cost and Funding: Existing Staff/ In-Kind Services resources, no cost		A higher standard Flood Damage Prevention Order was adopted in 2009. More restrictive ordinance anticipated in 2011.	Completed in August of 2011.
Cost Effectiveness			
Not independently cost-effective			



Hays County Hazard Mitigation Plan, Hays County Annex

2011 Action Number	Hazard	Item Description	Lead Department
13	Hazardous Materials	Designate HAZMAT Cargo Routes in Hays County	Local Emergency Planning Committee
Cost Estimate/Funding		Schedule	Status as of 2017
\$3000 estimated study cost, \$5000 estimated cost to placard selected roadways Funding Sources: Texas DOT, Texas DEM, Hays County		2011 to 2015	Removed. This action is not focused on Natural Hazards, but is still being conducted at a regional level.
Cost Effectiveness			
Not independently cost-effective			

2011 Action Number	Hazard	Item Description	Lead Department
18	Flood	Update Hays County FIS and FIRM	FPM
Cost Estimate/Funding		Schedule	Status as of 2017
Funding: FEMA Funded Flood Insurance Study, USACE Onion Creek Federal Flood Protection Project		2006-2007	Completed detailed studies to improve flood data for Hays County.
Cost Effectiveness			
Not independently cost-effective but critical to update aging flood hazard maps			

2011 Action Number	Hazard	Item Description	Lead Department
21	Extreme Heat	Reduce Impacts of Extreme Heat on Elderly, Disabled, Low-Income and Infants (Fan Distribution Program)	OES
Cost Estimate/Funding		Schedule	Status as of 2017
\$2,000 to purchase and distribute 100 box fans and \$3,000 estimated cost for a/c repairs Funding Sources: United Way, Rotary Clubs, Lion Clubs, Red Cross, Churches and charitable organizations, power companies		Completed	Canceled. Not feasible for the County to achieve.
Cost Effectiveness			
Not independently cost-effective			

2011 Action Number	Hazard	Item Description	Lead Department
25	Extreme Heat	Evaluate Excess Heat Risks Study	OES, Hays County Health
Cost Estimate/Funding		Schedule	Status as of 2017
No additional cost-uses Existing Staff/ In-Kind Services resources		TBD: Probably initiated in 2011	Canceled. Replaced with other extreme heat actions.
Cost Effectiveness			
Not independently cost-effective, but needed to develop adequate risk reduction efforts			



2011 Action Number	Hazard	Item Description	Lead Department
28	Dam Failure	Understanding Dam Failure Risks Group formation	OES
Cost Estimate/Funding		Schedule	Status as of 2017
No additional cost-uses Existing Staff/ In-Kind Services resources		Initiated in 2011 then ongoing	Canceled. Replaced with other Dam Failure actions.
Cost Effectiveness			
Not independently cost-effective			

4.3 Changes in Priorities

Plan-level priority changes are shown in Chapter 3 (mitigation strategy within the main plan document), within an overview of the plan goals and how they changed with the 2018 update. Such changes include the removal of a goal that addressed man-made hazards and the addition of one that promotes the County's water conservation efforts. The heart of Flash Flood Alley, Hays County priorities remain highly fixed on the dangers and impacts of floods in the County. Since the last planning period, the priorities have remained consistent to continue to protect life and property in Hays County.





Section 5: Approval and Adoption

5.1 Approval and Adoption Procedure

The procedures for approval and adoption are described in Chapter 4.1 of the main plan document.

Table HC.15, County Adoption Date

Municipality	APA Date	Adoption Date
Hays County		

Jurisdiction Adoption Documentation Placeholder

References

- Griffith Mosely Johnson & Associates. (2016, 03 22). Hays County: Plans, Policies and Reports. Retrieved from Hays County Criminal Justice System Update and Jail Facility Assessment: <http://www.co.hays.tx.us/SharedFiles/Download.aspx?pageid=256&mid=290&fileid=6488>
- Hays County . (2015, 12 15). Plans, Policies and Reports. Retrieved from Hays County FM 150 West Character Plan: <http://www.co.hays.tx.us/SharedFiles/Download.aspx?pageid=256&mid=290&fileid=6488>
- Hays County. (2010). Hays County Strategic Policy and Implementation Plan. San Marcos: Hays County, TX.
- HDR Engineering, Inc. (2011, 02). Hays County: Plans, Policies and Reports Documents. Retrieved from Water and Wastewater Facilities Plan for the Portion of Hays County West of the IH-35 Corridor: <http://www.co.hays.tx.us/SharedFiles/Download.aspx?pageid=256&mid=290&fileid=5014>
- MacCormack, Z. (2017, 03 24). Folks flocking to area Counties: Kendall, Comal, and Hays are on the top 10 list. San Antonio Express-News, pp. pp. 1, A11.
- National Fire Protection Association. (2013, June). NFPA News & Research. Retrieved from Lightning Fires and Lightning Strikes: <http://www.nfpa.org/news-and-research/fire-statistics-and-reports/fire-statistics/fire-causes/lightning-fires-and-lightning-strikes>
- National Highway Traffic Safety Administration. (2017, 03 11). Traffic Safety Facts. Retrieved from Texas 2011-2015: <https://cdan.nhtsa.gov/SASStoredProcess/guest>
- National Oceanic and Atmospheric Administration. (2016). Historical Hurricane Tracks. Retrieved from National Oceanic and Atmospheric Administration Coastal Management: <https://coast.noaa.gov/hurricanes/>
- National Oceanic and Atmospheric Administration Storm Event Database. (2016, 12 01). National Centers for Environmental Information. Retrieved from Data Access: <https://www.ncdc.noaa.gov/data-access>
- RVi Planning + Landscape Architecture. (2012, 07 31). Hays County: Plans, Policies and Reports. Retrieved from Jacob's Well Natural Area Master Plan: <http://www.co.hays.tx.us/SharedFiles/Download.aspx?pageid=258&mid=295&fileid=625>
- Sedgwick LLP. (2013, 07 09). Hays County: Plans, Policies and Documents. Retrieved from Hays County Regional Habitat Conservation Plan: Presentation to Commissioners Court: <http://www.co.hays.tx.us/SharedFiles/Download.aspx?pageid=256&mid=290&fileid=3122>
- Texas A&M Forest Service. (2016, 12 01). Wildfire Risk Assessment Portal. Retrieved from Public Viewer: <https://www.texaswildfirerisk.com/>
- Texas Demographic Center. (2017, 04 21). Texas Demographic Center. Retrieved from Data: Population Estimates Program: http://demographics.texas.gov/Resources/TPEPP/Estimates/2015/2015_txpoest_County.pdf
- Texas Natural Resources Information System. (2011). TNRIS Data Catalog Low Water Crossings. Retrieved from TNRIS: <https://tnris.org/data-catalog>
- Tornado Facts. (2016, 03 16). Tornado Facts and Information . Retrieved from Tornado Scale: <http://www.tornadofacts.net/tornado-scale.php>
- USGS Earthquake Hazard Program. (2015). USGS Earthquake Hazard Program. Retrieved from USGS: <https://earthquake.usgs.gov/data/>



Village of Bear Creek Hays County Hazard Mitigation Plan Update

2018



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Village of Bear Creek Annex

Section 1: Organize and Review

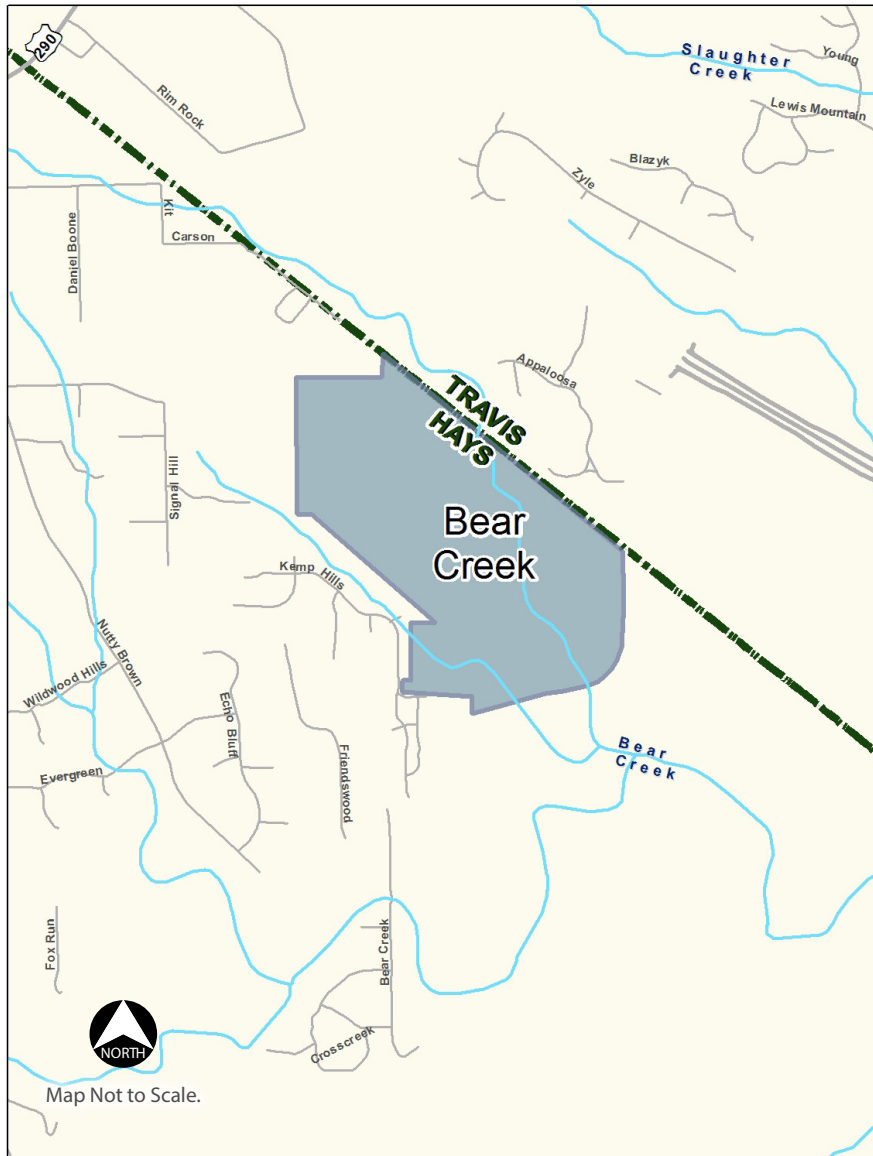
This section contains a brief description of the Village of Bear Creek and its jurisdictional features. In addition, Section 1 contains the following details regarding Bear Creek's:

- participation in the Hays County HMP Update process,
- stakeholder engagement,
- public outreach strategy,
- incorporation efforts, and
- plan maintenance procedures.

*Population :	369
Size of Community:	1.15 sq. miles
*Population over 65 years old	25
*Population under 16 years old	95
*Economically Disadvantaged Population (\$0-\$20k)	2
Village of Bear Creek is serviced by the following responders:	
Fire - North Hays Fire/Rescue	
EMS - San Marcos Hays County EMS	
Law Enforcement - Hays County Sheriff's Office	

HAZUS-MH 3.2 Updated Census 2010 Population Estimates

Figure BC.1, Village of Bear Creek



1.1 Community Description

When planning, it is important to take into account the characteristics that make a community unique. Consideration of unique needs when it comes to mitigating or recovering from natural hazards ensures that all members of the community and their needs are addressed.

Located in Northern Hays County, this bedroom community values its freedom from regulation and taxation from large cities that have sought their annexation in the past. The community boundaries surround the Bear Oaks Subdivision which voted to be incorporated as a village on November 4, 1997. This fairly new community is comprised of approximately 159 residences within 687 acres in Hays County.

Regarded as “the Best Little Town in Texas”, Bear Creek prioritizes maintaining the rural character of their area and their discretion on how it is developed.



Hays County Hazard Mitigation Plan, Village of Bear Creek Annex

Bear Creek is governed by a Mayor and 2 Commissioners and supported by a Village Secretary. The community owns no public buildings, equipment or vehicles.

Children in the Village attend schools within Dripping Springs Independent School District (ISD). Bear Creek's main utility providers are shown in Table BC.1.

Major Employers

The Village of Bear Creek is 100% residential, and has no commercial properties outside of operations that are run out of residences. (HAZUS scenarios in Section 2, the risk assessment portion of this annex, indicate that there are 11 commercial structures within the community. HAZUS is Federal Emergency Management Agency (FEMA) software used by emergency management professionals to estimate potential losses from disasters. This software bases property counts and values on aggregate census blocks, in the absence of parcel data. These references differ from community input, but are given as simulated values based on National averages.)

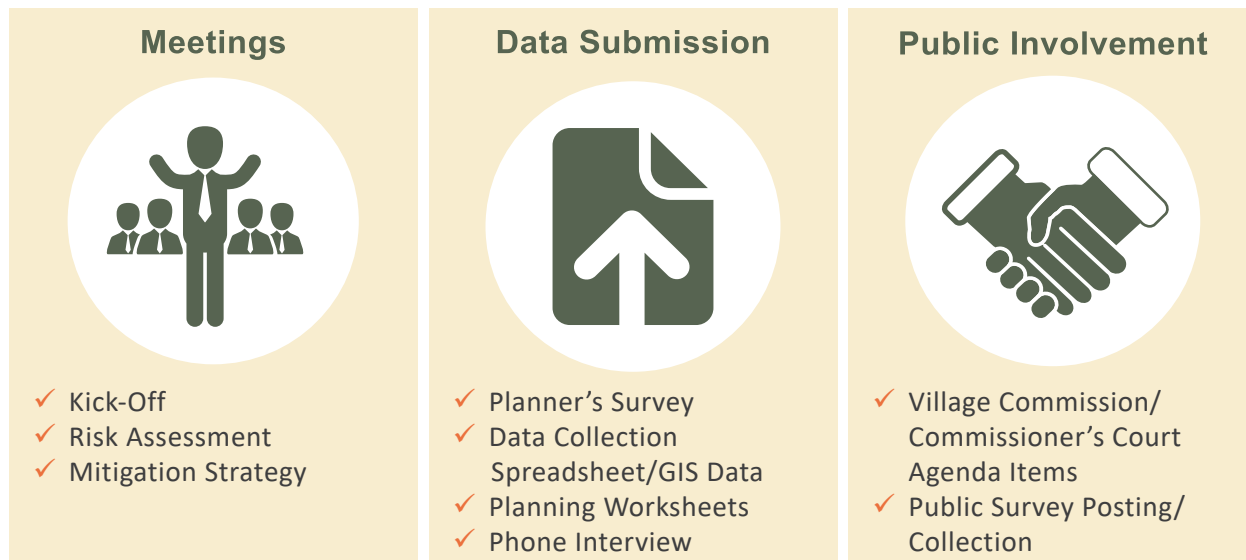
Table BC.1, Utility Providers

Type	Provider
Electric	Pedernales Electric Cooperative (PEC)
Water	West Travis County Public Utility Agency/ Private Wells and Rainwater Collection Systems

Community Planning Involvement

MPC planning activities for the Hays County Hazard Mitigation Plan (HMP) Update are captured in Figure BC.2, which utilizes check-marks to indicate each of the activities that were completed by Bear Creek MPC members.

Figure BC.2, Village of Bear Creek Plan Participation





1.2 Outreach Strategy

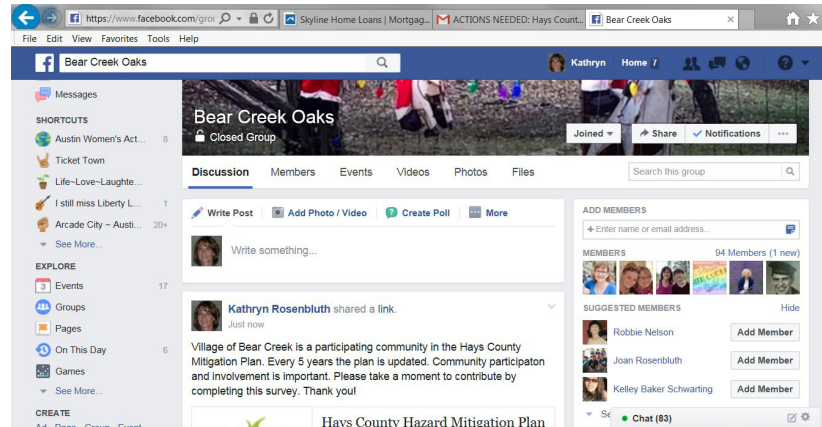
The Village of Bear Creek was very active in the following outreach activities used to request public participation in the Hays County HMP Update. Their activities included promotion of the HMP Public Survey, a Village Commission announcement, plan phase newsletter distribution and a draft plan public comment period.

Public Survey Promotion

The Village of Bear Creek advertised the Hays County HMP Update Public Survey on the Bear Creek Oaks community Facebook page.

As of March 15, 2017, Bear Creek had 28 residents respond to the public survey. Survey data was directly incorporated into the risk ranking process for hazards and mitigation actions. Details regarding the incorporation of the survey results is included in Chapter 2, the risk assessment portion of the main plan document.

Figure BC.3, Bear Creek Survey Promotion



Village Commission Meeting Announcement

On December 19, 2016, the Village Secretary presented information on the Hays County HMP Update to the Bear Creek Commissioners. Elected officials, local agency leaders and members of the public attended the meeting. The agenda for this presentation is included in Plan Appendix A.

Plan Phase Newsletters

Bear Creek MPC utilized newsletters for each phase of the planning process in order to share updates with stakeholders, elected officials, Village staff and the public. Copies of the newsletters can be found in Plan Appendix A of the Hays County HMP Update.

Plan Draft Public Review and Comment Period

The link to the draft Hays County HMP Update was posted on the Village of Bear Creek website from July 12, 2017 until July 26, 2017. A hard copy was placed in the North Hays Fire/Rescue building (as there are no village-owned buildings in which to make it available to the public). No public comments were received during this review period.

1.3 Incorporation of Sources

In addition to stakeholder and public input, the MPC also reviewed other Village planning resources that could provide useful information for the plan update process. Table BC.2 lists the documents reviewed and how they were considered for incorporation in the updated plan.

Hays County Hazard Mitigation Plan, Village of Bear Creek Annex



Table BC.2, Review/Incorporation of Sources

Name of Document	Type	How Incorporated
2013 State of Texas HMP	Plan	Utilized hazard definitions and hazard classification names.
Flood Insurance Study	Study	Incorporated best available hydraulic and hydrologic study results for flood hazard profile.
Village of Bear Creek Plans of Proposed Street Improvements	Plan	Existing plan for improvement that is funded and can be enhanced with mitigation.
Driveway Permit Process	Procedure	Reviewed for possible mitigation enhancements in driveway construction to mitigate the impacts of flood and expansive soils. (Village of Bear Creek)
Well Monitoring Data	Data	Reviewed as evidence of drought and water shortage. (Village of Bear Creek, 2013)



Section 2: Risk Assessment

Bear Creek Jurisdictional Hazards

This section contains Bear Creek's hazard profiles for each natural hazard included in the Hays County HMP Update. Profiles include:

- Location - the area where the hazard is known to occur
- Previous Occurrences - a history of reported events for the hazard
- Significant Previous Occurrences (when applicable) - notable hazard events within the community
- Extent - the strength or magnitude of the hazard
- Probability - the likelihood of the hazard event occurring in the future
- Impact - the consequence or effect (or possible effect) of hazard events
- Vulnerability Summary - identification of structures, systems, populations or assets susceptible to loss or damage

Hazard descriptions and extent scales for hazard magnitudes are found in Chapter 2, the risk assessment portion of the main plan document.

When available, data specific to Bear Creek was used for hazard analysis. When no instances were reported specifically for the jurisdiction for regional hazards, County-level data was applied.

State and national datasets were used to determine occurrence, extent, and the respective probabilities, rather than verbal testimonies, in an effort to retain data consistency. For some hazards, the National Oceanic and Atmospheric Administration (NOAA) Storm Events Database was used as the most comprehensive data available for hazards. The Storm Events Database does not always reflect the most recent totals for fatality, injury and damage amounts shown for previous occurrences. The Previous Occurrences paragraphs identify instances in which this may occur. Verbal testimony, when available, was integrated into impact or vulnerability summaries to account for updates in this data.

2.1 Hazard Profiles

Hazard profiles for the Village of Bear Creek include:

- Drought - Within Chapter 2, the risk assessment portion of the main plan document.
- Extreme Heat - Within Chapter 2, the risk assessment portion of the main plan document.
- Severe Winter Storms - Within Chapter 2, the risk assessment portion of the main plan document.
- Lightning - Within Chapter 2, the risk assessment portion of the main plan document.
- Hailstorms
- Windstorms
- Tornadoes
- Expansive Soils
- Floods
- Hurricanes/Tropical Storms
- Earthquakes
- Dam/Levee Failure (not profiled for Village of Bear Creek)
- Wildfires



Hailstorm

Hailstorms: Location

The entire extent of the Village of Bear Creek is exposed to some degree of hail hazard. Since hail can occur at any location, hail events could be experienced anywhere within the jurisdiction.

Hailstorms: Previous Occurrences

While the Village of Bear Creek has not had any previous occurrences reported through the NOAA Storm Events Database, if an event were to occur, it would be similar in size and magnitude to events within the surrounding County area. There were 57 hail events reported for Hays County since the year 1967.

Hailstorms: Extent and Probability

The Tornado and Storm Research Organization (TORRO) created a hail extent index to measure hail called the Hailstorm Intensity Scale. According to the reported previous hail occurrences for the planning area, the maximum hail extent experienced was up to 3 inches or 76.20 millimeters in diameter (corresponding to a TORRO Hailstorm Intensity Scale classification of a “Super Hailstorm”). Refer to Chapter 2, the risk assessment portion of the main plan document, for hail extent scale descriptions.

Based on 57 reported events in 49 years, a hail event occurs in Hays County approximately once a year, on average. Since hail events can happen anywhere throughout the HMP update area, the Village of Bear Creek’s future probability is assumed to be similar to the entire County area. The Village’s probability for a hail event is approximately once every year (on average) in the future, with hail up to 3 inches, or 76.20 millimeters in diameter, corresponding to a TORRO Hailstorm Intensity Scale classification of a “Super Hailstorm.”

Hailstorms: Impact

Based on the maximum hail extent experienced in the surrounding County area (76.20 mm), the TORRO Hailstorm Intensity Scale (found in Chapter 2, Risk Assessment within the Hays County HMP Update) indicates that impact can be expected to include any of the following:

- Varying degrees of damage to vegetation and crops
- Damage to plastic structures
- Varying degrees of damage to glass
- Paint and wood scored
- Vehicle bodywork damage
- Varying degrees of roof damage
- Varying degrees of risk of injuries
- Varying degrees of aircraft damage
- Brick walls pitted
- Risk of severe or even fatal injuries to persons caught in the open

Hailstorms: Vulnerability Summary

According to community testimony, hail events are a regular occurring hazard in Bear Creek and are somewhat of an acceptable risk to those who live there. Bear Creek is a subdivision that incorporated to become a Village, so the structures throughout the community are single family residences with similar materials and construction methods. The roofs and windows of these residential structures are susceptible to hail damage. Events typically cause universal minor damage to the 159 roofs in the community. As there are no Village-owned structures or vehicles, there is no concern for damage to publicly-owned property.





Windstorms

Windstorms: Location

The entire extent of the Village of Bear Creek is exposed to some degree of wind hazard. Since wind can occur at any location, wind events could be experienced anywhere within the jurisdiction.

Windstorms: Previous Occurrences

While the Village of Bear Creek has not had any previous occurrences reported through the NOAA Storm Events Database, if an event were to occur, it would be similar in size and magnitude to events within the surrounding County area. There were 38 wind events reported for Hays County and its unincorporated jurisdictions since the year 1974.

Windstorms: Extent and Probability

Wind is measured by the Beaufort Wind Scale that relates wind speed to observed conditions on land and sea. According to the reported previous windstorm occurrences in the planning area, the maximum wind extent experienced was 70 knots (corresponding to Beaufort Wind Classification: Hurricane). Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of wind extent scales.

Based on 38 reported events in 42 years, a wind event occurs in Hays County approximately once every year, on average. Since wind events can happen anywhere throughout the HMP planning area, the Village of Bear Creek's future probability is assumed to be similar to the surrounding County area. In the future, the Village's probability for a wind event of up to 70 knots or 80.55 miles per hour (Beaufort Wind Classification: Hurricane), is approximately once every year (on average).

Windstorms: Impact

Data available from the Texas Department of Transportation's Crash Records Information System shows that between the years of 2010 and 2017, rural Hays County experienced 5 crashes related to severe crosswind weather conditions (see Table BC.3). There were no injuries reported from these crash events. Since wind events occur on a regional scale, it is assumed that weather-related crashes in the surrounding County area would be similar to those experienced during these conditions within the Village of Bear Creek.



Table BC.3, Windstorms, Vehicle Accidents, Hays County

City	Fatality	Incapacitating Injury	Incapacitating Non-Injury	Possible Injury	Crash Year	Street Name	Surface Condition	Weather Condition
Rural Hays County	0	0	0	0	2010	LIME KILN RD	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2017	US0290	Wet	Severe Crosswinds

(Texas Department of Transportation, 2017)



Structures can be damaged by flying debris and impact from winds damaging rooftops and causing other structural damage. Critical infrastructure, such as utility poles and street signals, could also be disrupted, impacting all residents in the affected area. Debris on the roadway can also cause obstruction for emergency responders' ability to provide services.

Windstorms: Vulnerability Summary

According to community testimony, Bear Creek has suffered undocumented/unrecorded damage from straight line wind events in the past. Two years ago, a wind event caused roof damage to multiple residential structures and ripped off treetops and uprooted several trees from the ground. Although power was not affected, there were multiple trees that fell into the roadways and obstructed traffic. The 159 residences, numerous trees and multiple roadways in Bear Creek are vulnerable.

The Village includes solely residential structures, with no manufactured or modular structures. However there are 2 members of the population of 369 living below the US poverty level (according to HAZUS-MH 3.2 Census 2010 population estimates) that could have increased vulnerability to repair damages to their homes in the case of an event.

As the Village Hall is run out of the homes of the Village Officials and Village Secretary, damage to these unretrofitted structures could result in difficulty conducting the official meetings and business needed to maintain functionality of community processes and service to the community residents.





Tornadoes

Tornadoes: Location

The entire extent of the Village of Bear Creek is exposed to some degree of tornado hazard. Since tornadoes can occur at any location, tornado events could be experienced anywhere within the jurisdiction.

Tornadoes: Previous Occurrences

While the Village of Bear Creek has not had any previous occurrences reported through the NOAA Storm Events Database, if an event were to occur, the event would be similar in size and magnitude to events within the surrounding County area. Table BC.4 lists the 16 tornado events reported for Hays County and its unincorporated jurisdictions since year 1953.

Fatality, injury and damage amounts are shown in Table BC.4, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table BC.4, Tornado Events, Hays County

Location	Date	Type	Magnitude	Fatalities	Injuries	Property Damage	Crop Damage
Hays County	4/28/1953	Tornado	F3	1	5	250,000.00	0.00
Hays County	4/30/1954	Tornado	F1	0	0	250,000.00	0.00
Hays County	5/2/1958	Tornado	F1	0	0	30.00	0.00
Hays County	11/12/1961	Tornado	F2	0	0	2,500.00	0.00
Hays County	9/20/1967	Tornado	NA	0	0	250.00	0.00
Hays County	9/20/1967	Tornado	NA	0	0	30.00	0.00
Hays County	5/10/1975	Tornado	F1	0	0	25,000.00	0.00
Hays County	3/30/1976	Tornado	F2	0	0	25,000.00	0.00
Hays County	3/30/1976	Tornado	F2	0	1	250,000.00	0.00
Hays County	8/10/1980	Tornado	F2	0	0	25,000,000.00	0.00
Hays County	4/22/1985	Tornado	F2	0	0	250,000.00	0.00
Hays County	8/22/1991	Tornado	F1	0	0	2,500.00	0.00
Countywide	5/13/1994	Tornado	F0	0	0	500.00	500.00
Henly	11/15/2001	Tornado	F0	0	1	50,000.00	0.00
Driftwood	10/8/2002	Tornado	F0	0	0	70,000.00	0.00
M. Gainor	5/23/2015	Tornado	EF0	0	0	0.00	0.00
Total				1	7	\$26,175,810.00	\$500.00

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)

Tornadoes: Extent and Probability

Tornadoes are measured by severity on the Fujita and Enhanced Fujita Scale, with a range from 0-6. According to the reported previous tornado occurrences in the jurisdiction, the maximum tornado extent experienced was a category F3 tornado in 1953. Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of tornado extent scales, Fujita (F) Scale and Operational Enhanced Fujita (EF) Scale.





Based on 16 reported events in 63 years, a tornado event occurs approximately every 4 years on average in Hays County. Village of Bear Creek's future probability is assumed to be similar to the surrounding County area. The Village's probability of a tornado event is approximately once every 4 years (on average) in the future, with up to an F3 magnitude.

Tornadoes: Impact

There is no specific event data available for the Village of Bear Creek, from which impacts would be calculated. However, it can be assumed that impacts would be similar to those that the surrounding County area experiences.

Based on Hays County having experienced tornadoes between F0 and F3 levels in the past, if similar events were to happen in the future in the Village, the type of impacts that the jurisdiction can expect associated with those magnitudes would include, from least to greatest:

- Light Damage - Broken branches; shallow rooted trees pushed over; some chimney damage.
- Moderate Damage - Surface damage to roofs; mobile homes pushed off foundation; moving vehicles pushed off the road.
- Significant Damage - Frame houses have roof torn off; mobile homes completely destroyed; train boxcars overturned; large trees snapped or uprooted; smaller debris turned into missiles.
- Severe Damage - Roofs completely torn off well-constructed buildings, along with some walls; majority of trees uprooted; trains overturned; vehicles lifted off the ground.

(Tornado Facts, 2016)

Critical infrastructure, such as utility poles and street signals, could also be disrupted, impacting all residents in the affected area. Debris on the roadway can also cause obstruction for emergency responders' ability to provide services.

Tornadoes: Vulnerability Summary

The Village of Bear Creek includes solely residential structures, with no manufactured or modular structures. However there are 2 members of the population of 369 living below the US poverty level (according to HAZUS-MH 3.2 Census 2010 population estimates) that could have increased vulnerability to repair damages to their homes in the case of an event. Additionally, Village residents have an increased susceptibility to impact due to a lack of documented evacuation routes and lack of mass notification capabilities besides social media.

As the Village Hall is run out of the homes of the Village Officials and Village Secretary, damage to these unretrofitted structures could result in difficulty conducting the official meetings and business needed to maintain functionality of community processes and service to the community residents.





Expansive Soils

Expansive Soils: Location

Figure 2.3 within Chapter 2 (the Risk Assessment portion within the Hays County HMP Update) shows the location of expansive soil areas for the Village. The entire extent of the jurisdiction is classified as having less than 50 percent of the area underlain by soils with clays of high swelling potential, therefore all of the jurisdiction is equally at risk.

Expansive Soils: Previous Occurrences

There was no documentation of site-specific past events of structural damage due to expansive soils from local, State, or national databases queried.

Expansive soils cannot be documented as a time-specific event, except when they lead to structural and infrastructure damage. There are no specific damage reports or historical records of events in the Village, however future events can occur.

Expansive Soils: Extent and Probability

Considering the amount of swelling potential within the jurisdiction, as well as the lack of reported events, the probability of a future event is low (0 - 1 occurrences in the next 10 years affecting less than 5 structures).

Expansive Soils: Impact

Foundation issues for slab buildings and road base pads for mobile homes are the most visible impacts to infrastructure and structures. Undocumented reports of impact include small cracks to foundation and terrain. Increased severity in weather and natural conditions lead to increased soil swelling, resulting in deeper and longer cracks, and possible structural shifting.

Expansive Soils: Vulnerability Summary

Areas within the Village of Bear Creek are not readily experiencing new development. Most structures were constructed 20 to 30 years ago, when the community was not yet incorporated. Since building standards were not in place, it is possible that less than 50% of the 159 structures could be impacted by expansive soils in the event of shrink-swell activity. This corresponds with the USGS expansive soil region classification for the Village of Bear Creek.



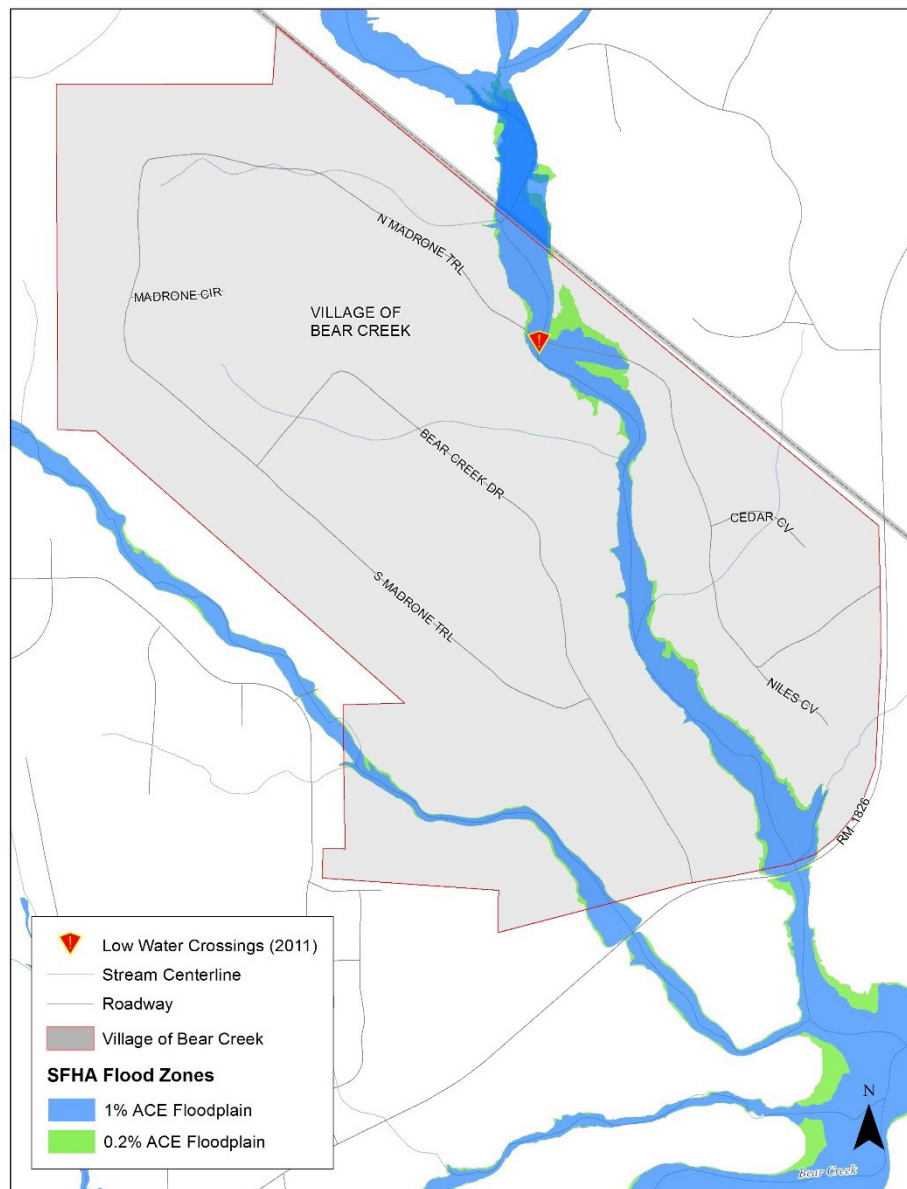
Floods



Floods: Location

The location of low water crossings, as well as the 1% (100 year) and 0.2% (500 year) Annual Chance Event (ACE) floodplains for the Village of Bear Creek are shown in Figure BC.4. This figure represents the areas within the jurisdiction that are most affected by riverine flooding and is based upon newly developed hydrological and hydraulic analysis. The new analysis is considered the best information available to date. Table BC.5 provides the total acreage in the jurisdiction that is located in the 1% and 0.2% floodplains.

Figure BC.4, Special Flood Hazard Areas and Low Water Crossings, Village of Bear Creek



(Texas Natural Resources Information System, 2011)




Table BC.5, Village of Bear Creek Floodplain Acreage

Jurisdiction	100yr (1%) Floodplain Acres (Includes Floodway)	500yr (0.2%) Floodplain Acres (Includes 100yr)
Village of Bear Creek	44	53

Floods: Previous Occurrences

Hays County was included in 3 Federal disaster declarations between 2013 and 2015, all related to flooding. Although the NOAA Storm Events Database did not list flood events reported specifically for the Village of Bear Creek, Table BC.6 lists the 69 documented events reported for Hays County between the years 1997 and 2016. Due to the size and extent of some flood occurrences, as well as the regional nature of reports in the NOAA Storm Events Database, the Village of Bear Creek may have been affected by many of the events that were reported for the surrounding areas.

Fatality, injury and damage amounts are shown in Table BC.6, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table BC.6, Flood Events, Hays County

Location	Date	Type	Fatalities	Injuries	Property Damage	Crop Damage
Countywide	5/23/1997	Flash Flood	0	0	10,000.00	0.00
Countywide	6/6/1997	Flash Flood	0	0	10,000.00	0.00
Countywide	6/7/1997	Flash Flood	0	0	15,000.00	0.00
Countywide	6/8/1997	Flash Flood	2	7	2,500,000.00	50,000.00
Countywide	6/21/1997	Flash Flood	0	0	5,000.00	0.00
Countywide	6/22/1997	Flash Flood	0	0	50,000.00	50,000.00
Countywide	2/21/1998	Flash Flood	0	0	5,000.00	0.00
Countywide	7/3/1998	Flash Flood	0	0	20,000.00	0.00
Countywide	8/22/1998	Flash Flood	0	0	20,000.00	10,000.00
Countywide	8/23/1998	Flash Flood	0	0	10,000.00	0.00
Countywide	10/17/1998	Flash Flood	0	100	500,000.00	50,000.00
HAYS (ZONE)	10/17/1998	Flood	0	25	4,000,000.00	50,000.00
HAYS (ZONE)	10/17/1998	Flood	0	25	4,000,000.00	50,000.00
Countywide	6/21/1999	Flash Flood	0	0	3,000.00	0.00
Countywide	6/9/2000	Flash Flood	0	0	15,000.00	0.00
Countywide	11/2/2000	Flash Flood	0	0	20,000.00	0.00
HAYS (ZONE)	11/4/2000	Flood	0	0	0.00	0.00
North Portion	8/26/2001	Flash Flood	0	0	10,000.00	0.00
Countywide	8/31/2001	Flash Flood	0	0	20,000.00	0.00
Countywide	8/31/2001	Flash Flood	0	0	30,000.00	20,000.00
Countywide	11/15/2001	Flash Flood	0	20	200,000.00	50,000.00
HAYS (ZONE)	11/15/2001	Flood	0	0	0.00	0.00



Hays County Hazard Mitigation Plan, Village of Bear Creek Annex

Table BC.6, Flood Events, Hays County, (cont.)

Location	Date	Type	Fatalities	Injuries	Property Damage	Crop Damage
West Portion	6/30/2002	Flash Flood	0	0	10,000.00	0.00
HAYS (ZONE)	7/1/2002	Flood	0	0	0.00	0.00
South Portion	7/1/2002	Flash Flood	0	0	0.00	0.00
Countywide	7/2/2002	Flash Flood	0	0	0.00	0.00
West Portion	7/3/2002	Flash Flood	0	0	0.00	0.00
West Portion	7/5/2002	Flash Flood	0	0	0.00	0.00
South Portion	9/19/2002	Flash Flood	0	0	0.00	0.00
South Portion	10/24/2002	Flash Flood	0	0	0.00	0.00
Countywide	11/4/2002	Flash Flood	0	0	0.00	0.00
Countywide	2/20/2003	Flash Flood	0	0	10,000.00	0.00
West Portion	6/13/2003	Flash Flood	0	0	5,000.00	0.00
South Portion	9/11/2003	Flash Flood	0	0	3,000.00	0.00
Northwest Portion	1/16/2004	Flash Flood	0	0	3,000.00	0.00
East Portion	6/5/2004	Flash Flood	0	0	0.00	0.00
Countywide	6/9/2004	Flash Flood	0	0	350,000.00	0.00
Driftwood	6/26/2004	Flash Flood	0	0	0.00	0.00
West Portion	6/27/2004	Flash Flood	0	0	0.00	0.00
West Portion	6/28/2004	Flash Flood	0	0	0.00	0.00
Countywide	6/29/2004	Flash Flood	0	0	0.00	0.00
South Portion	6/30/2004	Flash Flood	0	0	0.00	0.00
Hays (Zone)	6/30/2004	Flood	0	0	0.00	0.00
West Portion	7/25/2004	Flash Flood	0	0	0.00	0.00
Countywide	10/2/2004	Flash Flood	0	0	0.00	0.00
Countywide	10/23/2004	Flash Flood	0	0	0.00	0.00
Hays (Zone)	10/23/2004	Flood	0	0	0.00	0.00
Hays (Zone)	10/24/2004	Flood	0	0	0.00	0.00
Countywide	11/16/2004	Flash Flood	0	0	0.00	0.00
Hays (Zone)	11/17/2004	Flood	0	0	0.00	0.00
Countywide	11/21/2004	Flash Flood	0	0	0.00	0.00
Countywide	11/22/2004	Flash Flood	0	0	0.00	0.00
Countywide	11/22/2004	Flash Flood	0	0	0.00	0.00
Southeast Portion	11/23/2004	Flash Flood	0	0	0.00	0.00
South Portion	5/6/2006	Flash Flood	0	0	0.00	0.00
Henly	3/30/2007	Flash Flood	0	0	0.00	0.00
Driftwood	3/30/2007	Flood	0	0	0.00	0.00
Henly	5/2/2007	Flash Flood	0	0	0.00	0.00
Henly	7/2/2007	Flash Flood	0	0	0.00	0.00



Table BC.6, Flood Events, Hays County, (cont.)

Location	Date	Type	Fatalities	Injuries	Property Damage	Crop Damage
Henly	5/17/2010	Flash Flood	0	0	0.00	0.00
Driftwood	9/7/2010	Flash Flood	0	0	0.00	0.00
Driftwood	5/10/2012	Flash Flood	0	0	0.00	0.00
Driftwood	5/11/2012	Flash Flood	0	0	0.00	0.00
Fitzhugh	5/17/2015	Flash Flood	0	0	0.00	0.00
Henly	5/30/2015	Flash Flood	0	0	0.00	0.00
Fitzhugh	6/14/2015	Flash Flood	0	0	0.00	0.00
Driftwood	10/30/2015	Flash Flood	0	0	10,000,000.00	0.00
Fitzhugh	5/19/2016	Flash Flood	0	0	0.00	0.00
Driftwood	8/16/2016	Flash Flood	0	0	0.00	0.00
Totals			2	177	\$21,824,000.00	\$330,000.00

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)



Floods: Significant Past Events

Hays County experienced 3 disaster declarations discussed under Floods: Previous Occurrences. Refer to the *Floods: Significant Past Events* section within the Hays County Annex for narratives discussing these events.

Floods: Extent

Flood extent is described through a combination of ground elevation, river heights, 100-year Water Surface Elevations (WSE's) and HAZUS depth grids. An example of flooding within the jurisdiction are areas along Bear Creek. These areas are exposed to the greatest extent of a flood event. Areas of the community along the creek have an approximate overbank ground elevation of 877 feet with an intersecting 100 year Water Surface Elevations of 881 feet. For a 100-year event, water depth of approximately 4 feet can be expected within this area. A further analysis of Bear Creek is described below.

With Bear Creek having an approximate average normal in-channel elevation of 866 feet (per Light Detection and Ranging [LiDAR] data) through the center of the community, flood depths based on the WSE are approximately 11 feet.

Floods: Probability

Probability has been calculated on the basis of NOAA reported events, as a standard, consistent calculation method for all hazards profiled with the Hays County HMP. Based on 69 reported events in 19 years, a flood event occurs approximately 3 to 4 times per year on average in Hays County and its unincorporated jurisdictions. Due to the size and extent of some flood occurrences, as well as the regional nature of reports in the NOAA Storm Events Database, the Village of Bear Creek's future probability is assumed to be similar to the surrounding County area. The Village can expect a flood event approximately 3 to 4 times per year (on average) in the future, up to 11 feet in depth.





Floods: Impact

A 100-year flood analysis was run for the study area. This analysis utilized the best available LiDAR (COA 2012 and CAPCOG 2008) and Depth Grids. The following describes the inventory counts and building replacement values for the jurisdictional area.

Village of Bear Creek Building Counts*			
Residential	Commercial	Other	Total
131	11	9	151

Village of Bear Creek Building Replacement Value*		
Building (\$)	Content (\$)	Total (\$)
63,243,144	35,328,106	98,571,249

A Probabilistic 100-year Return Period HAZUS-MH 3.2 analysis was run on the Village of Bear Creek. HAZUS results are calculated to census blocks. These blocks were then intersected with the Bear Creek to run a weighted area analysis to get jurisdictional results. The following paragraphs describe results of the 100-year Return (1% Annual Chance Event) weighted area analysis.

HAZUS-MH Results

General Building Stock Damage

HAZUS estimates that 4 buildings will be at least moderately damaged in the Village of Bear Creek. 'At least moderately damaged' is defined by HAZUS as greater than 10% damage to a building. The majority of damage can be expected to impact residential areas (75%). The remaining damages (25%) are expected for commercial, industrial, agriculture and religious buildings.

Residential Buildings*	Commercial Buildings*	Other Buildings*	Total Buildings*
3	1	0	4

Building-Related Losses

Exposed Value is the total building and content values for structures within the community. The exposed value for the community is \$98,571,249. The total building-related losses were \$67,894 for this scenario. This represents 0.10% of the total replacement value of the community. Loss values are divided into building and content loss dollars.

Building Loss (\$)*	Content Loss (\$)*	Total Loss (\$)*
42,676	25,218	67,894

*HAZUS software bases property counts and values on aggregate census blocks, in the absence of parcel data. These references may differ from community input, but are given as simulated values based on National averages for comparable census blocks. Bear Creek has no commercial buildings, according to local officials.





Essential Facility Damage

HAZUS does not estimate any critical facilities or infrastructure interruption to be for more than 1 day. The model estimates that 100% of community hospital beds would be available for use by patients already in the hospital and for those injured by an event.

Debris Generation

HAZUS estimates the amount of debris that will be generated in this scenario at a total of 4 tons. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckload (1 to 25 tons per truck) to remove the building debris generated in this scenario.

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS also estimates the number of people displaced that will require accommodations in temporary public shelters. The model estimates 2 people will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, no people are estimated to seek temporary shelter in public shelters.

Floods: Vulnerability Summary

There are 3 structures in the floodplain that were built prior to the incorporation of the Village of Bear Creek. Due to this timing, there is no floodplain documentation for these structures on file with the Village, indicating the height of the structures' lowest floors in relation to Base Flood Elevations for their locations. Those residing in these homes are vulnerable, as their level of risk is unknown.

Traffic flow, as well as ingress and egress for certain residences can be affected when floodwaters overtop North Madrone Trail, the only low water crossing in the Village of Bear Creek.

National Flood Insurance Program Repetitive Loss

The Village of Bear Creek is a current participant in the National Flood Insurance Program (NFIP). As of September of 2016, the Village does not have any listed RL or SRL properties according to FEMA RL/SRL data.



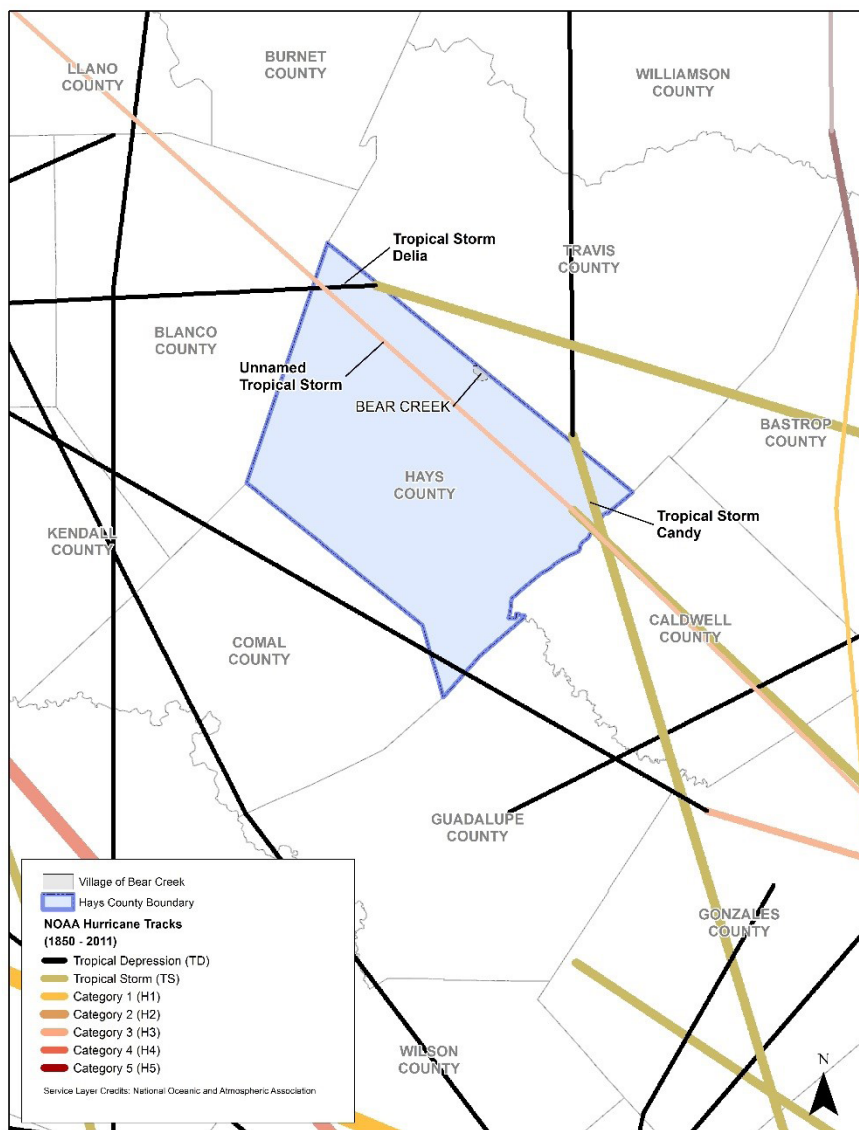


Hurricanes/Tropical Storms

Hurricanes/Tropical Storms: Location

Due to the regional nature of a hurricane or tropical storm event, the entire extent of the Village of Bear Creek is equally exposed to a hurricane or tropical storm. Figure BC.5 illustrates the location of the jurisdiction with historical hurricane and tropical storm paths documented by NOAA's Hurricane Tracker from 1850 to 2011.

Figure BC.5, Historical Hurricane/Tropical Storm Paths, Village of Bear Creek



(National Oceanic and Atmospheric Administration, 2016)

Hurricanes/Tropical Storms: Previous Occurrences

Previous events are described below based on the NOAA Storm Events Database for Tropical Storm Hermine and NOAA Hurricane Tracker for all other events. By the time most hurricanes reach the County, they are tropical storms, depressions or thunderstorms. Because hurricane and tropical storm events occur on a regional scale, all events listed for Hays County have been included, as they would also impact the Village of Bear Creek.





July 13 to July 22, 1909 – An unnamed storm made landfall near Freeport, as a Category 3 Hurricane. This storm impacted Hays County and participating communities as a tropical depression with wind speeds up to 30 knots. No significant damages, injuries, or fatalities were reported for the Village.

June 22 to June 26, 1968 – Tropical Storm Candy made landfall near Port Aransas. This storm impacted Hays County and participating communities as a tropical storm with wind speeds slowing to 30 knots as a tropical depression just after leaving the County. No significant damages, injuries, or fatalities were reported for the Village.

September 1 to September 7, 1973 – Tropical Storm Delia made landfall near the border of Brazoria and Matagorda Counties. This storm impacted Hays County and participating communities as a tropical storm with wind speeds slowing to 30 knots as a tropical depression just after leaving the County. No significant damages, injuries, or fatalities were reported for the Village of Bear Creek.

September 6 to September 8, 2010 – According to the NOAA Storm Events Database, Tropical Storm Hermine made landfall near the Texas/Mexico border on the night of September 6. South Central Texas was hit very hard with widespread rains of 8 to 12 inches across much of the IH-35 corridor from Austin down to San Antonio.

Hurricanes/Tropical Storms: Extent and Probability

The Saffir-Simpson Scale measures pressure, wind speed, and storm surge in 5 categories. According to the reported previous hurricane occurrences in the jurisdiction, the maximum hurricane extent experienced was categorized as a Tropical Storm.

Based on 4 reported events in 107 years, a hurricane or tropical storm event occurs approximately every 27 years on average in Hays County. Since hurricane and tropical storm events can happen anywhere throughout the HMP update area, the Village of Bear Creek's future probability is assumed to be similar to the surrounding County area. In the future, the Village can expect an event approximately once every 27 years on average, of up to a magnitude of a tropical storm at a 100-year Max Wind Speed of 68 mph based on historical extents and HAZUS analysis.

Hurricanes/Tropical Storms: Impact

A Probabilistic 100-year Return Period HAZUS-MH 3.2 analysis was run on the participating communities. The following paragraphs describe the results of this analysis.

HAZUS-MH Results

General Building Stock Damage

The total property damage losses were \$59,379. The majority of damage can be expected to impact residential areas (98%). The remaining damages (2%) are for commercial, industrial, agricultural and religious buildings. While some building damage is experienced, it is estimated that no buildings will be completely destroyed or experience severe damage. Exposed Value is the total building and content values for structures within the community. Loss values are divided separately for building and content loss in dollars.

Exposed Value (\$) (Building + Content)	Building Loss (\$)	Content Loss (\$)	Total Loss (\$)
98,571,249	59,379	0	59,379





Essential Facility Damage

HAZUS does not estimate any critical facilities or infrastructure to be interrupted for more than 1 day. The model estimates that 100% of available hospital beds would be available for use by patients already in the hospital and for those injured by the hurricane.

Debris Generation

HAZUS estimates the amount of debris that will be generated by the hurricane.

The model estimates that a total of 3 tons of debris will be generated. Of the total amount, Brick/Wood comprises 100% of the total. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckload (1 to 25 tons per truck) to remove the building debris generated by the hurricane.

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of people displaced that will require accommodations in temporary public shelters. The model estimates no households to be displaced due to the hurricane. While there is an estimation of over \$59,000 in property damages expected, it is aforementioned that “no buildings would be completely destroyed or experience severe damage.” Residents would likely remain in their homes as damages were repaired, therefore no temporary shelter is needed.

Hurricanes/Tropical Storms: Vulnerability Summary

Similar to the impacts of windstorms, hailstorms, and lightning, the Village of Bear Creek can expect to be impacted with debris and possible utility interruptions of critical infrastructure if the event is a stronger magnitude than those previously experienced by the Village. In addition, the community’s proximity to IH-35 could lead to traffic delays caused by major evacuation efforts, if the highway is used as an evacuation route for coastal residents. The Farm-to-Market roads used to access the community could also become congested by people seeking alternate routes.



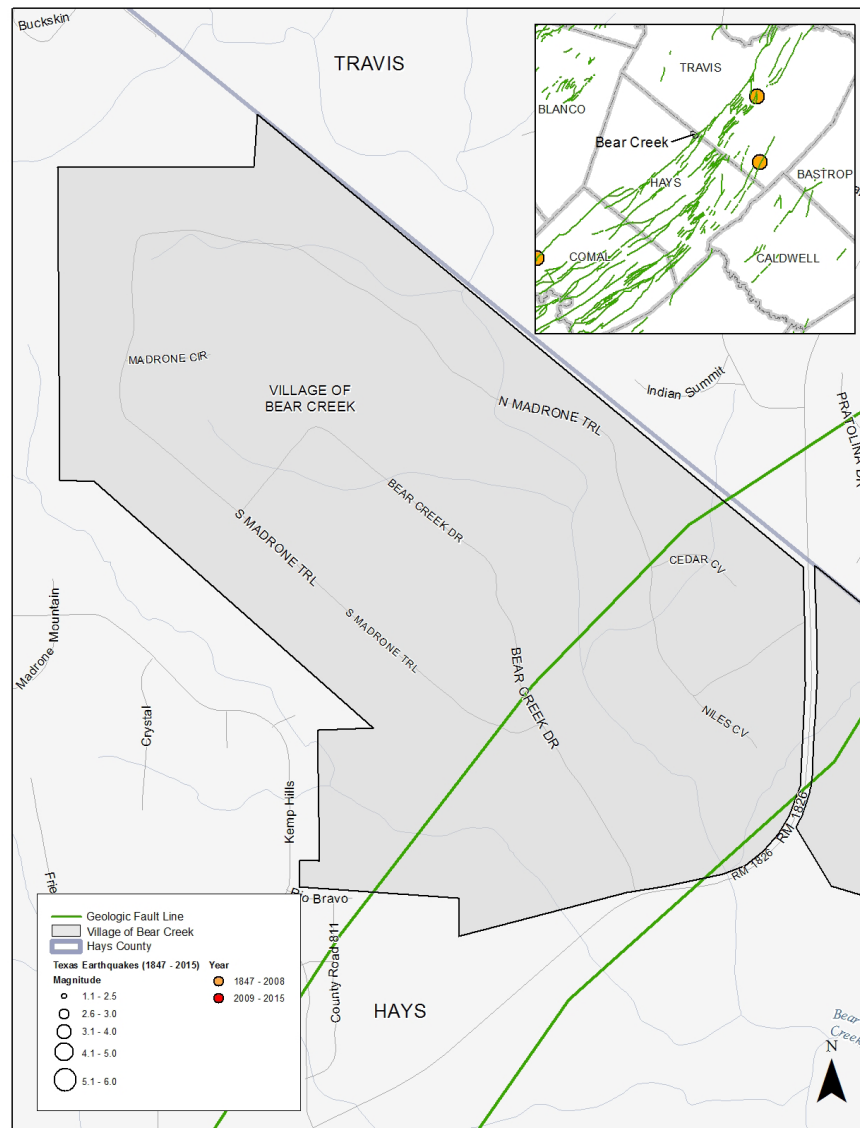


Earthquakes

Earthquakes: Location

Locations within proximity to USGS-documented fault lines are typically the areas most at-risk for earthquakes. Figure BC.6 shows fault lines and the locations of earthquake events occurring from 1847 to 2015 in relation to the Village of Bear Creek.

Figure BC.6, Texas Earthquakes, 1847 – 2015, Village of Bear Creek



(USGS Earthquake Hazard Program, 2015)

Earthquakes: Previous Occurrences

According to USGS 1847 to 2015 data, there have been no documented earthquake events for the Village of Bear Creek, as illustrated in Figure BC.6.



Earthquakes: Extent and Probability



Earthquakes are measured by Peak Ground Acceleration (PGA). The HAZUS Max PGA for the jurisdiction is 1.56% (see Village of Bear Creek: Impact Section for a description of the HAZUS Analysis). This corresponds to the Modified Mercalli Scale Category IV, with light perceived shaking and no potential structure damage. HAZUS measures PGA on a census tract level. Cities within more than 1 census tract were assigned the highest PGA level to maximize possible extent. Refer to Chapter 2, Risk Assessment within the Hays County HMP Update for extent scale and PGA descriptions.

As there have been no recorded previous occurrences of earthquakes for the Village of Bear Creek and the PGA is less than 2% for the area, the probability of an earthquake in the Village in the future is low (0 - 1 occurrences in the next 10 years at up to a 500-year PGA of 1.56%).

Earthquakes: Impact

The FEMA How-To Guidance, Understanding Your Risks (FEMA 386-2, page 1-7), suggests the earthquake hazard should be profiled if the PGA is greater than 3%, where PGA is measured in the acceleration of gravity (g). The Village's PGA is less than 3%g (0.03) and there have been no recorded earthquakes in or near the update area. Therefore, only a minimum level-1 HAZUS analysis was profiled using the 500-year probability event scenario. The HAZUS analysis produced a PGA of 1.56%. The HAZUS scenario would produce \$0 in building damages (Residential, Commercial, Agriculture, Religious and Government) from an event. Critical facilities and Infrastructure would not experience any loss of service. There would be no critical facilities or infrastructure would experienced moderate to complete damage. No debris would be generated from this event and no people or households would require temporary housing. There would be no moderate, extensive or completely damaged buildings by this event. HAZUS estimates no residents are expected to be displaced from their homes or will require accommodations in temporary public shelters due to the simulated earthquake. Additionally, there would be no casualties or fatalities from this event.

Earthquakes: Vulnerability Summary

While the probability of an earthquake in the Village Bear Creek is low, with no significant prior events on file, there are fault lines within the community that could cause impact if there were to be an increase in seismic activity in the area. There are 2 fault lines located on the east side of the Village according to USGS data. Bear Creek could expect to be impacted with debris and possible utility interruptions during an unlikely and unprecedented event that exceeds the 500 -year probability event scenario run in HAZUS. If an event of this magnitude were to incapacitate a roadway, emergency responders would be hindered from responding, leaving residents at risk.

The following local roadways are crossed by the USGS fault lines displayed on Figure BC.6: Bear Creek Drive, Cedar Cove, N. Madrone Trail, and S. Madrone Trail.





Page 23 Dam/Levee Failure have been redacted from this copy of the plan.

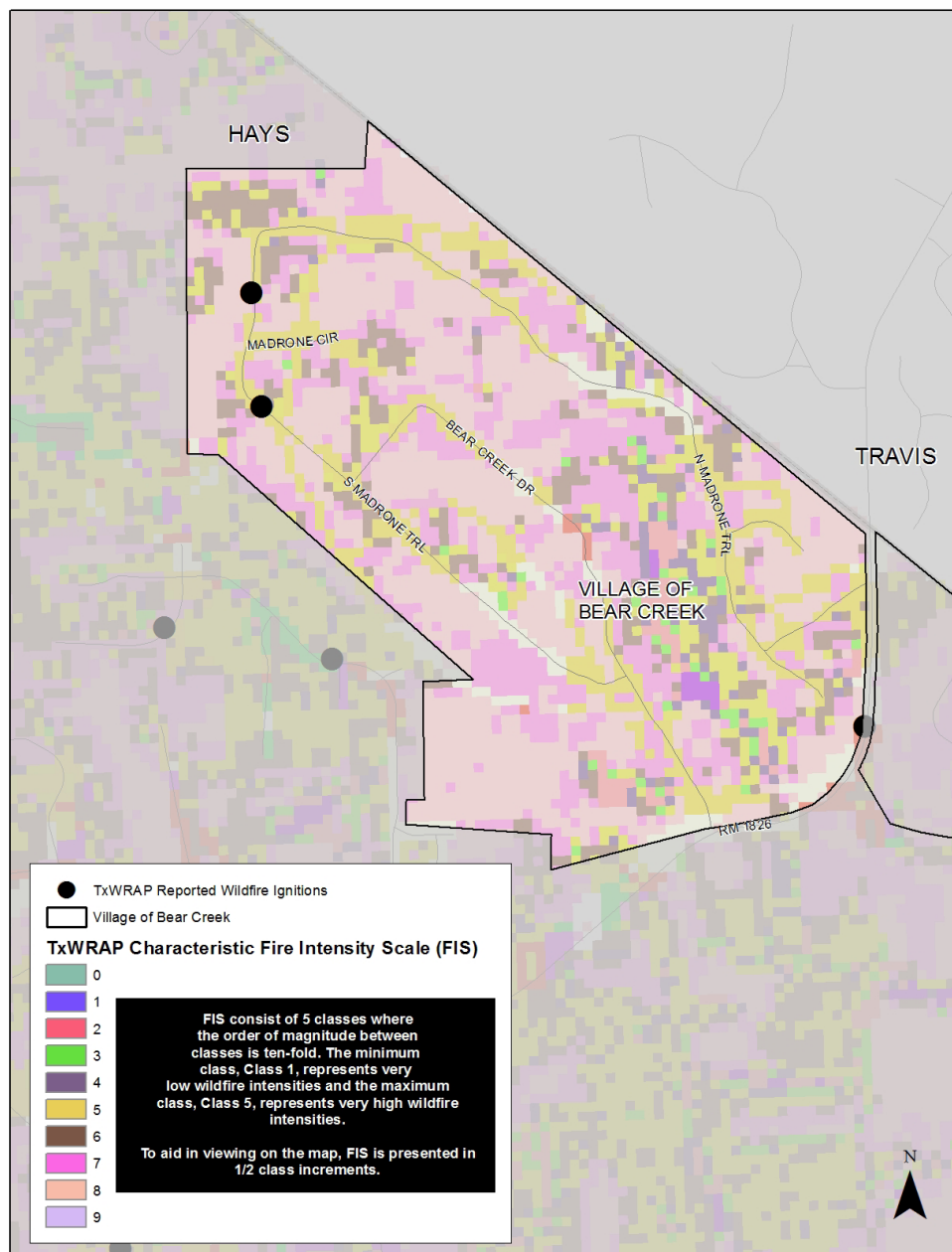
Wildfires



Wildfires: Location

Wildfires can be ignited from a variety of sources including lightning or human activity such as campfires, smoking, arson, or equipment use. The Texas A&M Forest Service's Texas Wildfire Risk Assessment Portal (TxWRAP) can be used to help communities understand their wildfire risk. Figure BC.7 below shows the location of TxWRAP's documented wildfire occurrences with Fire Intensity Scale (FIS) classifications within the Village of Bear Creek. TxWRAP identifies FIS areas as those where wildfire fuels and associated potential dangerous fire behavior exist, based on a weighted average of 4 percentile weather categories.

Figure BC.7, Fire Intensity Scale (FIS) and Reported Wildfire Ignitions, Village of Bear Creek



(Texas A&M Forest Service, 2016)





Wildfires: Previous Occurrences

Table BC.7 shows the reported wildfire ignitions within the Village of Bear Creek, according to TxWRAP and USGS Federal Fire Occurrence data from the years 1980 to 2015.

Table BC.7, Wildfire Ignitions, Village of Bear Creek

FPA ID	Date	Fire Size (Acres)
SFO-TX02240705-6382	1/14/2005	1
SFO-TX02240705-6389	4/7/2005	1

Wildfires: Extent and Probability

Table BC.8 lists the Fire Intensity Acreage for the Village according to the TxWRAP Community Summary Report. Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of the Characteristic Fire Intensity Scale (FIS).

Table BC.8, Fire Intensity Acreage, Bear Creek, Texas

Class	Acres	Percent
Non-Burnable	130	19.30%
1 (Very Low)	6	1.00%
1.5	22	3.20%
2 (Low)	10	1.50%
2.5	8	1.20%
3 (Moderate)	40	5.80%
3.5	51	7.50%
4 (High)	159	23.50%
4.5	251	37.10%
5 (Very High)	0	0.00%
Total	677	100.00%

Based on 2 reported events in 35 years, the Village of Bear Creek future probability for a wildfire event is approximately once every 17 to 18 years (on average), with up to a potential fire intensity of 4.5 or “High” classification on the TxWRAP FIS.





Wildfires: Impact

Impact on the community can be measured using TxWRAP Housing Density levels within the WUI. Areas with a higher housing and population density, especially areas near burnable fuels, would be affected to a greater extent than rural areas. In the event of a wildfire in high density areas of population, residential structures would be damaged or destroyed, critical infrastructure such as water, sewer and electrical services would be interrupted and residents would experience injury or loss of life. Table BC.9 below lists the population, percent of total population, WUI acreage and percent of WUI acreage for the Village of Bear Creek according to the Texas A&M

Forest Service TxWRAP Community Summary Report.

Table BC.9, WUI Acreage, Village of Bear Creek

Housing Density	WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
LT 1hs/40ac	0	0.0 %	1	0.1 %
1hs/40ac to 1hs/20ac	0	0.0 %	0	0.0 %
1hs/20ac to 1hs/10ac	7	1.2 %	12	1.7 %
1hs/10ac to 1hs/5ac	71	12.3 %	156	23.0 %
1hs/5ac to 1hs/2ac	472	81.9 %	493	72.8 %
1hs/2ac to 3hs/1ac	26	4.5 %	15	2.3 %
GT 3hs/1ac	0	0.0 %	0	0.0 %
Total	576	100.0 %	677	100.0 %

Wildfires: Vulnerability Summary

The Village of Bear Creek has no dedicated fire service. Instead, it is a part of an emergency services district that is shared amongst other communities in the area. There are 159 housing units and few hydrants that are equipped to be used for firefighting, as they are connected to waterlines that could not withstand the pressure used to pump water by fire apparatus. Thus, these hydrants would more accurately be described as pressure relief valves. The community of Bear Creek would benefit from more hydrants for firefighting. The vulnerability to all residential structures is higher due to the limitations on the hydrants.

The Village is entirely residential and many residents chose to keep their acreage as natural as possible. The result is that there are inhabited and vacant lots with an abundance of growth that could act as fuel to wildfires. The closest fire station is the North Hays Fire Rescue and their average response time is 7 minutes.



2.2 Risk Ranking Result

On January 12, 2017, members of the Village of Bear Creek MPC completed a questionnaire as part of the Hays County HMP Update: Risk Assessment. The questions covered the risk associated with the hazards that affect each community based on the level of concern over each profiled hazard, the hazards' impact on health & safety, as well as impact to property and business continuity. The answers from this questionnaire were combined with public survey results on perception of risk. The values from both sources were analyzed using the Halff Risk Ranking Tool (details regarding the risk ranking tool are in Chapter 2, the risk assessment portion of the main plan document). The results provided a quantified ranking of risk, with values ranging from 0 to 100. The results for Village of Bear Creek are shown below (hazard values shown from highest to lowest risk):

Ranking Order	Hazard	Risk Ranking Value
1	Drought	98.6
2	Wildfire	98.4
3	Floods	95.1
4	Tornadoes	90.6
5	Hurricanes/Tropical Storms	77.8
6	Wind Storms	71.7
7	Severe Winter Storms	68.2
8	Extreme Heat	55.2
9	Lightning	49.0
10	Hail Storms	48.9
11	Expansive Soils	37.6
12	Earthquakes	36.4
-	Land Subsidence	Not Profiled
-	Dam/Levee Failure	Not Profiled



Section 3: Mitigation Strategy

This section examines the community's ability to perform mitigation (a review of existing capabilities is shown in Table BC.10) and identifies specific actions to address vulnerabilities for each hazard profiled in the Hays County HMP Update. The mitigation strategy is the application of actions into an approach for performing structural and non-structural mitigation efforts within the jurisdiction. Actions are also prioritized and considered for incorporation into other community programs, regulations, projects or plans.

Completed and canceled actions are also included in a separate section for future reference.

3.1 Existing Capabilities

Table BC.10, Existing Capabilities

Resources Name	Resource Type	Ability to Expand/Improve
Mayor/Emergency Management Coordinator/Floodplain Administrator	Elected Official	Political support and funding for mitigation actions/ Management of Village-level HMP updates/Responsibility for continued participation in the NFIP. Could attend mitigation information session to learn about community risks and mitigation strategy.
Commissioners	Elected Officials	Supplements political support for implementation of mitigation actions. Could attend mitigation information session to learn about community risks and mitigation strategy.
Village Secretary	Village Staff	Support for implementation of mitigation actions. Could attend mitigation information session to learn about community risks and mitigation strategy.
Engineer	Consultant	Expertise in structural mitigation projects and compliance with flood damage prevention ordinance. Attend advanced floodplain management training.
Property Tax	Funding	Provides potential funding for Hazard Mitigation item and cost share for HMA grants.
Chapter 211 of the Local Government Code: Zoning	Authority	Authorizes the Village to regulate Zoning. (State of Texas, 1987) (State level code)
Chapter 213 of the Local Government Code: Municipal Comprehensive Plans		Authorizes the Village to adopt a comprehensive plan for the long-range development of the Village. (State of Texas, 1997) (State level code)
Chapter 214 of the Local Government Code: Municipal Regulation of Housing and Other Structures		Authorizes the Village to have regulatory authority as it related to building code, such as structural integrity and plumbing. (State of Texas, 1995) (State level code)
Ordinance 980514.001- Providing for "The Village of Bear Creek Handbook for Citizens Committee Members"		Establishes the duties, powers and responsibilities of the Citizens Committee. Consideration of how the committee can be used for the advancement of mitigation purposes through involvement in MPC activities. (Village of Bear Creek, 1998)
Ordinance 980416.002- Providing for any VOBC directed work projects to be approved by a majority vote		Establishes how projects, to "repair or develop the roads, drainage ditches, low water crossings, entrances and flood plain control..." and explore how projects to improve flood prone areas can be undertaken using various types of funding. (Village of Bear Creek, 1998)





Resources Name	Resource Type	Ability to Expand/Improve
Ordinance 150619.001- Subdivision Ordinance Amendment	Authority	Authorizes the requirements for subdividing land. (Village of Bear Creek, 2015) Can be enhanced through instituting mitigation standards for safe growth that encourage mitigation.
Ordinance 091221.001- Providing Regulations to Control Outdoor Burning (Amendment)		Amendment- Sets regulations for outdoor burning in village limits. (Village of Bear Creek, 2009) Enhanced to implement wildfire mitigation actions.
Ordinance 0905183.001- Standards for Excavation/ Removal and Alternation of Facilities/Requiring Permits/ Establishing Fees		Gives community authority to charge fees and penalties, that assist in funding for mitigation projects and enforcement. (Village of Bear Creek, 2017) Can be enhanced to further strengthen enforcement ability.
Ordinance 070618.001- Establishing Emergency Management Program		Gives community powers to cope with all phases of emergency management, to include mitigation. (Village of Bear Creek, 2007) Can be referenced to justify mitigation activities.
Ordinance 060821.002- Establishing Driveway Regulation		Gives Village power to require driveway and culvert permitting and standards. (Village of Bear Creek, 2017) Can be amended to increase mitigation of expansive soil hazards.
Ordinance 050919.003- Flood Damage Prevention Ordinance		Provides Village the authority to regulate development as part of floodplain management. (Village of Bear Creek, 2005) Can be amended to adopt higher standards, such as freeboard.
Ordinance 000612.001- Establishes Outdoor Burning Violation		Provides control of outdoor burning. (Village of Bear Creek, 2000) Can increase protection against wildfire risk.
Minimum Standards for Driveway Construction	Standards	Guidance that dictates culvert sizes, and design to minimize adverse impact from flooding. (Village of Bear Creek, 2006)

3.2 National Flood Insurance Program Participation

The Village of Bear Creek participates in the National Flood Insurance Program and has adopted a flood damage prevention ordinance (Village of Bear Creek, 2005), that designates the Mayor the floodplain administrator. There are flood damage mitigation requirements incorporated into other ordinances, such as the subdivision ordinance and driveway construction ordinance. There is not a trained floodplain manager on the Village staff. If and when a floodplain development permit would be submitted, the duties would be contracted out to a consultant. This situation is unlikely, as the community is close to fully developed, however would be required if substantial repairs or improvements were to be made to current structures within the floodplain. The Village will continue to explore options for higher standards and consider application for the Community Rating System. The Village of Bear Creek has a total of 2 NFIP policies in force as of June 2016. This totals \$700,000 in total insurance coverage.

3.3 Mitigation Goals

The plan-level mitigation goals can be found in Chapter 3, the Mitigation Strategy portion of the Hays County HMP. These goals apply to each community and were mutually decided upon as the guiding goals for the development of actions in each jurisdiction.

3.4 Mitigation Actions

Risk Focus is defined as:

*E= Actions reducing risk to existing buildings and infrastructure

*F= Actions reducing risk to new development and redevelopment

Number/Title	Hazard	Item Description	Implementation Agency	
1 Development and Implementation of Flood Insurance Information Campaign (previously action 1 in 2011 plan, modified)	Floods	Promote the flood insurance program to lessen the number of structures uninsured from flood loss by providing citizens access to brochures about the NFIP at the local Volunteer Fire Department.	VOBC Village Secretary	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing village staff and free NFIP materials from FEMA publication warehouse./ In-kind services		60 months	Ongoing	N/A
Cost and Benefit Considerations				
This project would indirectly benefit residents who need information about the hazard at little cost.				
Number/Title	Hazard	Item Description	Implementation Agency	
2 Flood Ordinance Higher Standards (previously action 2 in 2011 plan)	Floods	Create higher standards to increase protection of development in/near the floodplain, increasing freeboard.	VOBC Commissioners	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff with Texas Water Development Board Support/ in-kind services		6 months	Not Started	E/F
Cost and Benefit Considerations				
This project would be a low-cost method of ensuring that new development and substantial improvements are done with less risk for flood damage.				

Hays County Hazard Mitigation Plan, Village of Bear Creek Annex



Number/Title	Hazard	Item Description	Implementation Agency	
3 Local FPA Floodplain Management Training Plan Development and Implementation (previously action 3 in 2011 plan, modified)	Floods	Implement training plan attendance at Texas Water Development Board or Texas Floodplain Management Association classes.	VOBC Village Secretary/Commissioners	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$250/Existing staff/ in-kind services		1 month	Not started	E/F
Cost and Benefit Considerations				
These classes are low-cost/free and range between 4 hours and 4 days. The benefit would be enhanced enforcement of flood damage prevention ordinance.				

Number/Title	Hazard	Item Description	Implementation Agency	
4 Application preparation and submittal for Storm Ready Designation from National Weather Service (previously action 6 in 2011 plan, modified)	Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Hurricanes/ Tropical Storms	Application for designation that classifies community's level of preparedness for severe weather and storms.	VOBC Village Secretary	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		6 months	Not Started	N/A
Cost and Benefit Considerations				
There is a high level of effort to complete the application, however no other cost applies. The level of increased preparedness would benefit the entire population.				

Number/Title	Hazard	Item Description	Implementation Agency	
5 Energy Restore Priority Effort	Extreme Heat, Severe Winter Storms, Lightning, Windstorms, Tornadoes, Hurricane/ Tropical Storms	Plan that provides the energy provider with data on the highest priority energy users who need their power recovered first, due to medical dependencies on power.	VOBC staff and Pedernales Electric Cooperative/Hays County Preparedness	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		6 months	Not Started	N/A
Cost and Benefit Considerations				
This would be a low-cost action that could be lifesaving for the small number of residents that are dependent on their access to electricity for medical purposes.				

Hays County Hazard Mitigation Plan, Village of Bear Creek Annex

Number/Title	Hazard	Item Description	Implementation Agency	
6 Development and Implementation of Natural Hazard Mitigation Awareness Program (previously action 8 in 2011 plan, modified)	Drought, Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Expansive Soils, Floods, Hurricanes/Tropical Storms, Earthquakes, Wildfires	Publication of hazard mitigation awareness materials for residents from HaysInformed.com referenced on Village of Bear Creek website.	VOBC Village Secretary	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ in-kind services		1 month	Not started	N/A
Cost and Benefit Considerations				
Although this effort does not directly benefit the community in a quantifiable way, the cost is only the man hours to add the link to a website. The County hosts HaysInformed.com and ensures the validity and accuracy of the information shared.				
Number/Title	Hazard	Item Description	Implementation Agency	
7 Development, Adoption and Implementation of Drought Contingency Plan (combined--previously actions 10/11 in 2011 plan, modified)	Drought	Draft plan to document activities to institute drought stage triggers for water preservation enforcement.	VOBC Village Secretary/ Commissioners	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		12 months	Not started	N/A
Cost and Benefit Considerations				
This low cost monitoring and inclusion of drought water conservation measures will take more time than money to institute and could save the community from a water shortage. All residents that use the water source would benefit.				
Number/Title	Hazard	Item Description	Implementation Agency	
8 Sanding Contract Research/ Plan Development (previously action 13 in 2011 plan)	Severe Winter Storms	Creation of a plan that provides established procedures and negotiated service providers and rates for sanding.	VOBC Village Secretary, VOBC Commissioners	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		12 months	Not started	N/A
Cost and Benefit Considerations				
By setting rates for sanding for extreme cases of icy weather, the whole community could save money on potential price increases.				

Hays County Hazard Mitigation Plan, Village of Bear Creek Annex

Number/Title	Hazard	Item Description	Implementation Agency	
9 Enhancement of Large-Item Pick-up Event to promote brush clean-up (previously action 14 from 2011 plan, modified)	Lightning, Wildfire	Marketing effort to encourage brush cleanup during existing Large-Item Pickup Event hosted by trash service.	VOBC Village Secretary	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		6 months	Not started (enhancement of existing program)	N/A
Cost and Benefit Considerations				
By emphasizing the need to protect from wildfires, an unknown number of residents could benefit slowing the spread of fire through brush clean-up.				

Number/Title	Hazard	Item Description	Implementation Agency	
10 Low Water Crossing Protection Plan	Floods	Documented project plan to define low water crossings that need to be repaired, retrofitted and establish maintenance schedule/procedures.	VOBC Commissioners, VOBC Village Secretary, Contracted Engineers	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff, cost of engineer support for plan/ in-kind services		12 months	Not started	E
Cost and Benefit Considerations				
Documentation of a plan to mitigate the risks of low water crossings, to the benefit of the safety of residents who drive along the Bear Creek roads.				

Number/Title	Hazard	Item Description	Implementation Agency	
11 Watershed Review Program for Encroachments (previously action 17 in 2011 plan, modified)	Floods	Plan for how to enforce against encroachments in the floodway by creating a program to coordinate inspections.	VOBC Commissioners	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		6 months	Not started	E
Cost and Benefit Considerations				
This effort of enforcement will protect downstream properties and protect the community from liability from encroachments that create adverse impact to neighbors. Although benefits are unquantifiable at this point, the cost is low enough for it to be negligible.				



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Number/Title	Hazard	Item Description		Implementation Agency	
12 Low-water crossing mitigation (previously action 18 in 2011 plan, modified)	Hurricanes/ Tropical Storms, Floods, Wildfire	Elevated low-water crossing at community ingress point. Increases safety of evacuation route.		VOBC Commissioners	
Cost Estimate/Funding			Schedule	Status as of 2017	*Risk Focus:
Existing staff, possible cost of buy out for an easement of land to develop an additional emergency exit for the community/ in-kind services			18 months	Not started	N/A
Cost and Benefit Considerations					
The cost of not establishing an alternate route out of the community would greatly outweigh the cost of mitigating this risk of not being able to evacuate.					

Number/Title	Hazard	Item Description	Implementation Agency	
13 ERCOT App Download Event	Severe Winter Storms, Extreme Heat	Promoting VOBC residents to download the Electric Reliability Council of Texas app (via Facebook promotion and website link) in order to receive alerts for reducing energy usage to keep from grid failure.	VOBC Village Secretary	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		1 month	Not started	N/A
Cost and Benefit Considerations				
This low-cost effort will increase awareness for all residents who use electricity from the Texas grid via Pedernales Electric Co-operative.				

Number/Title	Hazard	Item Description	Implementation Agency	
14 Purchase and install weather radios for all public facilities	Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Floods, Hurricanes/Tropical Storms, Earthquakes, Wildfires	Installing weather radios at Bear Creek public facilities.	VOBC Commissioners, VOBC Village Secretary, Bear Creek Oaks Subdivision Property Owners Association	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$500/General Fund		6 months	Not started	N/A
Cost and Benefit Considerations				
The minimal cost of these radios would be beneficial to all citizens who receive information from the local government.				



Hays County Hazard Mitigation Plan, Village of Bear Creek Annex

Number/Title	Hazard	Item Description	Implementation Agency	
15 Adoption of Procedure for Instituting Rainwater Harvesting Systems For Future Public Structure Construction	Drought	Although the Village has no public structures, the community will adopt procedures to incorporate Rainwater Harvesting systems to future public structures.	VOBC Commissioners	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
In-kind services		6 months	Not started	N/A
Cost and Benefit Considerations				
This effort would assist people in cost saving measures to harvest their own rainwater and would benefit the natural sources of water, so that all who access the aquifer would benefit from conservation efforts.				

Number/Title	Hazard	Item Description	Implementation Agency	
16 Enhancement and Adoption of Enhanced Driveway Ordinance	Expansive Soils	Enhancement to the existing Minimum Standards for Driveway Construction Guidelines for higher soil compaction levels.	VOBC Commissioners/ Contracted Engineers	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services, cost of engineer support		6 months	Started with publication of Minimum Standards for Driveway Construction	F
Cost and Benefit Considerations				
This recommendation to enhance an existing document would add a level of protection to future development of driveways so that they mitigate against expansive soil damage.				

Number/Title	Hazard	Item Description	Implementation Agency	
17 Development and Implementation of Emergency Communications-Phone Tree Plan Document (previously action 4 in 2011 plan)	Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Floods, Hurricanes/Tropical Storms, Earthquakes, Wildfires	Manual call-down procedures and data for this small town to do emergency messaging to residents in cases during which County resources aren't available to do so for them.	VOBC Village Secretary/ Commissioners	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/volunteers/in-kind services		6 months	Not started	N/A
Cost and Benefit Considerations				
This would provide a low-cost manual method to reach all residents in a way that is not currently possible.				




3.5 Capabilities Assessment

Evaluation/Prioritization of Actions

Each action added to the plan was developed using the Mitigation Action Summary Worksheet shown in Figure BC.8.

Figure BC.8, Mitigation Action Summary Worksheet



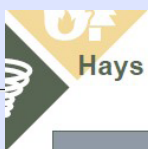
Hays County Hazard Mitigation Plan Update Process

Mitigation Action Summary Worksheet

Community Name:

Person completing questionnaire:

Mitigation Action/ Project Title	
Background/ Issue	
Opportunities for Integration	
Responsible Agency	
Partners	
Strategy for Existing Structures	



Hays County Hazard Mitigation Plan Update Process

Mitigation Action Summary Worksheet

Strategy for Future Development	
Potential Funding	
Cost Estimate (Values from "Measuring Costs" fields from Benefit and Cost Review Worksheet)	
Benefits (Statements from the "Difference" fields on the Benefit and Cost Review Worksheet)	
Timeline	
Priority (Based off Priority worksheet)	



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Table BC.11, Mitigation Action Prioritization Tool (with Hazards in order of highest priority to lowest)

Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community	Risk Ranking Score	Total Score
6. Natural Hazard Awareness Program	0	0	1	0	0	0	1	0	0	0	99	101
14. Weather Radio Programming Class	1	1	1	0	0	0	0	0	0	0	98	101
15. Rainwater Harvesting Education Program	0	0	1	0	0	1	0	0	0	0	99	101
7. Drought Monitoring Program	0	0	0	0	0	0	0	0	0	0	99	99
9. Enhancement of Large-Item Pick-up Event to promote brush Cleanup	0	1	0	0	0	0	0	0	0	0	98	99
12. Evacuation Plans/Alternate road consideration	1	0	0	0	0	0	0	0	0	0	98	99
17. Emergency Communications Plan- Phone Tree	1	1	0	0	0	0	0	-1	0	0	98	99
1. Flood Insurance Information Campaign	0	1	1	0	1	0	0	0	-1	0	95	97.1
2. Flood Ordinance Higher Standards	0	1	0	0	1	0	0	0	0	0	95	97.1
10. Low Water Crossing Protection Plan	0	1	0	1	0	0	0	0	0	0	95	97
11. Watershed Review Tour for Private Dams/Encroachment Enforcement	0	0	1	0	0	0	0	0	0	0	95	96
4. Storm Ready Designation from National Weather Service	0	0	0	0	0	0	0	0	0	0	95	95
3. Floodplain Management Training	0	0	0	0	0	0	0	-1	0	0	95	94.1
5. Energy Restore Priority Effort	1	0	-1	0	0	0	1	-1	0	0	90	90
8. Sanding Contract Research/ Plan Development	1	0	0	1	0	0	0	0	0	0	68	70
13. ERCOT App Download Event	0	0	1	0	0	0	0	0	0	0	55	56
16. Soil Compaction Recommendation to Enhance Driveway Guidelines	0	0	1	0	0	0	0	0	0	0	38	39



Hays County Hazard Mitigation Plan, Village of Bear Creek Annex

Mitigation Actions by Hazard

The mitigation actions are shown with corresponding hazards in Table BC.12 below.

Table BC.12, Mitigation Action Impact, Village of Bear Creek

Action Number	Drought	Extreme Heat	Severe Winter Storms	Lightning	Hailstorms	Windstorms	Tornadoes	Expansive Soils	Floods	Land Subsidence	Hurricanes/Tropical Storms	Earthquakes	Dam/Levee Failure	Wildfire
1									X					
2									X					
3									X					
4			X	X	X	X	X				X			
5		X	X	X		X	X				X			
6	X	X	X	X	X	X	X	X	X		X	X		X
7	X													
8			X											
9				X										X
10									X					
11									X					
12									X		X			X
13		X	X											
14		X	X	X	X	X	X		X		X	X		X
15	X													
16								X						
17		X	X	X	X	X	X		X		X	X		X



3.6 Integration Efforts

Table BC.13 captures ways that the HMP risk assessment, mitigation goals and actions can be integrated into other Village of Bear Creek documents, programs and regulations.

Table BC.13, Plan Integration Efforts, Village of Bear Creek

Name of Document	Type	Item Type	Process for Integration
Minimum Standards for Driveway Construction	Regulations	Action	Drafting addition of soil compaction recommendation for driveway construction in order to lessen the impact of potential expansive soils. Submission of these recommendations to the Village Commission for adoption, according to Commission procedures.
Village of Bear Creek Website/Facebook	Outreach Program		Use current VOBC outreach methods online to promote actions to promote natural hazards awareness (through HaysInformed.com), monitor drought data, monitor times of conservation for energy through ERCOT, emergency communications phone tree creation, rainwater harvesting educational materials, flood insurance information, evacuation plans, energy prioritization registration for medical needs, weather radio programming educational opportunities and events promoting brush pickup/clean up. Submission of changes to community website manager.
Flood Damage Prevention Ordinance	Regulation		Consult with engineering consultant to advice on the addition of higher standards to flood damage prevention ordinance and associate to encroachment review procedures. Submission of recommendations to the Village Commission for adoption, according to Commission procedures.
Village of Bear Creek Plans of Proposed Street Improvements	Plan		Add low water crossing protection plan efforts to current plans for 2017 road resurfacing projects in order to meet mitigation needs while working on existing project. This would include replacing undersized culverts during road replacement effort. Ensure this incorporation through the inclusion of MPC members within the planning effort.
Ordinance 980514.001- Providing for "The Village of Bear Creek Handbook for Citizens Committee Members"	Regulation	Goal	Update/amend the goals of the Citizens Committee in order to incorporate a mission for hazard awareness and education in their official guiding document. Include a member of the Citizens Committee as a stakeholder for the MPC, through formal invitation to future MPC planning meetings.



Hays County Hazard Mitigation Plan, Village of Bear Creek Annex

Table BC.13, Plan Integration Efforts, Village of Bear Creek, (cont.)

Name of Document	Type	Item Type	Process for Integration
Hazard Mitigation Grant Program (HMGP)	Funding	Action	<p>Identify actions that can be funded through new and existing grant awards. Review existing mitigation actions for eligibility for the grant program, to include Benefit Cost consideration. Prepare grant application documents in advance to prepare for future grant periods.</p> <p>Process involves identification of actions from Plan; obtaining Council approval to apply; notification of interest in grant to the public; completion of application for funding; if awarded, obtaining Council approval to accept; if accepted, administration of funds and implementation of project.</p>
Pre-Disaster Mitigation (PDM)	Funding	Action	<p>Identify actions that can be funded through new and existing grant awards. Review existing mitigation actions for eligibility for the grant program, to include Benefit Cost consideration. Prepare grant application documents in advance to prepare for future grant periods.</p> <p>Process involves identification of actions from Plan; obtaining Council approval to apply; notification of interest in grant to the public; completion of application for funding; if awarded, obtaining Council approval to accept; if accepted, administration of funds and implementation of project.</p>
Flood Mitigation Assistance (FMA)			
TWDB Flood Protection Planning (FPP) Grant			<p>Identify actions that can be funded through new and existing loan programs. Review existing mitigation actions for eligibility for the loan program, to include Benefit Cost consideration. Prepare loan application documents in advance to prepare for future loan periods.</p> <p>Process involves obtaining Council approval to apply; notification of interest in loan to the public; completion of application for loan; if awarded, obtaining Council approval to accept; if accepted, administration of funds and implementation of project.</p>
TWDB Clean Water State Revolving Fund (CWSRF)			
Texas Water Development Fund (DFund)			



Incorporation Achievements Since Previous Plan Update

Data, information, and mitigation goals and actions were not integrated into other planning mechanisms in the last 5 years prior to this update due to a lack of funding and resources.

Section 4: Finalize Plan Update (Review, Evaluation and Implementation)

4.1 Changes in Development

The Village of Bear Creek's only changes in development have been remodels of existing structures. None were substantially improved and none were located in the Special Flood Hazard Area. There have been no other types of development. Any future build within the community will be residential. The community is nearing full development with over 90% having been built out. Vulnerability to natural hazards has neither increased or decreased as a result of development in Bear Creek.

4.2 Progress in Mitigation Efforts

Past Mitigation Action Progress Reports Summary - Completed and Canceled

2011 Action Number	Hazard	Title	Lead Department
5	All hazards	Development and maintenance of Countywide and individual community HMP plans	Village of Bear Creek
Cost Estimate/Funding		Schedule	Status as of 2017
Existing Staff Resources		Original plan adopted on April 20, 2004- update in 2011	Canceled. No longer an objective for the community.
Cost Effectiveness			
Not independently cost-effective			

2011 Action Number	Hazard	Title	Lead Department
7	Extreme Heat	Reduce Impacts of Extreme Heat on Elderly, Disabled, Low-Income and Infants.	Hays County OEM
Cost Estimate/Funding		Schedule	Status as of 2017
\$2,000 to purchase and distribute 100 box fans \$3,000 estimated cost for a/c repairs; Funding source: United Way, Rotary Clubs, Lions Clubs, Red Cross, Churches and charitable organizations, Power Companies		Periods of Extreme heat; May be annually	Canceled. Not a jurisdiction specific project.
Cost Effectiveness			
Not independently cost-effective			

2011 Action Number	Hazard	Title	Lead Department
9	Wildfire	Map Wildfire Hazard Areas	Village of Bear Creek
Cost Estimate/Funding		Schedule	Status as of 2017
\$500		TBD; likely initiated in 2011	Canceled. Firewise efforts from Hays County are meeting this need and the Texas Wildfire Risk Assessment Portal also provides this data for free.
Cost Effectiveness			
Not independently cost-effective, but essential in minimizing loss of life and injuries during significant events.			



Hays County Hazard Mitigation Plan, Village of Bear Creek Annex

2011 Action Number	Hazard	Title	Lead Department
12	Extreme heat	Evaluate Excess Heat Risks	Village of Bear Creek
Cost Estimate/Funding		Schedule	Status as of 2017
No additional cost- uses existing staff resources		TBD; probably initiated in 2011	Canceled. Number of high risk residents is low and this hazard is not a high priority.
Cost Effectiveness			
Not independently cost effective, but needed to develop risk reduction efforts			

2011 Action Number	Hazard	Title	Lead Department
15	Tornadoes, thunderstorm, wind, winter storm, hail, seismic	Upgrades to at-risk structures	Village of Bear Creek
Cost Estimate/Funding		Schedule	Status as of 2017
Varies depending on measure. Funding from General Fund or FEMA grant program/s		TBD based on study	Canceled. Not a feasible action for a community of this size.
Cost Effectiveness			
Cost-effectiveness will vary with level of risk and project cost			

2011 Action Number	Hazard	Title	Lead Department
16	Tornadoes, thunderstorm, wind, winter storm, hail, seismic	Structural/Engineering Study for Bear Creek Public facilities to ensure soundness	Village of Bear Creek
Cost Estimate/Funding		Schedule	Status as of 2017
To be determined, but if initiated probably from General Fund		Not yet established- to be commenced only if funding is available	Canceled. The Village of Bear Creek has 0 public facilities. Their village hall is run out of the homes of the elected officials and village secretary.
Cost Effectiveness			
Not independently cost-effective but the initial step in identifying appropriate mitigation measures			

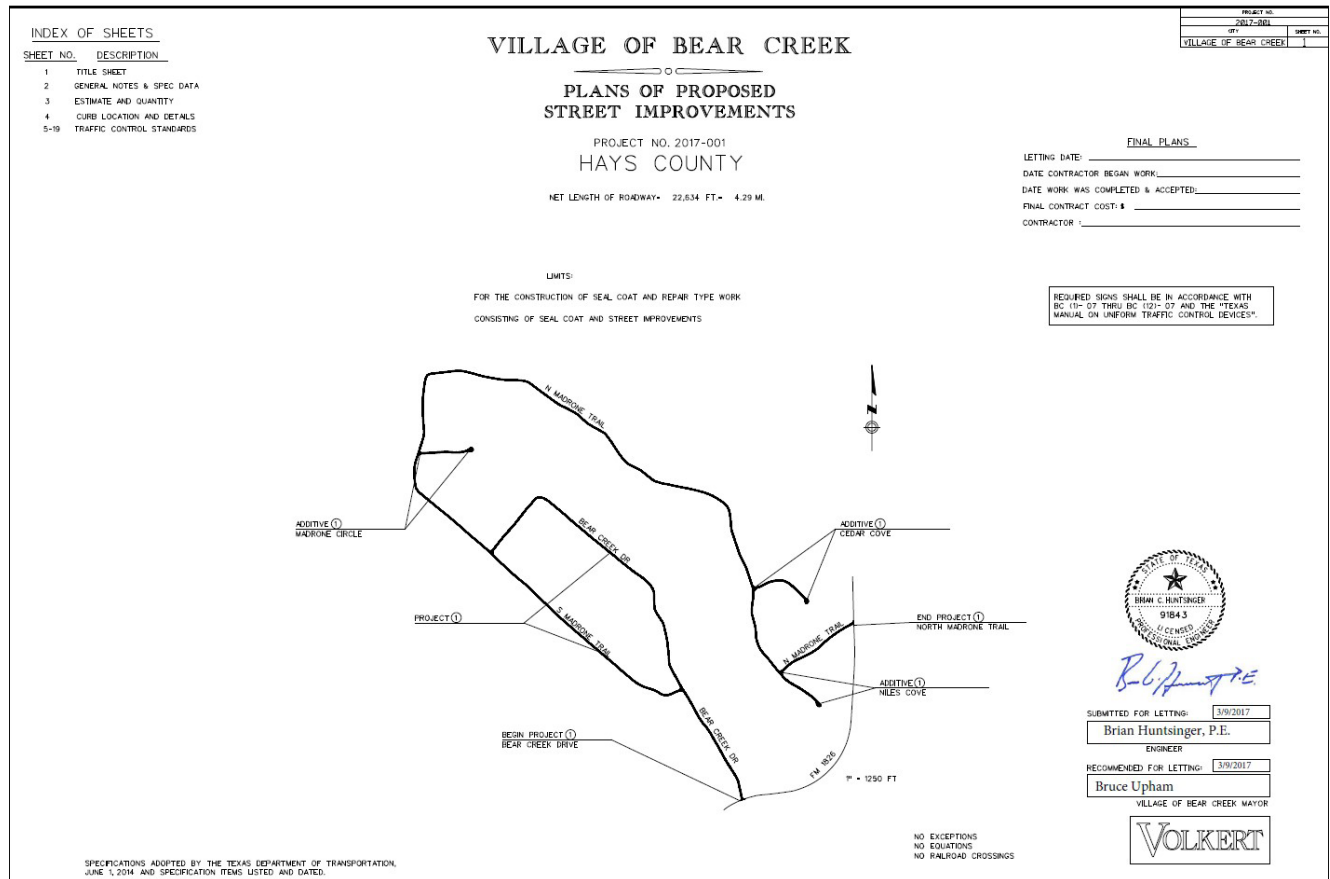
4.3 Changes in Priorities

Plan-level priority changes are reflected in the changes to the plan-level goals shown in Chapter 3: Mitigation Strategy within the Main Plan document. Since the last mitigation plan update, the Village of Bear Creek has shifted focus and priorities toward road resurfacing efforts and culvert maintenance in the community. This has resulted in the initiation of a new project to improve the community roads in 2017. In addition, the Village is focused on supporting the Bear Creek citizens as they work through the introduction of new FEMA Flood Insurance Rate Maps.



Hays County Hazard Mitigation Plan, Village of Bear Creek Annex

Figure BC.9, Village of Bear Creek Street Improvement Plans





Section 5: Approval and Adoption

5.1 Approval and Adoption Procedure

The procedures for approval and adoption are described in Chapter 4.1 of the Hays County HMP Update.

Table BC.14, Municipal Jurisdiction Adoption Date

Municipality	APA Date	Adoption Date
Village of Bear Creek		

Jurisdiction Adoption Documentation Placeholder

References

- (2013). Groundwater depletion in the United States (1900–2008). Reston, VA: U.S. Geological Survey. Retrieved from USGS: <https://pubs.er.usgs.gov/publication/sir20135079>
- National Fire Protection Association. (2013, June). NFPA News & Research. Retrieved from Lightning Fires and Lightning Strikes: <http://www.nfpa.org/news-and-research/fire-statistics-and-reports/fire-statistics/fire-causes/lightning-fires-and-lightning-strikes>
- National Highway Traffic Safety Administration. (2017, 03 11). Traffic Safety Facts. Retrieved from Texas 2011-2015: <https://cdan.nhtsa.gov/SASStoredProcess/guest>
- National Oceanic and Atmospheric Administration. (2016). Historical Hurricane Tracks. Retrieved from National Oceanic and Atmospheric Administration Coastal Management: <https://coast.noaa.gov/hurricanes/>
- National Oceanic and Atmospheric Administration Storm Event Database. (2016, 12 01). National Centers for Environmental Information. Retrieved from Data Access: <https://www.ncdc.noaa.gov/data-access>
- State of Texas . (1995, 08 28). Texas Constitution and Statutes. Retrieved from Local Government Code-Title 7. Regulation of Land Use, Structures, Businesses and Related Activities, Subtitle A. Municipal Regulatory Authority, Chapter 214 Municipal Regulation of Housing and Other Structures: <http://www.statutes.legis.state.tx.us/Docs/LG/htm/LG.214.htm>
- State of Texas. (1987, 09 1). Texas Constitution and Statutes. Retrieved from Local Government Code-Title 7. Regulation of Land Use, Structures, Businesses and Related Activities, Subtitle A. Municipal Regulatory Authority, Chapter 211 Municipal Zoning Authority, Subchapter A General Zoning Regulations: <http://www.statutes.legis.state.tx.us/SOTWDocs/LG/htm/LG.211.htm>
- State of Texas. (1997, 09 01). Texas Constitution and Statutes. Retrieved from Local Government Code-Title 7. Regulation of Land Use, Structures, Businesses and Related Activities, Subtitle A. Municipal Regulatory Authority, Chapter 213 Municipal Comprehensive Plans: <http://www.statutes.legis.state.tx.us/Docs/LG/htm/LG.213.htm>
- Texas A&M Forest Service. (2016, 12 01). Wildfire Risk Assessment Portal. Retrieved from Public Viewer: <https://www.texaswildfirerisk.com/>
- Texas Department of Transportation. (2017, 03 11). Crash Records Information System. Retrieved from C.R.I.S Query: <https://cris.dot.state.tx.us/public/Query/#/public/welcome>
- Texas Natural Resources Information System. (2011). TNRIIS Data Catalog Low Water Crossings. Retrieved from TNRIIS: <https://tnris.org/data-catalog>
- USGS Earthquake Hazard Program. (2015). USGS Earthquakes Hazard Program. Retrieved from USGS: <https://earthquake.usgs.gov/data/>
- Village of Bear Creek . (----, - --). Village of Bear Creek Uploads. Retrieved from Driveway Permit Process: http://vilbc.org/wp-content/uploads/DRIVEWAY_PERMIT_PROCESS.pdf
- Village of Bear Creek . (2017, 03 15). Village of Bear Creek Uploads. Retrieved from Ordinance 0905183.001: <http://vilbc.org/wp-content/uploads/ORD0905183.001.pdf>
- Village of Bear Creek. (1998, 05 14). Village of Bear Creek Uploads. Retrieved from Ordinance 980514.001: <http://vilbc.org/wp-content/uploads/ORD980514.001.pdf>
- Village of Bear Creek. (1998, 04 16). Village of Bear Creek Uploads. Retrieved from Ordinance 980416.002: <http://vilbc.org/wp-content/uploads/ORD980416.002.pdf>
- Village of Bear Creek. (2000, 06 12). Village of Bear Creek Uploads. Retrieved from Ordinance 000612.001: <http://vilbc.org/wp-content/uploads/ORD000612.001.pdf>
- Village of Bear Creek. (2005, 09 19). Village of Bear Creek Uploads. Retrieved from Ordinance

- 050913.003: <http://vilbc.org/wp-content/uploads/ORD050913.003.pdf>
- Village of Bear Creek. (2006, 01 01). Village of Bear Creek Uploads. Retrieved from Minimum Standards for Driveway Construction: <http://vilbc.org/wp-content/uploads/VOBC-DrivewayCulvert-MinStandards.pdf>
- Village of Bear Creek. (2007, 06 18). Village of Bear Creek Uploads. Retrieved from Ordinance 070618.001: <http://vilbc.org/wp-content/uploads/ORD070618.001.pdf>
- Village of Bear Creek. (2009, 12 21). Village of Bear Creek Uploads. Retrieved from Ordinance 091221.001: <http://vilbc.org/wp-content/uploads/ORD091221.001.pdf>
- Village of Bear Creek. (2013, 12 02). Village of Bear Creek Uploads. Retrieved from Well Monitoring Data: <http://vilbc.org/wp-content/uploads/well.pdf>
- Village of Bear Creek. (2015, 06 19). Village of Bear Creek Uploads. Retrieved from Ordinance 150619.001: <http://vilbc.org/wp-content/uploads/ORD150619.001-Subdivision-Ordinance.pdf>
- Village of Bear Creek. (2017, 03 15). Village of Bear Creek Uploads. Retrieved from Ordinance 060821.002: <http://vilbc.org/wp-content/uploads/ORD060821.002.pdf>

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City of Buda
Hays County Hazard
Mitigation Plan Update
2018



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City of Buda Annex

Section 1: Organize and Review

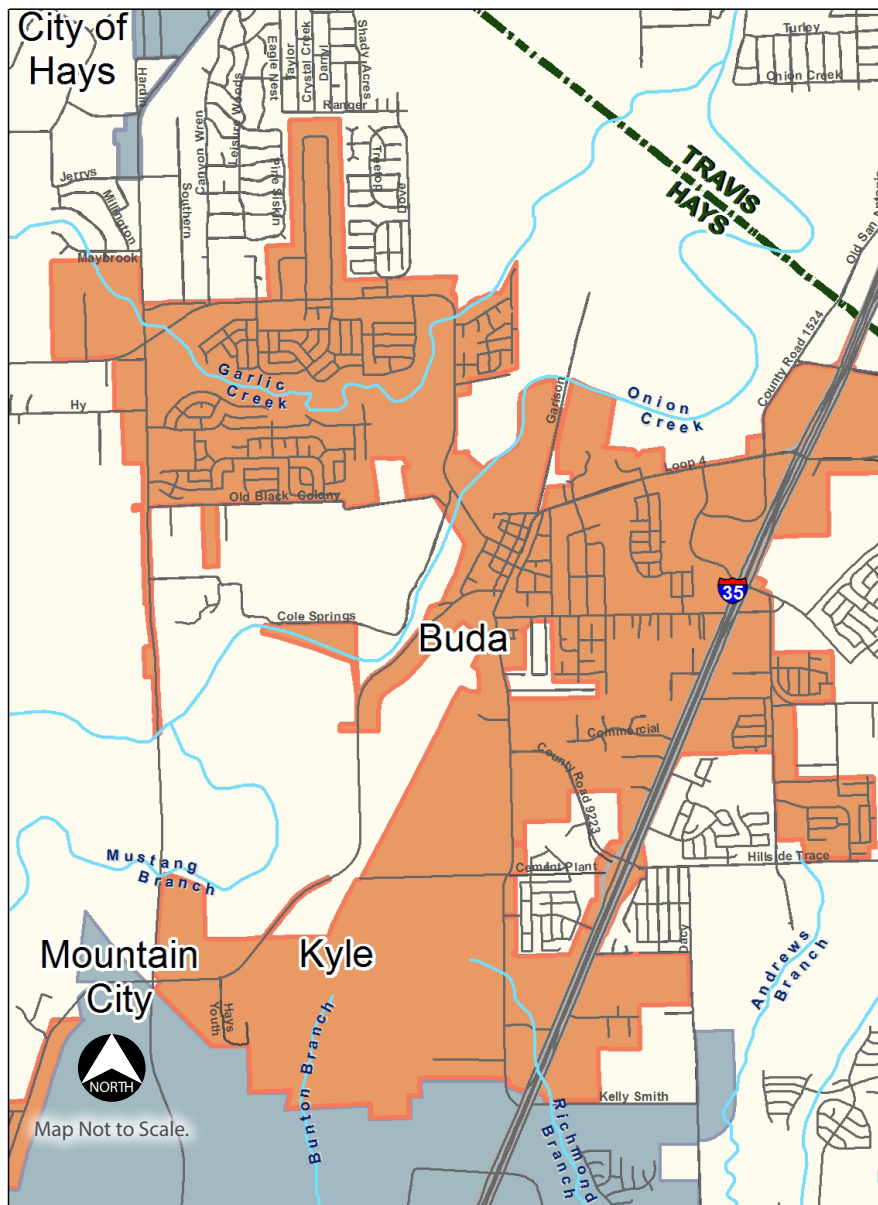
This section contains a brief description of the City of Buda and its jurisdictional features. In addition, Section 1 contains the following details regarding Buda's:

- participation in the Hays County HMP Update process,
- stakeholder engagement,
- public outreach strategy,
- incorporation efforts and
- plan maintenance procedures.

*Population :	7,959
Size of Community:	8.8 sq. miles
*Population over 65 years old	527
*Population under 16 years old	2,414
*Economically Disadvantaged Population (\$0-\$20k)	284
Buda is serviced by the following responders:	
Fire & EMS - Buda Fire Department/Buda EMS	
Law Enforcement- Buda Police Department	

**HAZUS-MH 3.2 Updated Census 2010 Population Estimates*

Figure BA.1, City of Buda Planning Area



1.1 Community Description

When planning, it is important to take into account the characteristics that make a community unique. Consideration of unique needs when it comes to mitigating or recovering from natural hazards ensures that all members of the community and their needs are addressed.

Buda is located along Interstate Highway 35 (IH-35) and State Highway 45 (SH-45), just 20 minutes from both downtown Austin and Austin-Bergstrom International Airport. The population in Buda has grown over 205% percent from 2000 to 2010. With more parkland per-capita than any City in the State, Buda is known as the Outdoor Capital of Texas.

The City is served by Hays Consolidated Independent School District (ISD), which has 22 campuses throughout Buda and Kyle. There are also 4 private schools that serve Buda, one of which is located within the jurisdictional boundaries.

There are over 15 subdivisions that will host more than 4,800 homes once buildout is complete. In 2013 alone, the City approved



Hays County Hazard Mitigation Plan, City of Buda Annex

456 new residential building permits. Incorporated in 1948, Buda is a Home Rule City that has a council-manager form of government (Buda Economic Development Corporation, 2017). Buda's major employers are shown in Table BA.1 and BA.2 shows the City's utility providers.

Table BA.1, Major Employers

Business Type	Name of Employer
Manufacturing	Texas Lehigh Cement
Manufacturing	Centex Materials
Manufacturing	CTX Builders Supply
Manufacturing	Chatleff Controls
Manufacturing	Nighthawk Foods
Retail	Cabela's

Table BA.2, Utility Providers

Type	Provider
Electric	Pedernales Electric Cooperative (PEC)
Water	The City of Buda, Goforth Water Supply Corp, Southwest Water Utilities, LP (Monarch Water)

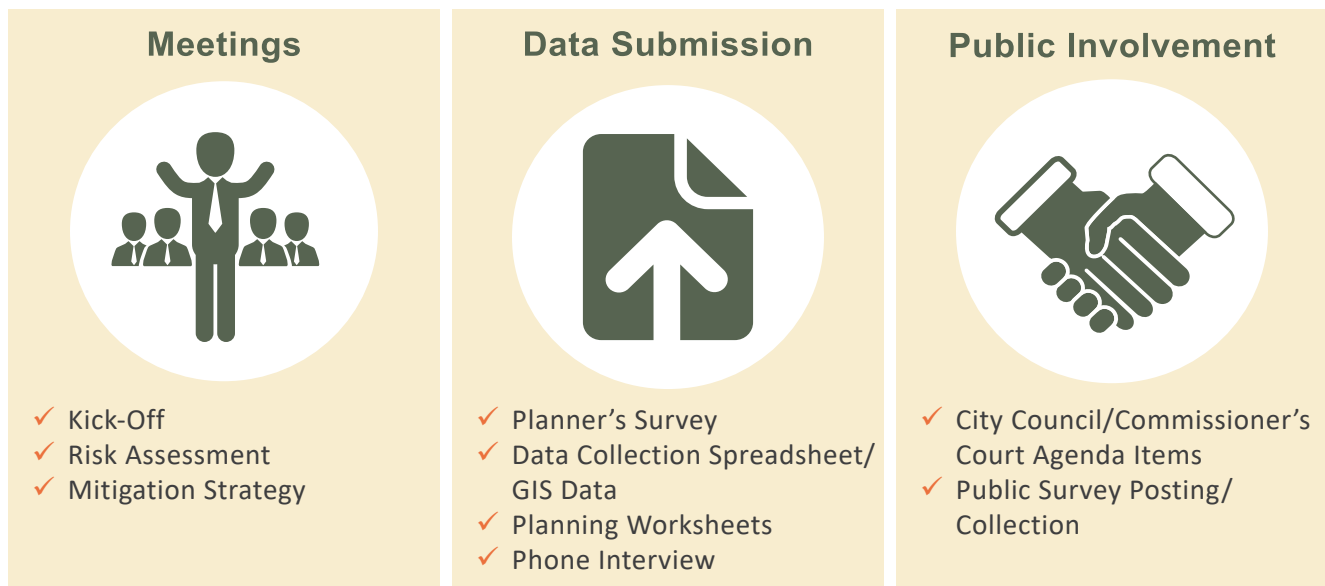
(Buda Economic Development Corporation, 2017)

Community Planning Involvement

MPC planning activities for the Hays County Hazard Mitigation Plan (HMP) Update are captured in Figure BA.2, which utilizes check-marks to indicate each of the activities that were completed by Buda MPC members.

The City of Buda participated in planning activities with their engineering consultants from HDR, Inc. Representatives from the City offices and the consulting firm were present for each meeting and completed each community task within the requested time period.

Figure BA.2, City of Buda Plan Participation





1.2 Outreach Strategy

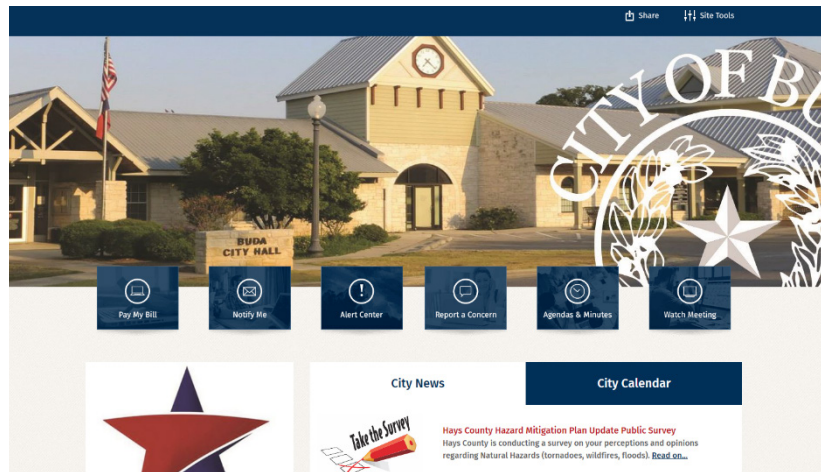
The City of Buda was very active in the following outreach activities used to request public participation in the Hays County Hazard Mitigation Plan Update.

Public Survey Promotion

Buda advertised the Hays County Hazard Mitigation Plan Update Public Survey on the Buda homepage www.ci.buda.tx.us.

As of March 10, 2017, Buda had 242 residents respond to the public survey. Details on how the survey data was directly incorporated into the risk ranking process for hazards is included in Chapter 2, the risk assessment portion of the main plan document.

Figure BA.3, Survey Link on City of Buda Home Page



City Council Meeting Announcement

On February 7, 2017, the City of Buda's Emergency Management Coordinator presented information on the Hays County Hazard Mitigation Plan Update to the Buda City Council. During the presentation, the Council was given a staff report executive summary of the effort, the background/history of mitigation planning, and pros and cons of the activity. Elected officials, local agency leaders and members of the public attended the meeting. The Council agenda and item report for this presentation are included in Plan Appendix A. The Buda City Council members were also provided a copy of the MPC published Hazard Mitigation Plan Update Newsletter that was published at each phase of the process.

Plan Phase Newsletters

The City of Buda was provided with newsletters at each phase of the planning process in order to be able to share updates with stakeholders, elected officials, City staff, and the public. Copies of the newsletter can be found in Plan Appendix A.

Plan Draft Public Review and Comment Period

The link to the draft Hays County HMP Update (hosted on the Hays County page) was posted on the City of Buda website and announced in the Hays Free Press, with an open comment period from July 12, 2017 until July 26, 2017. A hard copy was placed in the Buda Public Library. No public comments were received during this review period, however revision requests were received from Buda City Councilmembers. These revisions were incorporated into the draft.

1.3 Incorporation of Sources

In addition to stakeholder and public input, the MPC also reviewed other City planning resources that could provide useful information for the plan update process. Table BA.3 lists the documents reviewed and how they were considered for incorporation in the updated plan.

Hays County Hazard Mitigation Plan, City of Buda Annex



Table BA.3, Review/Incorporation of Sources

Name of Document	Type	How Incorporated
2013 State of Texas Hazard Mitigation Plan	Plan	Utilized hazard definitions and hazard classification names into risk assessment portion of Buda Annex. (Texas Division of Emergency Management, 2013)
Flood Insurance Study	Study	Incorporated best available hydraulic and hydrologic study results for flood hazard profile.
Repetitive Flood Damage Data	Report	Used flood damage reports to profile structures/addresses that show trends in experiencing flood damage for Risk Assessment Flood Hazard Profile. (National Flood Insurance Program, 2016)
Buda 2030 Comprehensive Plan	Plan	Use of the Guiding Values: Environmental Protection - being stewards of the environment. Responsible Planning - planning for civic infrastructure and services in advance of growth. Livability for All - ensuring that someone can live his or her entire life in Buda.
		Future Land Development Character Districts - Considered mitigation measures that can be applied to the community future development districts.
		Incorporation of the objectives: <ul style="list-style-type: none"> • Preserve open space assets throughout the area. • Protect Buda's environmental quality and identity by preserving the existing "urban forest". • Protect established neighborhoods. • Utilize innovative methods for water and wastewater services and facilities in order to meet or surpass State and Federal standards (reduce amount of City potable water used for irrigation). (Halff Associates, 2011)
Buda 2014 ISO Benchmark Report	Report	Incorporation of actions that also serve mitigation purposes: <ul style="list-style-type: none"> • Action P-7.2 - Develop staff expertise to manage the community's trees, enforcement of tree care ordinance and materials to educate residents as to the importance of...proper tree care (mitigates wildfire, windstorm, severe winter). p. 123 • Action CF-3.4 - Establish a Neighborhood Services program to provide support services and materials to neighborhoods (Mitigates multi-hazards through awareness/education opportunities). (Halff Associates, 2011)
		Review of the report for opportunities to improve Insurance Services Office (ISO) ratings while also instituting mitigation actions. (Rating of 6 for 1-family and 2-family residential and 4 for commercial and industrial) <ul style="list-style-type: none"> • Buda received a 0 for the lack of adoption of a Wildland Urban Interface Code for Commercial and Residential Development. • The Code Enforcement personnel training score could be improved to meet State and National averages through technical training. This could be achieved through introductory Floodplain Management courses. (ISO Building Code Effectiveness Grading Schedule (BCEGS), 2014)

Table BA.3, Review/Incorporation of Sources, (cont.)

Name of Document	Type	How Incorporated
Master Transportation Plan	Plan	<p>Review of problem areas defined by public survey results included in Transportation Master Plan.</p> <ul style="list-style-type: none"> Bradford Village - Goforth and Bonita Vista are in poor condition with potholes and flooding issues. Creekside Park - Rebel Rd/Main needs road repairs and has drainage problems. Creekside Park - Large oak tree on FM 967 doesn't allow for emergency access. Ingress/egress problems at 4 subdivisions; Oxbow Trails, Garlic Creek, Coves of Cimarron and Creekside Park. Whispering Hollow - getting out of Whispering Hollow to FM 1626 needs access to Old Black Colony. <p>(Lockwood, Andrews & Newnam, Inc., 2013)</p>
City of Buda Drainage Master Plan: Phase 1	Plan	<p>Inclusion of goals:</p> <ul style="list-style-type: none"> Consolidate prior piecemeal watershed plans/projects. Assess concerns related to City's rapid growth. Address residents' complaints. Solve problems arising from 2013 Halloween Day Flood. <p>(Lockwood, Andrews & Newnam, Inc., 2014)</p>
		<p>Use of top 10 flooding problem areas for identifying flood location</p> <ul style="list-style-type: none"> West Goforth Street Area Flooding Fire Station Area Flooding Houston Street Area Flooding West Lifschutz Area Flooding Hillside Terrace Neighborhood Oxbow Neighborhood Area Flooding Bluff Street Area Flooding Lifschutz Headwaters Park 35 South Drainage Ditch Cole Springs Roadway Flooding <p>(Lockwood, Andrews & Newnam, Inc., 2014)</p>
City of Buda Drainage Master Plan: Phase 2	Plan	<p>Use of additional 20 problem areas for flooding, as shown in Figure BA.6. (Freese and Nichols, Inc., 2015)</p>
The 2012 Buda Parks, Recreation, Trails and Open Space Master Plan	Plan	<p>Consideration of public survey input from plan development for consideration for actions.</p> <p>"One complaint...was that drainage corridors and detention basins in Buda take away from the City's natural beauty and are often unattractive...improve the drainage corridors and detention basins with park-like features even if it increases maintenance costs." (Halff Associates, 2012)</p>
City of Buda Space Needs Assessment and Facilities Master Plan	Plan	<p>This document that covered a study of the staffing, space needs and facilities needed for the City of Buda was used to identify City facility locations and review for potential integration opportunities. The plan identifies the City Hall Annex building as having reached its effective lifespan and should be eventually sold. This indicates the structure is likely susceptible to damage in the event of a natural hazard. In addition the plan indicates that the community will likely need triple of the public building space (from 28,900 SF footage to a total of 150,000) within a period of 20 years based on anticipated population growth. (Wigninton Hooker Jeffry Architects, 2014)</p>





Table BA.3, Review/Incorporation of Sources, (cont.)

Name of Document	Type	How Incorporated
2015 Downtown Master Plan for Buda, TX	Plan	<p>Considered future development suggestion for the following:</p> <ul style="list-style-type: none"> Northeast along Main Street - enhance floodplain areas along Main Street so that they become assets. Encourage the development of ponds with permanent water as signature gateway elements leading into the downtown area. (Halff Associates, 2015)
City of Buda 5-Year Capital Improvement Plan	Plan	<p>Consideration of inclusion of projects from CIP:</p> <ul style="list-style-type: none"> Park 35 South - Fire Water (209) Hillside Terrace Wastewater Improvements (309) (TWDB) Wastewater Impact Fee (310) Drainage projects 601-630 Culvert and Park Improvements (805,808,809,810,811,812) Oxbow Water Service Sportsplex Effluent Irrigation (to reduce demand on potable water) Apple Blossom Street Home Flooding Bradfield Village Culverts Under Main Street Brushy Creek Culvert 2 (warning and flood stage signs) Brushy Creek Culvert 3 Dacy Lane Low Water Crossing FM 967 Onion Creek Bridge Automatic High Water Warning Gates Garison Road Area Flooding - Residential flood-proofing for homes Garlic Creek Tributary Culvert Replacements Old San Antonio Ditch Old Town South Culvert 1 Onion Creek Low Water Crossing signs, flood depth signs and automatic road closure gates Bradfield Park Improvement could be enhanced to include shelter for citizens from lightning Bluff Street Area Flooding Fire Station Area Flooding West Goforth Street Area Flooding Houston Street Area Flooding Oxbow Drainage Improvements Cole Springs Road Flood Warning Signs <p>(City of Buda Engineering, 2015)</p>
Buda Economic Development Strategic Plan	Plan	<p>Incorporate plan Action to:</p> <ul style="list-style-type: none"> Action 2.3 - Ensure water availability in all development sites. Action 2.4 - Foster regional detention at FM 967/FM 1626. Action 7.13 - Support Implementation of Parks and Trails Plan. <p>(Pegasus, 2013)</p>
City of Buda Flood Emergency Warning System	Project	<p>Plan for potential Flood Emergency Warning System, with overlapping CIP projects that can be included in mitigation action plan for the multiple flood warning system sites. (City of Buda Office of Emergency Management)</p>
City of Buda Drought Contingency Plan	Plan	<p>Considered drought stage alignment with other mitigation activities considered in the HMP, such as including migration measures within the drought stage triggers.</p>



Section 2: Risk Assessment

City of Buda Jurisdictional Hazards

This section contains Buda's hazard profiles for each natural hazard included in the Hays County HMP Update. Profiles include:

- Location - the area where the hazard is known to occur
- Previous Occurrences - a history of reported events for the hazard
- Significant Previous Occurrences (when applicable) - notable hazard events within the community
- Extent - the strength or magnitude of the hazard
- Probability - the likelihood of the hazard event occurring in the future
- Impact - the consequence or effect (or possible effect) of hazard events
- Vulnerability Summary - identification of structures, systems, populations or assets susceptible to loss or damage and how they are/could be impacted

Hazard descriptions and extent scales for hazard magnitudes are found in Chapter 2, the risk assessment portion of the main plan document.

When available, data specific to Buda was used for hazard analysis. When no instances were reported specifically for the jurisdiction for regional hazards, County-wide data was applied.

State and national datasets were used to determine occurrence, extent, and the respective probabilities, rather than verbal testimonies, in an effort to retain data consistency. For some hazards, the National Oceanic and Atmospheric Administration (NOAA) Storm Events Database was used as the most comprehensive data available for hazards. The Storm Events Database does not always reflect the most recent totals for fatality, injury and damage amounts shown for previous occurrences. The Previous Occurrences paragraphs identify instances in which this may occur. Verbal testimony, when available, was integrated into impact or vulnerability summaries to account for updates in this data.

2.1 Hazard Profiles

Hazards profiled within the risk assessment include:

- Drought - Within Chapter 2, the risk assessment portion of the main plan document.
- Extreme Heat - Within Chapter 2, the risk assessment portion of the main plan document.
- Severe Winter Storms - Within Chapter 2, the risk assessment portion of the main plan document.
- Lightning - Within Chapter 2, the risk assessment portion of the main plan document.
- Hailstorms
- Windstorms
- Tornadoes
- Expansive Soils
- Floods
- Hurricanes/Tropical Storms
- Earthquakes
- Dam/Levee Failure
- Wildfires



Hailstorms

Hailstorms: Location

The entire extent of the City of Buda is exposed to some degree of hail hazard. Since hail can occur at any location, hail events could be experienced anywhere within the planning area.

Hailstorms: Previous Occurrences

According to the NOAA Storm Events Database, there were 6 documented hail events listed for the City of Buda and 57 documented events listed for Hays County and its unincorporated jurisdictions from year 1967. While the NOAA Storm Events Database lists events since the year 1967 for the County, events were not documented per jurisdiction until 1993.

Hailstorms: Extent and Probability

The Tornado and Storm Research Organization (TORRO) created a hail extent index to measure hail called the Hailstorm Intensity Scale. According to the reported previous hail occurrences for the planning area, the maximum hail extent experienced was up to 1.75 in., or 44.45 mm. in diameter (corresponding to a TORRO Hailstorm Intensity Scale classification of “Destructive”). Refer to Chapter 2, the risk assessment portion of the main plan document, for hail extent scale descriptions.

Based on 6 reported events in 23 years, the City of Buda can expect a hail event approximately once every 4 years (on average) in the future with hail up to 1.75 in., or 44.45 mm. in diameter, corresponding to a TORRO Hailstorm Intensity Scale classification of “Destructive.”

Hailstorms: Impact

Based on the maximum hail extent experienced (44.45 mm), the TORRO Hailstorm Intensity Scale indicates that impact can be expected to include any of the following:

- Varying degrees of damage to vegetation and crops
- Damage to plastic structures
- Varying degrees of damage to glass
- Paint and wood scored
- Vehicle bodywork damage
- Varying degrees of roof damage
- Varying degrees of risk of injuries
- Varying degrees of aircraft damage
- Brick walls pitted

Hailstorms: Vulnerability Summary

Although the City has not experienced significant past damage to public property due to hail, the roof types and windows on all of the City structures could be susceptible to hail damage. Examples of critical facilities that are vulnerable to hail are Buda City Hall, Buda City Library, Buda Police Department, Buda’s Utilities Department, Buda Visitor’s Center and the Buda Public Works Department.

There is not a dedicated sheltering structure for protecting critical City equipment or vehicles. This could be a possible future incorporation into the Facilities Master Plan.





Windstorms

Windstorms: Location

The entire extent of the City of Buda is exposed to some degree of wind hazard. Since wind can occur at any location, wind events could be experienced anywhere within the planning area.

Windstorms: Previous Occurrences

According to the NOAA Storm Events Database, there were 4 documented wind events listed for the City of Buda and 38 documented events listed for Hays County and its unincorporated jurisdictions since the year 1974. While the NOAA Storm Events Database lists events since 1974 for the County, events were not documented per jurisdiction until 1994.

Windstorms: Extent and Probability

Wind is measured by the Beaufort Wind Scale that relates wind speed to observed conditions on land and sea. The reported wind events for the City did not indicate magnitude, however, as wind events can happen anywhere in the HMP update area, the extent of a wind event for the City of Buda can be assumed to be similar to the surrounding County areas. According to the reported previous windstorm occurrences for the surrounding County, the maximum wind extent experienced was 70 knots (corresponding to Beaufort Wind Scale Classification: Hurricane). Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of wind extent scales.

Based on 4 reported events in 22 years, the City of Buda's probability for a wind event is approximately every 5 to 6 years with winds up to 70 knots or 80.55 miles per hour, on average (Beaufort Wind Classification: Hurricane).

Windstorms: Impact

City level data available from the Texas Department of Transportation's Crash Records Information System shows that between the years of 2010 and 2017, Buda experienced 2 crashes in 2011 related to severe crosswind weather conditions. There were no reported injuries for these crash events.

Table BA.4, Windstorms, Vehicle Accidents, City of Buda

City	Fatality	Incapacitating Injury	Non-Incapacitating Injury	Possible Injury	Crash Year	Street Name	Surface Condition	Weather Condition
Buda	0	0	0	0	2011	IH0035	Wet	Severe Crosswinds
Buda	0	0	0	0	2011	IH0035	Wet	Severe Crosswinds

Query for Accidents in Buda from 2010-2017 from non-Clear Weather Conditions (Texas Department of Transportation, 2017)

Structures can be damaged by flying debris and impact from winds, damaging rooftops and causing other structural damage. Manufactured homes are especially vulnerable to damage that high winds can cause, to include destruction in the most extreme event conditions. According to the Office of Emergency Management for Buda, the City has about 50 units of factory-built housing to include manufactured homes and mobile homes.



Hays County Hazard Mitigation Plan, City of Buda Annex

Critical infrastructure, such as utility poles and street signals, could also be disrupted, impacting all residents in the affected area. Debris on the roadway can also cause obstruction for emergency responders' ability to provide services.

In addition, the Buda City Hall Annex is a building that the Buda Facilities Study (Wigninton Hooker Jeffry Architects, 2014) found to have reached its effective lifespan. This is potentially a risk to the integrity of the structure and its ability to withstand the conditions of a tornado.

Windstorms: Vulnerability Summary

Buda has previously experienced debris accumulation on all 81 miles of roadway within the 8.8 miles of the City limits during past windstorm events. Such incidents could cause impact on the ability of public safety officials to respond to emergency calls.

If a wind event were to damage any of the 50 manufactured or mobile homes, there are not any emergency shelters designated for residents.

Additionally, there are many sites of critical facilities and infrastructure that are located within the City and are not retrofitted to mitigate damages from extreme winds events. These facilities include: Buda Fire Department Station 1, Buda City Hall, Buda Police Department, and Southwest EMS. Damages sustained by a severe wind event to these facilities could hinder the ability to provide crucial services needed by the community.





Tornadoes

Tornadoes: Location

The entire extent of the City of Buda is exposed to some degree of tornado hazard. Since tornadoes can occur at any location, tornado events can be experienced anywhere within the planning area.

Tornadoes: Previous Occurrences

While the City of Buda has not had any previous occurrences reported through the NOAA Storm Events Database, if an event were to occur, the event would be similar in size and magnitude to events within the surrounding County areas. Table BA.5 lists the 16 tornado events reported for Hays County and its unincorporated jurisdictions since the year 1953.

Fatality, injury and damage amounts are shown in Table BA.5, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table BA.5, Tornado Events, Hays County

Location	Date	Type	Extent	Fatalities	Injuries	Property Damage	Crop Damage
Hays County	4/28/1953	Tornado	F3	1	5	250,000.00	0.00
Hays County	4/30/1954	Tornado	F1	0	0	250,000.00	0.00
Hays County	5/2/1958	Tornado	F1	0	0	30.00	0.00
Hays County	11/12/1961	Tornado	F2	0	0	2,500.00	0.00
Hays County	9/20/1967	Tornado	NA	0	0	250.00	0.00
Hays County	9/20/1967	Tornado	NA	0	0	30.00	0.00
Hays County	5/10/1975	Tornado	F1	0	0	25,000.00	0.00
Hays County	3/30/1976	Tornado	F2	0	0	25,000.00	0.00
Hays County	3/30/1976	Tornado	F2	0	1	250,000.00	0.00
Hays County	8/10/1980	Tornado	F2	0	0	25,000,000.00	0.00
Hays County	4/22/1985	Tornado	F2	0	0	250,000.00	0.00
Hays County	8/22/1991	Tornado	F1	0	0	2,500.00	0.00
Countywide	5/13/1994	Tornado	F0	0	0	500.00	500.00
Henly	11/15/2001	Tornado	F0	0	1	50,000.00	0.00
Driftwood	10/8/2002	Tornado	F0	0	0	70,000.00	0.00
Mt. Gainor	5/23/2015	Tornado	EF0	0	0	0.00	0.00
Total				1	7	\$26,175,810.00	\$500.00

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)

Tornadoes: Extent and Probability

Tornadoes are measured by severity on the Fujita and Enhanced Fujita Scale, with a range from 0-6. According to the reported previous tornado occurrences in the planning area, the maximum tornado extent experienced was a category F3. Refer to Chapter 2, the risk assessment portion of the main plan document for a description of tornado extent scales, Fujita (F) Scale and Operational Enhanced Fujita (EF) Scale.





Based on 16 reported events in 63 years, a tornado event occurs approximately every 4 years on average in Hays County. City of Buda's future probability is assumed to be similar to the surrounding County areas. Buda's probability of a tornado event is approximately once every 4 years (on average) in the future, with up to an F3 magnitude.

Tornadoes: Impact

There is no specific event data available for the City of Buda, from which impacts would be calculated. However, it can be assumed that impacts would be similar to those that the surrounding County area experiences.

Based on Hays County having experienced tornadoes between F0 and F3 levels in the past, if similar events were to happen in the future in the City, the type of impacts that the jurisdiction can expect associated with those magnitudes would include, from least to greatest:

- Light Damage - Broken branches; shallow rooted trees pushed over; some chimney damage.
- Moderate Damage - Surface damage to roofs; mobile homes pushed off foundation; moving vehicles pushed off the road.
- Significant Damage - Frame houses have roof torn off; mobile homes completely destroyed; train boxcars overturned; large trees snapped or uprooted; smaller debris turned into missiles.
- Severe Damage - Roofs completely torn off well-constructed buildings, along with some walls; majority of trees uprooted; trains overturned; vehicles lifted off the ground.

(Tornado Facts, 2016)

Critical infrastructure, such as utility poles and street signals, could also be disrupted, impacting all residents in the affected area. Debris on the roadway can also cause obstruction for emergency responders' ability to provide services.

Tornadoes: Vulnerability Summary

Residents of multi-story apartment complexes are at greater risk if they are not located on the lowest floor of the structure. The Buda Economic Development Corporation (Buda Economic Development Corporation, 2017) maps for subdivision show approximately 1,329 multi-family development units within the City Limits and ETJ. Approximately 1,007 units are in the City limits. Public education for encouraging apartment residents to seek shelter in the lowest possible level during tornado events would be beneficial.

If a tornado event were to damage any of the 50 manufactured or mobile homes, there are not currently any emergency shelters designated for residents.

Buda City Hall Annex is a building was included in the Buda Facilities Study (Wigninton Hooker Jeffrey Architects, 2014) as a structure found to have reached its effective lifespan. This is potentially a risk to the integrity of the structure and its ability to withstand the conditions of a tornado.

Additionally, there are many sites of critical facilities and infrastructure that are located within the City and are not retrofitted to mitigate damages from the extreme winds that accompany tornado events. These facilities include: Buda Fire Department Station 1, Buda City Hall, Buda Police Department, and Southwest EMS. Damages sustained by a tornado event to these facilities could hinder the ability to provide crucial services needed by the community.





Expansive Soils

Expansive Soils: Location

According to the USGS Expansive Soils Regions, Figure 2.3 within Chapter 2 (the risk assessment portion of the main plan document) shows the location of expansive soil areas for the City. The eastern half (highest risk) of the jurisdiction is classified as having over 50 percent of the area underlain by soils with abundant clays of high swelling potential, while the western half of the jurisdiction is classified as having less than 50 percent of the area underlain by soils with clays of high swelling potential.

Expansive Soils: Previous Occurrences

There was no documentation of past site-specific events of structural damage due to expansive soils from local, State, or national datasets found.

Expansive soils cannot be documented as a time-specific event, except when they lead to structural and infrastructure damage. There are no specific damage reports or historical records of events in the City, however future events can occur.

Expansive Soils: Extent and Probability

Considering the amount of swelling potential within the jurisdiction, and the lack of reported events, the probability of a future event is low (0 - 1 occurrences in the next 10 years affecting less than 5 structures).

Expansive Soils: Impact

Foundation issues for slab buildings and road base pads for mobile homes are the most visible impacts to infrastructure and structures. Undocumented reports of impact include small cracks to foundation and terrain. Increased severity in weather and natural conditions lead to increased soil swelling, resulting in deeper and longer cracks, and possible structural shifting.

Expansive Soils: Vulnerability Summary

Areas within Buda that are experiencing higher amounts of development on previously undeveloped land may find a higher impact as this will offer increased opportunity for structural foundation damage in areas with high clay content. The expansion of the jurisdictional boundaries continuing to grow and the development of more land between Austin, Texas and Buda can lead to exposure of previously unidentified areas of expansive soil. The lack of current problems faced in the community leads to a lessened concern for the issue. Should parts of the community with higher concentrations of clay in the soil begin to experience development, there may be a heightened amount of impact to residential structures and roads within Buda.



Floods

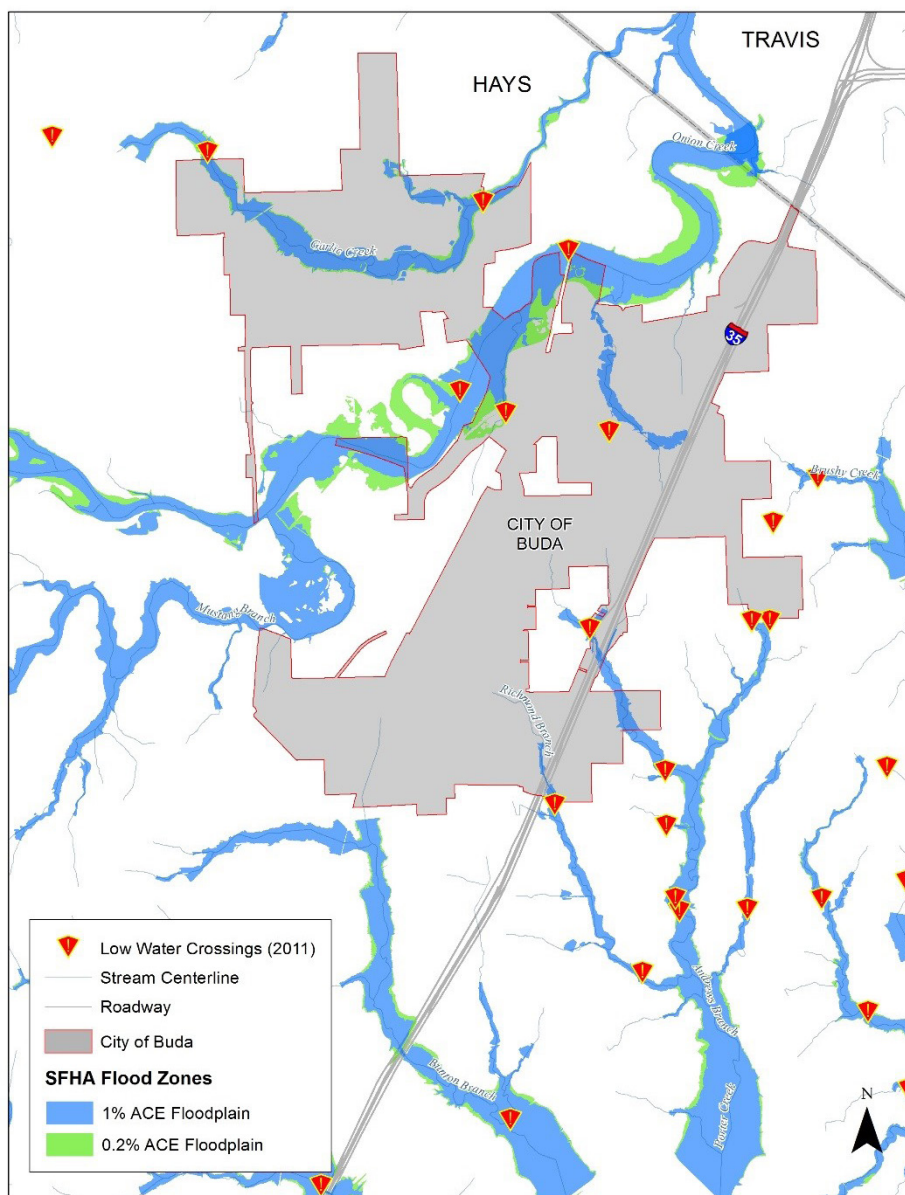


Floods: Location

Onion Creek and Garlic Creek are 2 major bodies of water that run through Buda. The floodplain along these creeks limits development along its banks; however the creeks and greenways along them present an opportunity for preservation and possible recreation.

The location of low water crossings, as well as the 1% (100 year) and 0.2% (500 year) Annual Chance Event (ACE) floodplains for the City of Buda, are shown in Figure BA.4. This figure represents the locations within the planning area that are most affected by riverine flooding. This figure is based upon newly developed hydrologic and hydraulic analysis. The new analysis is considered the best information available to date. Table BA.6 provides the total acreage in the jurisdiction that is located in the 1% and 0.2% floodplains.

Figure BA.4, Special Flood Hazard Areas and Low Water Crossings, City of Buda



(Texas Natural Resources Information System, 2011)





Table BA.6, City of Buda Floodplain Acreage

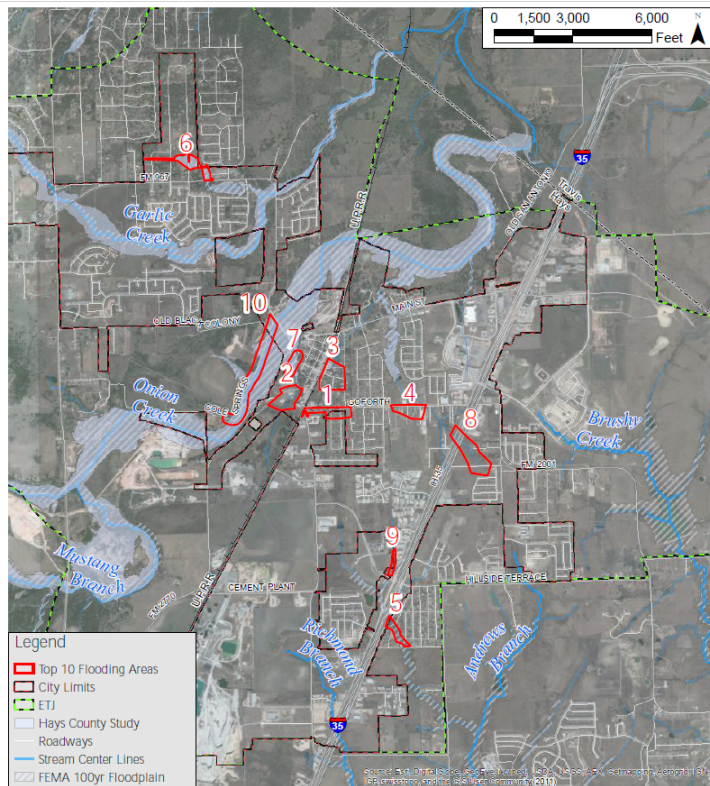
Jurisdiction	100yr (1%) Floodplain Acres (Includes Floodway)	500yr (0.2%) Floodplain Acres (Includes 100yr)
City of Buda	476	571

Drainage Plan Identified Flooding Problem Areas

The City of Buda *Drainage Master Plan: Phase 1* (prepared in 2014) identified the top 10 Flooding Problem Areas, shown in Figure BA.5. The Phase 2 plan was prepared in 2015 that identified 20 additional problem areas.

By utilizing these already identified problem areas, planners for Buda can ensure that actions align with the solutions that are already incorporated into the Phase 1 and Phase 2 plans. (Phase 1 Plan: Lockwood, Andrews & Newman, Inc., 2014; Phase 2 Plan: Freese and Nichols, Inc., 2015).

Figure BA.5, Top 10 Flooding Problem Areas, City of Buda



(Lockwood, Andrews & Newnam, Inc, 2014)

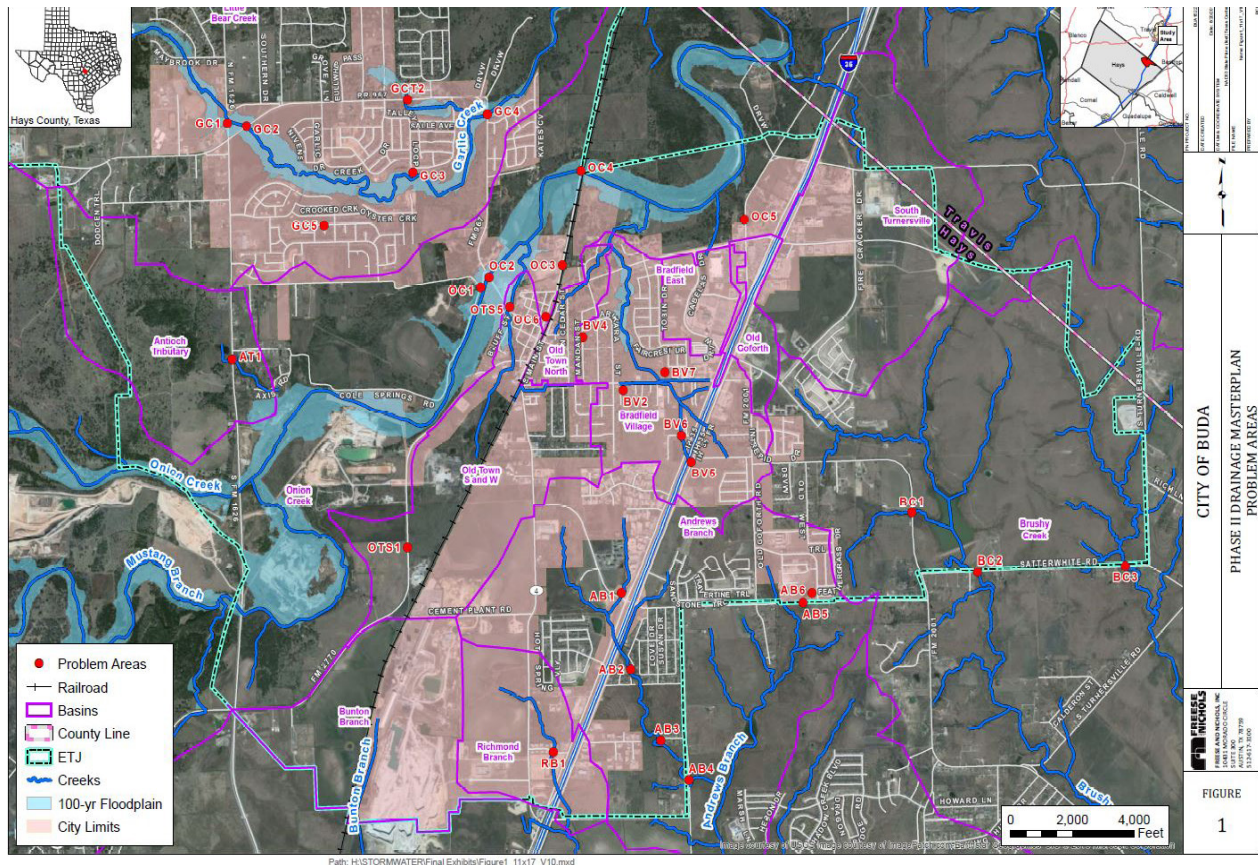
EXHIBIT No. 3
TOP 10 FLOODING PROBLEM AREAS
Date: 03/2014

#	ID	Site Name
1	OTS2	West Goforth Street Area Flooding
2	OTS3	Fire Station Area Flooding
3	OTN1	Houston Street Area Flooding
4	BV2	West Lifschutz Area Flooding
5	AB2	Hillside Terrace Neighborhood
6	GCT2	Oxbow Neighborhood Area Flooding
7	OTS4	Bluff Street Area Flooding
8	BV1	Lifschutz Headwaters
9	AB1	Park 35 South Drainage Ditch
10	OC1	Cole Springs Roadway Flooding



Hays County Hazard Mitigation Plan, City of Buda Annex

Figure BA.6, Phase II Drainage Master Plan Problem Areas, City of Buda



(Freese and Nichols, Inc., 2015)





Floods: Previous Occurrences

Hays County received 3 Federal disaster declarations for flooding since 2013. These events occurred in October of 2013, May of 2015 and October of 2015. These events are detailed in this annex under the *Floods: Significant Past Events* paragraph of this annex.

According to the NOAA Storm Events Database, there were 4 documented flood events listed specifically for the City of Buda. The three aforementioned Federally - declared disaster events are recorded in NOAA's Storm Event Database under other cities (Wimberley and Driftwood). As Buda experienced significant impact during the events, those entries have been included in Table BA.7.

Fatality, injury and damage amounts are shown in Table BA.7, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period. Table BA.8 illustrates information provided by The City of Buda indicating residential, commercial, and public damages collected in a Master Flood Damage Assessment conducted after the October 2015 flood event.

Table BA.7, Flood Events, City of Buda

Location	Date	Type	Magnitude (mm)	Fatalities	Injuries	Property Damage*	Crop Damage*
Buda	5/29/2005	Flash Flood	0	0	0	0.00	0.00
Wimberley	10/31/2013	Flash Flood	0	0	0	1.000M	0.00
Wimberley	5/24/2015	Flash Flood	0	10	0	100.000M	0.00
Driftwood	10/30/2015	Flash Flood	0	0	0	10.000M	0.00
Buda	5/26/2017	Flash Flood	0	0	0	0.00	0.00
Buda	5/27/2016	Flash Flood	0	0	0	0.00	0.00
Buda	8/20/2016	Flash Flood	0	0	0	0.00	0.00
Total				10	0	\$111.000M	\$0.00

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)

Table BA.8, October 2013 Flood Damage Estimates, City of Buda

Asset	Recorded Damage
Residential	\$150,000.00
Commercial	\$350,000.00
Public	\$248,950.00
Total	\$748,950.00

(City of Buda Department of Emergency Management Situation Report, 2013)

Table BA.9, October 2015 Flood Damage Estimates, City of Buda

Asset	Recorded Damage
Residential	\$2,466,500
Commercial	\$1,273,500
Public	\$686,351
Total	\$4,426,351

(City of Buda Disaster Preliminary Damage Assessment, 2015)





Floods: Significant Past Events

According to the NOAA Storm Events Database, in October of 2013 (Disaster 4159-DR), storms produced heavy rainfall leading to major flooding within the Onion Creek watershed. Thunderstorms produced heavy precipitation that led to flash flooding in Buda. Rainfall totals near Buda approached 10 inches. Four businesses sustained major damage, including the Buda Fire Department, Jack C Hays Trail Station, and Buda Elementary School.

According to the NOAA Storm Events Database, in May of 2015 (Disaster 4223-DR), a flash flood occurred throughout Hays County, including the City of Buda. According to the Office of Emergency Services, FEMA awarded over \$3.5 Million in public assistance to Hays County in response to this disaster.

According to NOAA Storm Events Database, in October of 2015 (Disaster 4245-DR), a warm front combined with an upper level trough and deep moisture produced heavy rainfall and severe thunderstorms across much of South Central Texas. On October 30th and 31st, excessive rainfall resulted in widespread flash flooding along the IH-35 corridor. Rainfall rates on the order of 5 to 7 inches per hour fell, with some isolated daily rainfall totals exceeding 15 inches. Record stream flow occurred in Buda resulting in more than \$260,000 in damage claims submitted to FEMA for City of Buda facilities alone. An estimated 2,000 homes were flooded in or near the IH-35 corridor, and many of them were destroyed or sustained major damage.

According to the NOAA Storm Events Database, in May of 2016, an upper level trough moved out of the southern Rockies and provided sufficient lift to form thunderstorms along a dryline in West Texas. These storms moved into South Central Texas and were further enhanced by an outflow boundary that moved out of North Texas. Some of these storms produced large hail, damaging wind gusts, and heavy rain that led to flash flooding. These storms produced heavy rain that caused flash flooding resulting in a water rescue in Buda, flooding at a Buda fire station on RM 2770 and within 3 homes on West Goforth Road, (Wester, 2016).

Floods: Extent

Flood extent is described through a combination of ground elevation, river gauge heights, 100-year Water Surface Elevations (WSE's) and HAZUS depth grids. Areas along Onion Creek are exposed to some of the greatest flood extents. An example of flooding within the jurisdiction along Onion Creek is a neighborhood near Bluff Street and FM 2770. This neighborhood has an approximate overbank ground elevation of 690 feet above mean sea level with an intersecting 100-year WSE of 692 feet. For a 100-year event, water depth of approximately 2 feet can be expected within this area. A further analysis of the Onion Creek extent is described below.

With Onion Creek having an approximate normal in-channel elevation of 660 feet above mean sea level (per Light Detection and Ranging [LiDAR] and USGS gauge data), and an intersecting 100-year WSE of approximately of 692 feet, flood depths would be approximately 32 feet.

Floods: Probability

Probability has been calculated on the basis of NOAA reported events, as a standard, consistent calculation method for all hazards profiled with the Hays County HMP. Based on 7 reported events in 12 years, the City of Buda can expect a flood event approximately once every 1 to 2 years (on average) in the future, up to 32 feet in depth.





Floods: Impact

The following describes the inventory counts and building replacement values for the jurisdictional area.

Buda Building Counts			
Residential	Commercial	Other	Total
2,529	93	72	2,694

Buda Building Replacement Value		
Building (\$)	Content (\$)	Total (\$)
916,526,051	527,610,582	1,444,136,633

A Probabilistic 100-year Return Period HAZUS-MH 3.2 analysis was run on City of Buda. HAZUS results are calculated to census blocks. This analysis utilized the best available LiDAR (COA 2012 and CAPCOG 2008) and depth grids. These blocks were then intersected with the City of Buda to run a weighted area analysis for jurisdictional results. The following paragraphs describe results from the 100-year Return (1% Annual Chance Event) weighted area analysis.



Debris on remnants on Main Street in Buda, Texas.





HAZUS-MH Results

General Building Stock Damage

HAZUS estimates that 11 buildings will be at least moderately damaged in the City of Buda. "At least moderately damaged" is defined by HAZUS as greater than 10% damage to a building. For this scenario, only residential buildings were at least moderately damaged.

Residential Buildings	Commercial Buildings	Other Buildings	Total Buildings
11	0	0	11

Building-Related Losses

Exposed Value is the total building and content values for structures within the community. The exposed value for the community is \$1,444,136,633. The total building-related losses were \$3,784,095. This represents 0.3% of the total replacement value of the community. Loss values are divided into building and content loss dollars.

Building Loss (\$)	Content Loss (\$)	Total Loss (\$)
2,325,215	1,458,880	3,784,095

Essential Facility Damage

HAZUS does not estimate any critical facilities or infrastructure interruption to be for more than 1 day. The model estimates that 100% of community hospital beds would be available for use by patients already in the hospital and for those injured by an event.

Debris Generation

HAZUS estimates the amount of debris that will be generated in this scenario. The model estimates that a total of 406 tons of debris will be generated. If the building debris tonnage is converted to an estimated number of truckloads, it will require 17 truckloads (with 1 to 25 tons per truck) to remove the building debris generated in this scenario.

Road damage from past flooding event, Buda, Texas.





Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS also estimates the number of people displaced that will require accommodations in temporary public shelters. The model estimates 30 people will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 19 people are estimated to seek temporary shelter in public shelters.

Floods: Vulnerability Summary

The location of Onion Creek Village apartments (32-1 story units that are part of the Equal Housing Opportunity that is characterized by its Handicap Accessible units) in an area between the Onion Creek watershed and the Tributary crossing Jack C. Hays Trail, is a concern. This warrants consideration for mitigation activities to reduce risk to residents that may not have the ability or vehicles necessary for a fast evacuation in the event of flash flooding.

Buda Fire Department Station #1 is located near the floodplain, at 209 Jack C. Hays Trail. Inundation of this structure interrupts accessibility of emergency services for residents serviced by this station.

There are multiple schools in or near the floodplain along Onion Creek, to include Buda Elementary-Lower Campus. Children who attend these schools are at risk during flooding event and could inundate both buildings and roads leading to the campuses.

There are also multiple low water crossings on Jack C. Hays Trail near school zones. Low water crossings near the high school put inexperienced drivers at risk, as they may attempt to crossing while flood waters are high.

National Flood Insurance Program Repetitive Loss (RL)

There are currently 3 properties in Buda classified as Repetitive Loss structures. There are 2 are on W. Goforth Road. The third is located on FM 967. The total losses for the last 10 years total \$351,463.17 on 6 paid claims for the 3 structures. None are mitigated and only 1 is presently shown as insured.

Structure Type	Number of Structures	Number of Claims	Amount of Claims
Residential	2	4	\$149,765.67
Non-Residential	1	2	\$201,697.50



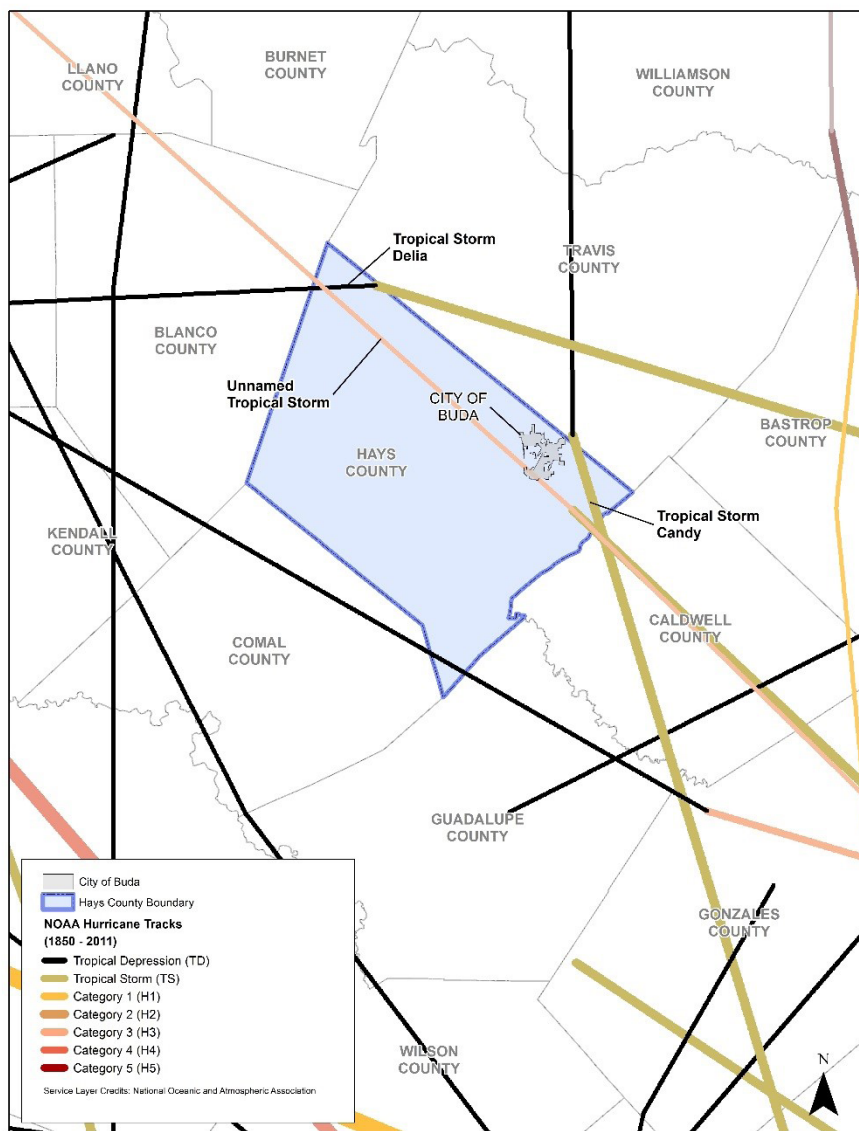


Hurricanes/Tropical Storms

Hurricanes/Tropical Storms: Location

Due to the regional nature of a hurricane or tropical storm event, the entire extent of the City of Buda is equally exposed to a hurricane or tropical storm. Figure BA.7 illustrates the location of the planning area with historical hurricane and tropical storm paths documented by NOAA's Hurricane Tracker from 1850 to 2011.

Figure BA.7, Historical Hurricane/Tropical Storm Paths, City of Buda



(National Oceanic and Atmospheric Administration, 2016)

Hurricanes/Tropical Storms: Previous Occurrences

Previous events are described below based on the NOAA Storm Events Database for Tropical Storm Hermine and NOAA Hurricane Tracker for all other events. By the time most hurricanes reach the County, they are tropical storms, depressions or thunderstorms. Because hurricane and tropical storm events occur on a regional scale, all events listed for Hays County have been included, as they would impact the





City of Buda.

July 13 to July 22, 1909 – An unnamed storm made landfall near Freeport, as a Category 3 Hurricane. This storm impacted Hays County and participating communities as a tropical depression with wind speeds up to 30 knots. No significant damages, injuries, or fatalities were reported for the City of Buda.

June 22 to June 26, 1968 – Tropical Storm Candy made landfall near Port Aransas. This storm impacted Hays County and participating communities as a tropical storm with wind speeds slowing to 30 knots as a tropical depression just after leaving the

County. No significant damages, injuries, or fatalities were reported for the City.

September 1 to September 7, 1973 – Tropical Storm Delia made landfall near the border of Brazoria and Matagorda Counties. This storm impacted Hays County and participating communities as a tropical storm with wind speeds slowing to 30 knots as a tropical depression just after leaving the County. No significant damages, injuries, or fatalities were reported for the jurisdiction.

September 6 to September 8, 2010 – According to the NOAA Storm Events Database, Tropical Storm Hermine made landfall near the Texas/Mexico border on the night of September 6. South Central Texas was hit very hard with widespread rains of 8 to 12 inches across much of the IH-35 corridor from Austin down to San Antonio.

Hurricanes/Tropical Storms: Extent and Probability

The Saffir-Simpson Scale measures pressure, wind speed, and storm surge in 5 categories. According to the reported previous hurricane occurrences in the jurisdiction, the maximum hurricane extent experienced was categorized as a tropical storm. Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of storm extents.

Based on 4 reported events in 107 years, a hurricane or tropical storm event occurs approximately every 27 years on average in Hays County. Since hurricane and tropical storm events can happen anywhere throughout the HMP update area, the City of Buda's future probability is assumed to be similar to the surrounding County areas. In the future, the City can expect an event approximately once every 27 years on average, of up to a magnitude of a tropical storm at a 100-year Max Wind Speed of 74 mph based on historical extents and HAZUS analysis.

Hurricanes/Tropical Storms: Impact

A Probabilistic 100-year Return Period HAZUS-MH 3.2 analysis was run for City of Buda. The following paragraphs describe the results of this analysis.

HAZUS-MH Results

General Building Stock Damage

The total property damage losses were \$239,388. The majority of damage can be expected to impact residential areas (98%). The remaining damages (2%) are for commercial, industrial, agricultural and religious buildings. While some building damage is experienced, it is estimated that no buildings will be completely destroyed or experience severe damage. Exposed Value is the total building and content values for structures within the community. Loss values are divided separately for building and content loss in dollars.

Exposed Value (\$) (Building + Content)	Building Loss (\$)	Content Loss (\$)	Total Loss (\$)
1,444,136,633	2,325,215	1,458,880	3,784,095





Essential Facility Damage

HAZUS does not estimate any critical facilities or infrastructure to be interrupted for more than 1 day. The model estimates that 100% of available hospital beds would be available for use by patients already in the hospital and for those injured by the hurricane.

Debris Generation

HAZUS estimates the amount of debris that will be generated by the hurricane at a total of 14 tons. Of the total amount, Brick/Wood comprises 100% of the total. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 (with 1 to 25 tons per truck) to remove the building debris generated by the hurricane.

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of people displaced that will require accommodations in temporary public shelters. The model estimates no households to be displaced due to the hurricane. While there is an estimation of over \$239,000 in property damages expected, it is aforementioned that “no buildings would be completely destroyed or experience severe damage.” Residents would likely remain in their homes as damages were repaired, therefore no temporary shelter is needed.

Hurricanes/Tropical Storms: Vulnerability Summary

Similar to the impacts of windstorms, hailstorms, and lightning, Buda can expect to be impacted with debris and possible interruptions of critical infrastructure if the event is a stronger magnitude than those previously experienced by the City. In addition, the community’s proximity to IH-35 could lead to traffic delays caused by major evacuation efforts, if the highway is used as an evacuation route for coastal residents.

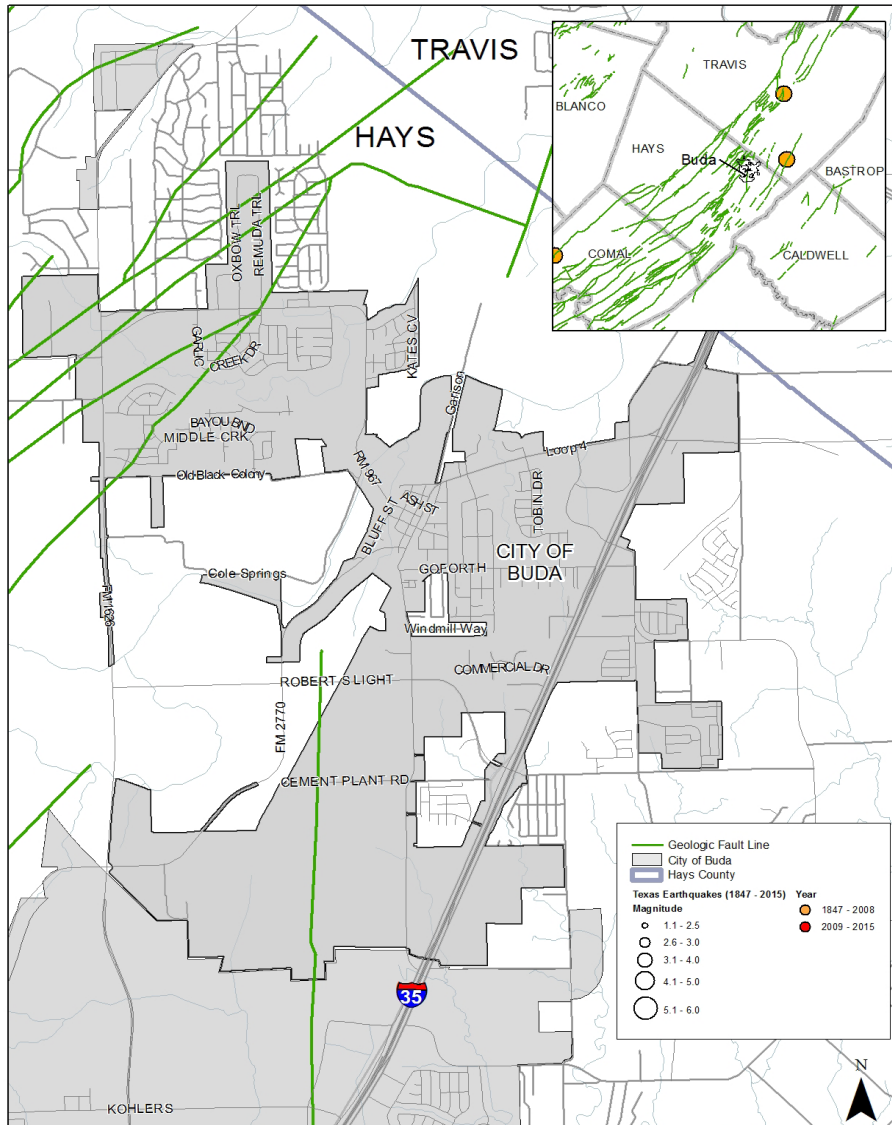


Earthquakes

Earthquakes: Location

Locations within proximity to fault lines are typically the areas most at risk for earthquakes. Figure BA.8 shows USGS documented fault lines and the locations of earthquakes from 1847 to 2015 in relation to the City of Buda.

Figure BA.8, Texas Earthquakes, 1847 – 2015 , City of Buda



(USGS Earthquake Hazard Program, 2015)



Earthquakes: Previous Occurrences

According to USGS 1847-2015 data, there have been no documented earthquake events for the City of Buda, as illustrated in Figure BA.8.



Earthquakes: Extent and Probability

Earthquakes are measured by Peak Ground Acceleration (PGA). The HAZUS Max PGA for the planning area is 1.58% (see City of Buda Earthquakes: Impact Section for a description of the HAZUS Analysis). This corresponds to the Modified Mercalli Scale Category IV, with light perceived shaking and no potential structure damage. HAZUS measures PGA on a census tract level. Cities within more than 1 census tract were assigned the highest PGA level to reflect the maximum possible extent. Refer to Chapter 2 for extent scale descriptions (the risk assessment portion of the main

plan document).

As there have been no recorded previous occurrences of earthquakes for the City of Buda and the PGA is less than 2% for the area, the probability of an earthquake in the City in the future is low (0 - 1 occurrences in the next 10 years, at up to a 500yr PGA of 1.58%).

Earthquakes: Impact

The FEMA How-To Guidance, Understanding Your Risks (FEMA 386-2, page 1-7), suggests the earthquake hazard should be profiled if the PGA is greater than 3%g, where PGA measures the acceleration of gravity (g). The City's PGA is less than 3%g (0.03) and there have been no recorded earthquakes in or near the jurisdiction. Therefore, only a minimum level-1 HAZUS analysis was profiled using the 500-year probability event scenario. The HAZUS analysis produced a PGA of 1.58%. The HAZUS scenario would produce \$0 in building damages (Residential, Commercial, Agriculture, Religious and Government) from an event. Critical facilities and Infrastructure would not experience any loss of service. There would be no critical facilities or infrastructure would experienced moderate to complete damage. No debris would be generated from this event and no people or households would require temporary housing. There would be no moderate, extensive or completely damaged buildings by this event. HAZUS estimates no residents are expected to be displaced from their homes or will require accommodations in temporary public shelters due to the simulated earthquake. Additionally, there would be no causalities or fatalities from this event.

Earthquakes: Vulnerability Summary

While the probability of an earthquake in Buda is low, with no significant prior events on file, there are fault lines within the community that could cause impact if there were to be an increase in seismic activity in the area. There are 6 fault lines located within the jurisdiction according to USGS data. Buda could expect to be impacted with debris and possible utility interruptions during an unlikely and unprecedented event that exceeds the 500 -year probability event scenario run in HAZUS. If an event of this magnitude were to incapacitate a roadway, emergency responders would be hindered from responding, leaving residents at risk.

The following local roadways are crossed by the USGS fault lines displayed on Figure BA.8: RM 967, Pine Siskin, FM 1626, Cement Plant Road, Oxbow Trail and Remuda Trail. Critical facilities that are located near the fault lines (according to HAZUS and community submitted critical facility data) include Elm Grove Elementary School, which is located only 0.2 miles away. Dahlstrom Middle School is also located directly adjacent to a fault line on the west side of the City.





Pages 27, 28, and 29 Dam/Levee Failure have been redacted from this copy of the plan.

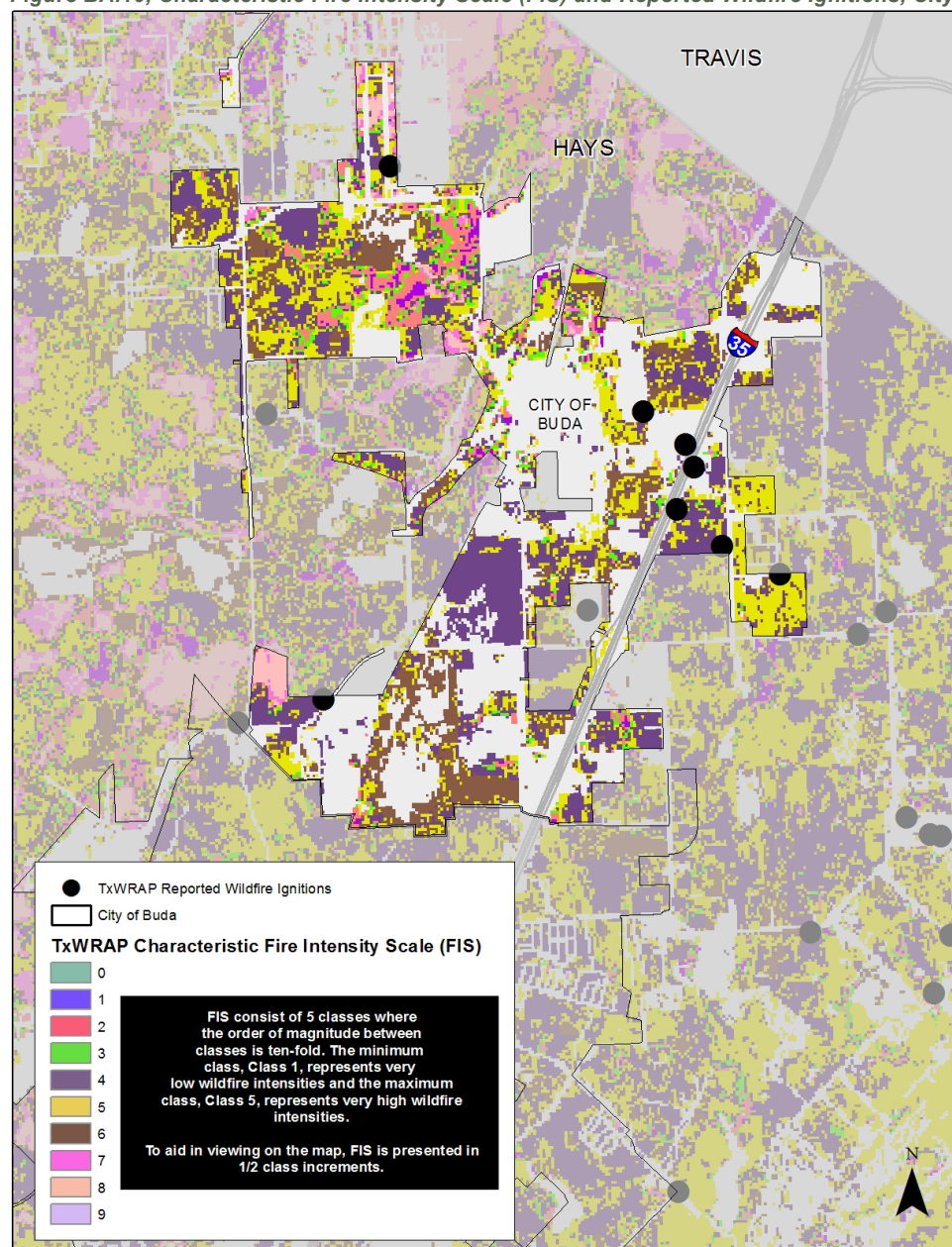


Wildfires

Wildfires: Location

Wildfires can be ignited from a variety of sources including lightning or human activity such as campfires, smoking, arson, or equipment use. The Texas A&M Forest Service's Texas Wildfire risk assessment Portal (TxWRAP) can be used to help communities understand their wildfire risk. Figure BA.10 below shows the location of TxWRAP's documented wildfire occurrences with Fire Intensity Scale (FIS) classifications within the City of Buda. TxWRAP identifies FIS areas as those where wildfire fuels and associated potential dangerous fire behavior exist, based on a weighted average of 4 percentile weather categories.

Figure BA.10, Characteristic Fire Intensity Scale (FIS) and Reported Wildfire Ignitions, City of Buda



(Texas A&M Forest Service, 2016)





Wildfires: Previous Occurrences

Table BA.11 shows the reported wildfire ignitions within the City of Buda, according to TxWRAP and USGS Federal Fire Occurrence data from the years 1980 to 2015.

Table BA.11, Wildfire Ignitions, City of Buda

FPA ID	Date	Fire Size (Acres)
SFO-TX02240706-16701	1/7/2006	3
SFO-TX0483-74168	10/10/2008	6
TFS-TXFD2011-328665	1/1/2011	0.1
TFS-TXFD2011-328676	2/18/2011	0.25
TFS-TXFD2011-328684	5/5/2011	0.01
TFS-TXFD2011-328693	6/16/2011	2
NA	NA	0.1
NA	NA	0.1

N/A - Data not available



Wildfires: Extent and Probability

Table BA.12 lists the Fire Intensity Acreage for the City, according to TxWRAP. For a description of the FIS, refer to Chapter 2, the risk assessment of the main plan document.

Table BA.12, Fire Intensity Acreage, City of Buda

Class	Acres	Percent
Non-Burnable	1,386	41.4 %
1 (Very Low)	47	1.4 %
1.5	184	5.5 %
2 (Low)	63	1.9 %
2.5	583	17.4 %
3 (Moderate)	598	17.9 %
3.5	398	11.9 %
4 (High)	46	1.4 %
4.5	45	1.3 %
5 (Very High)	0	0.0 %
Total	3,350	100.0 %

Based on 8 reported events in 35 years, the City of Buda future probability for a wildfire event is approximately once every 4 years (on average), with up to a potential fire intensity of 4.5, or “High” classification on the TxWRAP FIS.



Wildfires: Impact

Impact on the community can be measured using TxWRAP Housing Density levels within the WUI. Areas with a higher housing and population density would be affected to a greater extent than rural areas, especially in areas near burnable fuels. In the event of a wildfire in high density areas of population, residential structures would be damaged or destroyed, critical infrastructure such as water, sewer and electrical services would be interrupted and residents would experience injury or loss of life. Table BA.13 below lists the population, percent of total population, WUI

acreage and percent of WUI acreage for the City of Buda, according to the Texas A&M Forest Service TxWRAP Community Summary Report.

Table BA.13, WUI Acreage, City of Buda

Housing Density	WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
LT 1hs/40ac	8	0.2 %	260	9.4 %
1hs/40ac to 1hs/20ac	2	0.0 %	131	4.7 %
1hs/20ac to 1hs/10ac	42	0.9 %	345	12.5 %
1hs/10ac to 1hs/5ac	90	1.9 %	381	13.8 %
1hs/5ac to 1hs/2ac	297	6.1 %	469	17.0 %
1hs/2ac to 3hs/1ac	4,343	89.5 %	1,160	42.1 %
GT 3hs/1ac	68	1.4 %	9	0.3 %
Total	4,850	100.0 %	2,755	100.0 %

Wildfires: Vulnerability Summary

Fire and Emergency Services are provided to the 10,162 residents and 3,238 households of Buda (population from Buda EDC demographic data) and surrounding 75 square mile area by Emergency Services District #8 (www.budafire.org). The station is located in Buda and has a response time of approximately 3 minutes in town. As the fastest growing population center in Texas with a population over 10,000, Buda has a population growth rate of 14.87% (according to the Buda Economic Development Corporation) and has increased 39.3% since 2010. This rate of growth and amount area covered by the fire response capabilities increases the need of mitigating wildfire risk to the over 4,800 single family homes that will make up the fully built-out 15 subdivisions in the community. Residents of Buda are vulnerable to the risk of an in-availability of services created by this large increase in growth.

Hydrant pressure can be lowered in some subdivisions during water shortage events, however a recent new potable water supply well may help with this issue. Low water pressure for hydrants would affect fire suppression capabilities, leaving structures at risk. The City of Buda's current ISO Public Protection Classification is 3 (TX Department of Insurance, State Fire Marshall's Office, January 11, 2010).



2.2 Risk Ranking Result

On January 12, 2017, members of the City of Buda MPC completed a questionnaire as part of the Hays County Hazard Mitigation Plan Update: Risk Assessment. The questions covered the risk associated with the hazards that affect each community based on the level of concern over each profiled hazard, the hazards' impact on health & safety, as well as impact to property and business continuity. The answers from this questionnaire were combined with public survey results on perception of risk. The values from both sources were analyzed using the Halff Risk Ranking Tool (details regarding the risk ranking tool are in Chapter 2, the risk assessment portion of the main plan document). The results provided a quantified ranking of risk, with values ranging from 0 to 100. The results for Buda are shown below (hazard values shown from highest risk to lowest):

Ranking Order	Hazard	Risk Ranking Value
1	Drought	97.5
2	Tornadoes	89.0
3	Severe Winter Storms	86.7
4	Floods	77.3
5	Wind Storms	53.3
6	Extreme Heat	53.2
7	Lightning	52.6
8	Wildfire	51.9
9	Expansive Soils	51.6
10	Hail Storms	49.5
11	Earthquakes	40.1
12	Dam/Levee Failure	38.3
13	Hurricanes Tropical Storms	37.5
-	Land Subsidence	Not Profiled



Section 3: Mitigation Strategy

This section examines the community's ability to perform mitigation (a review of existing capabilities is shown in Table BA.14) and identifies specific mitigation actions to address vulnerabilities for each hazard profiled in the Hays County HMP Update. The mitigation strategy is the application of actions into an approach for performing structural and non-structural mitigation efforts within the jurisdiction. Actions are also prioritized and considered for incorporation into other community programs, regulations, projects or plans.

Completed and canceled actions are also included in a separate section for future reference.

3.1 Existing Capabilities

Table BA.14, Existing Capabilities

Capability Name	Capability Type	Ability to Expand/Improve
Mayor	Elected Official	Provides political support for approving and funding mitigation actions. Could attend mitigation information session to learn about community risks and mitigation strategy.
Council Members	Elected Officials	Supplements political support for implementation of mitigation actions. Could attend mitigation information session to learn about community risks and mitigation strategy.
Emergency Management Coordinator	Contract Staff	Coordinates MPC, implementation of mitigation actions, and monitoring/evaluation/updating HMP. Hire full-time EMC.
Floodplain Administrator	City Staff	Ensures enforcement of existing flood damage prevention ordinance, and continued compliance with NFIP requirements. Attend advanced floodplain management training.
Civil Engineer	City Staff and Consultants	Provides expertise and guidance for structural mitigation actions. Attend advanced floodplain management training.
Chief Building Official	City Staff	Collaborates with MPC on ensuring compliance with existing mitigation-related building requirements and consideration of new building practices to increase mitigation. Attend advanced floodplain management training.
Community Planner	City Staff	Considers HMP-identified risk areas when consulting with community planning stakeholders. Participate in MPC.
GIS Coordinator	City Staff	Can graphically demonstrate changes in development and changes in hazard areas. Track damage data geographically for future risk analysis.
Parks and Recreation Director	City Staff	Assists in identifying opportunities for integration of mitigation activities into long-term park development plans. Can also assist with coordinating public outreach events. Participate in Mitigation Planning Committee.
Economic Development Director	Corporation Staff	Can integrate mitigation into future development plans and practices.
Police Chief	City Staff	Assists with flood-related traffic control and evacuation planning. Participate in Mitigation Planning Committee.



Table BA.14, Existing Capabilities, (cont.)

Capability Name	Capability Type	Ability to Expand/Improve
Fire Chief	City Staff	Assist with wildfire-related mitigation through existing programs and efforts. Can assist with the implementation of new wildfire mitigation measures.
Chapter 211 of the Local Government Code: Zoning	Authority	Authorizes the City to regulate Zoning (State of Texas, 1987) (State level code)
Chapter 213 of the Local Government Code: Municipal Comprehensive Plans		Authorizes the City to adopt a comprehensive plan for the long-range development of the City (State of Texas, 1997) (State level code)
Chapter 214 of the Local Government Code		Authorizes the City to have regulatory authority as it related to building code (such as structural integrity and plumbing) (State of Texas, 1995) (State level code)
Section 7.03 Buda Code of Ordinances- Comprehensive Plan	Ordinance	Authorizes the Planning and Zoning Commission to prepare a Comprehensive Plan for Buda (City of Buda, 2017), can directly refer to Mitigation Plan risk assessment for integration into comprehensive planning efforts.
Ordinance No. 080415-1- Amending Parks and Open Space Requirements of Unified Development Code		Establishes easements, land dedication, or a fee-in lieu of payment for the acquisition and development of park land. This is an integral part of the procedure for planning and developing property or subdivisions in the City. Mitigation consideration during applications for Park Land Dedication could serve as opportunity to ensure hazardous Wildland Urban Interface is not developed.
Article 24.07 Illicit Discharges of Pollutants into the MS4 or Conveyances		Regulates non-stormwater discharges to the storm drainage system by controlling the introduction of pollutants into the municipal separate storm sewer system (MS4). Can be enhanced to add language that specifically prohibits unauthorized or private dams in a conveyance, as that is also prohibited in the Flood Prevention Ordinance (as an encroachment in a floodway). Encroachments that cause a rise in the Base Flood Elevation can be considered debris and debris can be considered encroachments. This would allow for a criminal penalty to be given, resulting in a \$2,000 fine. (City of Buda, 2017)
Unified Development Code	Building Code	Codes dedicated to promoting public health, safety, general welfare and quality of life to the citizens of Buda. Can include higher standards for flood. Could also include Mitigation Planning Committee Planners as Review Authorities during code updates to look for opportunities to incorporate Mitigation practices (City of Buda Planning & Engineering, 2015)
Sales Tax	Funding	Provides potential funding for hazard mitigation items.
Property Tax		
Franchise Tax		
Permitting and Licensing Fees		
Capital Improvement Plan Funding		Budget dollars obligated to projects over a 5 year plan that involve multiple mitigation related actions.



Table BA.14, Existing Capabilities, (cont.)

Capability Name	Capability Type	Ability to Expand/Improve
Helicopter Rescue Drill Partnerships	Programs	Partnership between Buda Fire Department and Texas Department of Public Safety to perform simulated helicopter rescues for aircraft and swift water technicians to practice rescues from locations such as roof tops, trees and vehicles. This demonstration for flash flood preparedness could be enhanced through the incorporation of flood mitigation outreach and education.
Police Outreach Programs		A community involvement and outreach effort that can be utilized to promote hazard education and awareness
Fire Department Citizen Fire Academy		Public program available to citizens to learn about the services provided to them by the City of Buda. This could be enhanced to include mitigation education for additional hazards.
Buda City Government Lessons for Schools		An outreach program that teaches school children about City government. This program could also provide children with hazard awareness and simple mitigation best practice advice.
Stormwater Program		Controls surface water as a flood control system to allow water from heavy waterways to avoid flooding and can be enhanced to protect more areas
Office of Emergency Management		Leadership, support and coordination during disasters in the community. This City program can lead mitigation efforts by conducting plan updates and maintenance while also working mitigation measures into other parts of their operations.
Wastewater Department	Public Works	Treats 1.5 million gallons of water a day and can be enhanced assist with conservation methods
Water Department	Public Works	Ensures the delivery of water to citizens in Buda and can take enhanced measures to help conserve
Buda Connect Mobile App	Tool	Mobile phone application that residents can use to make requests, contact the City, pay bills, apply for permits and receive alerts. The app could be enhanced to receive photo submissions of disaster data post-events to assist with ensuring proper permitting is conducted where damage occurred. The tool could also take suggestions for locations that need mitigation actions.

3.2 National Flood Insurance Program Participation

City of Buda participates in the National Flood Insurance Program. The City Engineer serves as the Floodplain Administrator (FPA) and is a Certified Floodplain Manager (CFM). Floodplain management is integrated into their existing functions. Their flood damage prevention ordinance exceeds NFIP's minimum standards by incorporating a 2-foot freeboard. The City will continue to explore options for higher standards, including participation in the Community Rating System.

The City of Buda has a total of 64 NFIP policies in force, as of June 2016. This totals \$16,193,800 in total insurance coverage.



Buda Connect Mobile Phone App

3.3 Mitigation Goals

The plan-level Mitigation Goals can be found in Chapter 3, The Mitigation Strategy portion of the Hays County HMP Update. These apply to each community and were mutually decided upon as the guiding goals for the development of actions in each planning area.

3.4 Mitigation Actions

*E= Actions reducing risk to existing buildings and infrastructure

*F= Actions reducing risk to new development and redevelopment

Number/Title	Hazard	Item Description	Implementation Agency	
1 Reduce flood losses in West Goforth Rd, Buda Fire Station/FM 2770, and Bluff St Drainage Project Area (2014 Drainage Master Plan Phase 1 Project OTS2, OTS3, & OTS4)	Flood	Up-sizing and improving existing channel and culverts along West Goforth Road and the Union Pacific Railroad line; constructing a relief channel from Buda Fire Station under FM 2770 to the Onion Creek main channel stem. (November 11, 2016 Preliminary Engineering Report)	City of Buda Planning & Engineering Department	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus
\$4,522,000; Funding: 2014 Buda Bond Proposition 4 – Drainage (\$7M)		2017-2018	Ongoing	E
Cost and Benefit Considerations				
This project will remove structures from existing flooding (i.e., water above the finish floor elevation) and reduce road overtopping at selected culvert crossings.				

Number/Title	Hazard	Item Description	Implementation Agency	
2 Reduce flood losses in Houston Street Drainage Project Area (2014 Drainage Master Plan Phase 1 Project OTN1)	Flood	Improving Railroad Branch and Old Town North tributaries from East Street to Rose Street. (November 11, 2016 Preliminary Engineering Report)	City of Buda Planning & Engineering Department	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus
\$1,041,000; Funding: 2014 Buda Bond Proposition 4 – Drainage (\$7M)		2017-2018	Ongoing	E
Cost and Benefit Considerations				
This project will remove structures from existing flooding (i.e., water above the finish floor elevation) and reduce road overtopping at selected culvert crossings.				



Hays County Hazard Mitigation Plan, City of Buda Annex

Number/Title	Hazard	Item Description	Implementation Agency
3 Reduce flood losses in Oxbow Subdivision Drainage Project Area (2014 Drainage Master Plan Phase 1 Project GCT1)	Flood	Up-sizing existing culverts at Remuda Trail, Oxbow Trail, and Bullwhip Pass; and up-sizing the existing channel from upstream of Bullwhip Pass to upper limits of Coves at Cimarron Pond. (November 11, 2016 Preliminary Engineering Report)	City of Buda Planning & Engineering Department
Cost Estimate/Funding		Schedule	Status as of 2017 *Risk Focus
\$1,437,000; Funding: 2014 Buda Bond Proposition 4 – Drainage (\$7M)		2017-2018	Ongoing E
Cost and Benefit Considerations			
This project will remove structures from existing flooding (i.e., water above the finish floor elevation) and reduce road overtopping at selected culvert crossings.			

Number/Title	Hazard	Item Description	Implementation Agency
4 Reduce flood losses in Lifschutz Headwaters Drainage Project Area (2014 Drainage Master Plan Phase 1 Project BV1)	Flood	Voluntary, targeted buyouts for 1 or more affected properties. (November 11, 2016 Preliminary Engineering Report)	City of Buda Planning & Engineering Department
Cost Estimate/Funding		Schedule	Status as of 2017 *Risk Focus:
TBD		TBD/as need is identified	Ongoing E
Cost and Benefit Considerations			
This project will remove entire residential structures from lots with existing flood.			

Number/Title	Hazard	Item Description	Implementation Agency
5 Reduce flood losses through construction of a permanent Flood Early Warning System (FEWS) installation at the Onion Creek Bridge on RM 967	Flood	Monitoring of precipitation, stream levels, and water rise at low water crossings at the designated project location 24 hours a day, 365 days a year. During a flood event, City staff and emergency management personnel will be able to work more closely for effective and timely community response.	City of Buda Planning & Engineering Department and Public Works Department
Cost Estimate/Funding		Schedule	Status as of 2017 *Risk Focus
\$121,928; Funding: TWDB Disaster Contingency Fund Flood Protection Planning Grant (50%) and City of Buda General Fund & In-Kind Services (50%)		2017-2018	Ongoing E
Cost and Benefit Considerations			
This project will help improve safety in flood prone areas of the City of Buda; will be compatible with and enhance the existing FEWS network within Hays County; and provide flood monitoring data to further support future flood mitigation efforts. Not independently cost-effective, but critical for minimizing loss of life and injuries during flood events.			



Hays County Hazard Mitigation Plan, City of Buda Annex

Number/Title	Hazard	Item Description	Implementation Agency
6 Reduce flood losses through construction of a permanent Flood Early Warning System (FEWS) installation at Cole Springs Road and RM 967	Flood	Monitoring of precipitation, stream levels, and water rise at low water crossings at the designated project location 24 hours a day, 365 days a year. During a flood event, City staff and emergency management personnel will be able to work more closely for effective and timely community response.	City of Buda Planning & Engineering Department and Public Works Department

Cost Estimate/Funding	Schedule	Status as of 2017	*Risk Focus
\$216,894; Funding: TWDB Disaster Contingency Fund Flood Protection Planning Grant (50%) and City of Buda General Fund & In-Kind Services (50%)	2017-2018	Ongoing	E

Cost and Benefit Considerations
This project will help improve safety in flood prone areas of the City of Buda; will be compatible with and enhance the existing FEWS network within Hays County; and provide flood monitoring data to further support future flood mitigation efforts. Not independently cost-effective, but critical for minimizing loss of life and injuries during flood events.

Number/Title	Hazard	Item Description	Implementation Agency
7 Reduce flood losses through construction of a permanent Flood Early Warning System (FEWS) installation at the Garlic Creek Culvert on RM 967	Flood	Monitoring of precipitation, stream levels, and water rise at low water crossings at the designated project location 24 hours a day, 365 days a year. During a flood event, City staff and emergency management personnel will be able to work more closely for effective and timely community response.	City of Buda Planning & Engineering Department and Public Works Department

Cost Estimate/Funding	Schedule	Status as of 2017	*Risk Focus
\$122,962; Funding: TWDB Disaster Contingency Fund Flood Protection Planning Grant (50%) and City of Buda General Fund & In-Kind Services (50%)	2017-2018	Ongoing	E

Cost and Benefit Considerations
This project will help improve safety in flood prone areas of the City of Buda; will be compatible with and enhance the existing FEWS network within Hays County; and provide flood monitoring data to further support future flood mitigation efforts. Not independently cost-effective, but critical for minimizing loss of life and injuries during flood events.

Number/Title	Hazard	Item Description	Implementation Agency
8 Reduce flood losses through construction of a permanent Flood Early Warning System (FEWS) installation on Bluff Street south of RM 967	Flood	Monitoring of precipitation, stream levels, and water rise at low water crossings at the designated project location 24 hours a day, 365 days a year. During a flood event, City staff and emergency management personnel will be able to work more closely for effective and timely community response.	City of Buda Planning & Engineering Department and Public Works Department

Cost Estimate/Funding	Schedule	Status as of 2017	*Risk Focus
\$122,962; Funding: TWDB Disaster Contingency Fund Flood Protection Planning Grant (50%) and City of Buda General Fund & In-Kind Services (50%)	2017-2018	Ongoing	E

Cost and Benefit Considerations
This project will help improve safety in flood prone areas of the City of Buda; will be compatible with and enhance the existing FEWS network within Hays County; and provide flood monitoring data to further support future flood mitigation efforts. Not independently cost-effective, but critical for minimizing loss of life and injuries during flood events.



Hays County Hazard Mitigation Plan, City of Buda Annex

Number/Title	Hazard	Item Description	Implementation Agency	
9 Reduce flood losses through construction of a permanent Flood Early Warning System (FEWS) installation at Main Street at Bradfield Park	Flood	Monitoring of precipitation, stream levels, and water rise at low water crossings at the designated project location 24 hours a day, 365 days a year. During a flood event, City staff and emergency management personnel will be able to work more closely for effective and timely community response.	City of Buda Planning & Engineering Department and Public Works Department	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus
\$122,962; Funding: TWDB Disaster Contingency Fund Flood Protection Planning Grant (50%) and City of Buda General Fund & In-Kind Services (50%)		2017-2018	Ongoing	E
Cost and Benefit Considerations				
This project will help improve safety in flood prone areas of the City of Buda; will be compatible with and enhance the existing FEWS network within Hays County; and provide flood monitoring data to further support future flood mitigation efforts. Not independently cost-effective, but critical for minimizing loss of life and injuries during flood events.				

Number/Title	Hazard	Item Description	Implementation Agency	
10 Provide training for local floodplain administrators and Certified Floodplain Managers (previously action 3 in 2011 plan)	Flood	Providing floodplain management training by hosting NFIP compliance courses, and hosting TFMA and ASFPM approved workshops; assisting stakeholders and providing continuing education credits for local floodplain administrators, certified floodplain managers, Engineers, Surveyors, and the general public.	City of Buda Planning & Engineering Department	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus
\$250; Existing staff resources/in-kind and annual department budget allocations		Annually 2017 - 2022	Ongoing	N/A
Cost and Benefit Considerations				
This action will improve awareness and skills related to floodplain management, flood hazard mitigation, National Flood Insurance Program regulation, flood preparedness, flood warning measures, and flood disaster recovery. Not independently cost-effective.				

Number/Title	Hazard	Item Description	Implementation Agency	
11 Promote flood insurance coverage (previously action 10 in 2011 plan)	Flood	Promoting the importance of flood insurance as a part of the development permitting process; promoting the NFIP through brochure distribution, City website, and press releases.	City of Buda Planning & Engineering Department and Public Information Office	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus
Existing staff resources/in-kind services		Ongoing	Ongoing	N/A
Cost and Benefit Considerations				
This action will seek to promote an offset of undue financial and material burden in recovering from the impact of flooding on private structures. Not independently cost-effective.				



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Number/Title	Hazard	Item Description	Implementation Agency	
12 Increase public awareness of hazard mitigation (Buda 2030 Comprehensive Plan Action Items CF-4.1, CF-4.3, & CF-4.4) (previously action 11 in 2011 plan)	Drought, Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Expansive Soils, Floods, Hurricanes/Tropical Storms, Earthquakes, Dam/Levee Failure, Wildfires	Increasing public awareness of natural hazards and hazardous areas; distributing public awareness information regarding hazards and potential mitigation measures. Promotional sources would include City website, social media, and public education programs. Provide link to HaysInformed on local page.	City of Buda Public Works Department and Public Information Office	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus
Existing staff resources/in-kind		Ongoing	Ongoing	N/A
Cost and Benefit Considerations				
This action will promote a well informed and engaged citizenry and support a high quality of life. Not independently cost-effective.				

Number/Title	Hazard	Item Description	Implementation Agency	
13 Improve emergency communication/warning systems (Buda 2030 Comprehensive Plan Action Items PS-1.1, PS-1.2, & PS-1.3) (previously action 4 in 2011 plan)	Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Floods, Hurricanes/Tropical Storms, Earthquakes, Dam/Levee Failure, Wildfires	Purchasing equipment and training personnel to improve local and Countywide emergency communication.	City of Buda Public Works Department and Police Department	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus
Existing staff resources/in-kind and annual department budget allocations		Ongoing	Ongoing	E
Cost and Benefit Considerations				
This action promotes public safety services through facility development, high quality equipment, adequate staffing, and healthy partnerships. Not independently cost-effective, but critical for minimizing loss of life and injuries during emergencies.				



Hays County Hazard Mitigation Plan, City of Buda Annex

Number/Title	Hazard	Item Description	Implementation Agency	
14 Purchase Equipment to Monitor drought conditions and ground water levels (Buda 2030 Comprehensive Plan Action Item CF-6.1) (previously action 13 in 2011 plan)	Drought	Purchasing equipment and software to improve monitoring and automatically control water use throughout the City's potable water pumping, storage, and distribution network.	City of Buda Public Works Department	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus
Annual Water Conservation Program - \$36,00 / SCADA System Upgrades - \$30,000		Ongoing	Ongoing	N/A
Cost and Benefit Considerations				
This action will ensure water availability for future needs and reduce costs for future water capital infrastructure that can be redirected to other vital needs. Not independently cost-effective.				

Number/Title	Hazard	Item Description	Implementation Agency	
15 Promote awareness of evacuation plans (previously action 21 in 2011 plan)	Floods, Hurr/ Trop, Dam Failure, Wildfire	Ensuring that the community members are aware of and understand notification and evacuation plans related to natural hazards.	City of Buda Public Works Department	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus
Existing staff resources/in-kind		2018-2019	Not started	N/A
Cost and Benefit Considerations				
This action will help reduce fatalities and injuries by improving the ability of the public to react and respond to changing weather conditions. Not independently cost-effective.				

Number/Title	Hazard	Item Description	Implementation Agency	
16 Minimize dam failure risk (previously action 20 in 2011 plan)	Dam/ Levee Failure	Ensuring structural and nonstructural measures are implemented to protect the integrity of the earthen fill dams; requiring that repairs are performed under the guidance of a qualified design professional.	City of Buda Planning & Engineering Department	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus
Existing staff resources/in-kind		Ongoing	Ongoing	E
Cost and Benefit Considerations				
This action will reduce the loss of lives, and public and private property due to dam failure. Not independently cost-effective.				



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Number/Title	Hazard	Item Description	Implementation Agency	
17 Ordinance to mandate engineered slabs and proper building inspections	Expansive Soils	Adopt ordinance requiring design compliance certifications as a condition of release of a structural certificate of occupancy.	City of Buda Planning & Engineering Department	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus
Existing staff resources/in-kind		Ongoing	Ongoing	F
Cost and Benefit Considerations				
This action will reduce the loss of public and private property due to ground movement. Not independently cost-effective.				

Number/Title	Hazard	Item Description	Implementation Agency	
18 Review plans and resources to address risk posed by severe weather events (previously action 16 in 2011 plan)	Severe Winter Storms, Hurricane/Tropical Storms, Windstorms, Hailstorms, Tornadoes	Continuing update of City's current plans and resources to address the risks posed by severe weather hazards focusing on potentially at-risk populations in the community.	City of Buda Planning & Engineering Department and Public Works Department	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus
Existing staff resources/in-kind		Ongoing	Ongoing	N/A
Cost and Benefit Considerations				
This action will help identify shortfalls in staff or material resources to better assist the public during severe weather events. Not independently cost-effective.				

Number/Title	Hazard	Item Description	Implementation Agency	
19 Develop various mitigation actions to reduce wildfire risk (previously action 17 in 2011 plan)	Wildfire	Informing property owners of appropriate actions, clearing vegetation, and monitoring antecedent fire hazard conditions.	City of Buda Planning & Engineering Department and Public Works Department	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus
Existing staff resources/in-kind		2018-2019	Not started	N/A
Cost and Benefit Considerations				
This action will reduce the loss of lives, and public and private property due to wildfire. Not independently cost-effective.				



Hays County Hazard Mitigation Plan, City of Buda Annex

Number/Title	Hazard	Item Description	Implementation Agency	
20 Develop and adopt plans to initiate tree management program	Lightning, Windstorms, Drought, Wildfire	Enhancing Comprehensive Plan goal of establishing a Neighborhood Services Program by utilizing the resource to educate the public on tree care in order to get them to plant drought resistant trees and keep existing trees alive so that dead trees will not impact power lines during wind, severe winter and lightning events.	City of Buda Planning & Engineering Department and Public Works Department	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus
Existing staff resources/in-kind		2018-2019	Not started	N/A
Cost and Benefit Considerations				
This action will minimize interruption of critical infrastructure services due to fallen limbs from drought or windstorm, and minimize debris that could become ignited by lightning causing a wildfire. Not independently cost-effective.				

Number/Title	Hazard	Item Description	Implementation Agency	
21 Construction of Aquifer Storage and Recovery Well	Drought	Construction of well, as part of aquifer storage and recovery project. The overall purpose of the storage and recovery project is to allow for water storage when supplies are available and recovery during periods of drought or water shortage.	City of Buda Planning & Engineering Department and Public Works Department	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus
\$1,896,000 / Capital Improvement Project funding		2018-2019	Not Started	E
Cost and Benefit Considerations				
The cost of this construction will provide long term benefits that will benefit the entire population of Buda through water supply resilience. Not independently cost-effective.				




3.5 Capabilities Assessment

Evaluation/Prioritization of Actions

Each action added to the plan was developed using the Mitigation Action Summary Worksheet shown in Figure BA.11. The cost/benefit calculation occurred on this document.

Figure BA.11, Mitigation Action Summary Worksheet

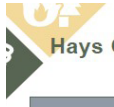


Hays County Hazard Mitigation Plan Update Process
Mitigation Action Summary Worksheet

Community Name: _____

Person completing questionnaire: _____

Mitigation Action/Project Title	
Background/Issue	
Opportunities for Integration	
Responsible Agency	
Partners	
Strategy for Existing Structures	



Hays County Hazard Mitigation Plan Update Process
Mitigation Action Summary Worksheet

Strategy for Future Development	
Potential Funding	
Cost Estimate (Values from "Measuring Costs" fields from Benefit and Cost Review Worksheet)	
Benefits (Statements from the "Difference" fields on the Benefit and Cost Review Worksheet)	
Timeline	
Priority (Based off Priority worksheet)	



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Table BA.15, Mitigation Action Prioritization Tool, City of Buda

Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community	Risk Ranking Score	Total Score
21. Construction of aquifer storage and recovery well	1	0	1	1	0	1	1	1	1	1	98	106
12. Increase public awareness of hazard mitigation	1	1	1	1	0	0	1	1	0	1	98	105
14. Monitor drought conditions and ground water levels	1	0	1	1	0	0	1	1	0	1	98	104
20. Develop plans for tree management	0	1	1	0	0	1	1	1	0	1	97	103
18. Review plans and resources to address risk posed by severe weather events	1	1	1	1	0	0	1	1	0	1	89	96
13. Improve emergency communication/ warning systems	1	0	1	1	0	0	1	1	0	1	89	95
2. Reduce flood losses in Houston Street Drainage Project Area (2014 Drainage Master Plan Phase 1 Project OTN1)	1	1	1	1	0	1	1	1	0	1	77	85
3. Reduce flood losses in Oxbow Subdivision Drainage Project Area (2014 Drainage Master Plan Phase 1 Project GCT1)	1	1	1	1	0	1	1	1	0	1	77	85
4. Reduce flood losses in Lifschutz Headwaters Drainage Project Area (2014 Drainage Master Plan Phase 1 Project BV1)	1	1	1	1	0	1	1	1	0	1	77	85
1. Reduce flood losses in West Goforth Rd, Buda Fire Station/ FM 2770, and Bluff St Drainage Project Area (2014 Drainage Master Plan Phase 1 Project OTS2, OTS3, & OTS4)	1	1	1	1	0	0	1	1	0	1	77	84
5. Reduce flood losses through construction of a permanent Flood Early Warning System (FEWS) installation at the Onion Creek Bridge on RM 967	1	0	1	1	0	0	1	1	1	1	77	84
6. Reduce flood losses through construction of a permanent Flood Early Warning System (FEWS) installation at Cole Springs Road and RM 967	1	0	1	1	0	0	1	1	1	1	77	84
7. Reduce flood losses through construction of a permanent Flood Early Warning System (FEWS) installation at the Garlic Creek Culvert on RM 967	1	0	1	1	0	0	1	1	1	1	77	84
8. Reduce flood losses through construction of a permanent Flood Early Warning System (FEWS) installation on Bluff Street south of RM 967	1	0	1	1	0	0	1	1	1	1	77	84
9. Reduce flood losses through construction of a permanent Flood Early Warning System (FEWS) installation at Main Street at Bradfield Park	1	0	1	1	0	0	1	1	1	1	77	84
16. Minimize dam failure risk	1	1	1	1	0	0	1	1	0	1	77	84
15. Promote awareness of evacuation plans	1	0	1	1	0	0	1	1	0	1	77	83
10. Provide training for local floodplain administrators and Certified Floodplain Managers	0	1	1	1	0	0	1	1	0	0	77	82
11. Promote flood insurance coverage	0	0	1	1	0	0	0	1	0	0	77	80
19. Develop various mitigation actions to reduce wildfire risk	1	1	1	1	0	-1	0	1	1	1	52	58
17. Mandate engineered slabs and proper building inspections	0	1	1	-1	0	0	-1	1	0	1	51	53
21. Construction of aquifer storage and recovery well	1	0	1	1	0	1	1	1	1	1	98	106



Mitigation Actions by Hazard

The mitigation actions are shown with corresponding hazards in Table BA.16 below.

Table BA.16, Mitigation Action Impact, City of Buda

Action Number	Drought	Extreme Heat	Severe Winter Storms	Lightning	Hailstorms	Windstorms	Tornadoes	Expansive Soils	Floods	Land Subsidence	Hurricanes/Tropical Storms	Earthquakes	Dam/Levee Failure	Wildfire
1									x					
2									x					
3									x					
4									x					
5									x					
6									x					
7									x					
8									x					
9									x					
10									x					
11									x					
12	x	x	x	x	x	x	x	x	x		x	x	x	x
13		x	x	x	x	x	x		x		x	x	x	x
14	x													
15									x		x		x	x
16													x	
17								x						
18			x		x	x	x				x			
19														x
20	x			x		x								x
21	x													



3.6 Integration Efforts

Table BA.17 captures ways that the HMP risk assessment, mitigation goals and actions can be integrated into other City of Buda documents, programs and regulations.

Table BA.17, Plan Integration Efforts

Name of Document	Type	Item Type	Process for Integration
Buda 2030 Comprehensive Plan	Comprehensive Plan	Risk Assessment	<p>Integrate MPC member into Comprehensive Planning Team to encourage mitigation actions for future updates for the following actions:</p> <ul style="list-style-type: none"> Trail requirements for new developments or subdivisions (require floodplain administrator review with Risk Assessment data and comment) Location standards for school facilities (to include emergency management and floodplain administrator review with RA data) enhancement Enhance action item for development of Neighborhood Services Department and create a give the department a public safety education mission that includes mitigation and natural hazards <p>Include actions in next Comprehensive Plan update cycle. Receive Comprehensive Plan Committee approval and Council passage for addition of mitigation actions.</p>
Unified Development Code	Building Code	Actions/Risk Assessment	<p>Receive council approval and include recommendations to Building Standards Commission during periods of Code revision and updates in order to look for opportunities to add new mitigation items to the plan, such as</p> <ul style="list-style-type: none"> Add rain gardens and xeriscaping to Green building or green practice requirements Add requirement for evacuation routes to subdivision codes- Connectivity requirements for streets and pedestrian bike paths Incorporate a fire break requirement in codes that “Promote cluster developments” (include fire breaks when near WUI)
Ordinance No. 080415-1- Amending Parks and Open Space Requirements of Unified Development Code	Ordinance	Risk Assessment	<p>Establishes easements, land dedication, or a fee-in lieu of payment for the acquisition and development of park land. This is an integral part of the procedure for planning and developing property or subdivisions in the City. Update review procedures through Parks Department to include MPC member review of applications for Park Land Dedication to possibly serve as opportunity to ensure hazardous Wildland Urban Interface is not developed.</p>
Acquisition of Open Space	Program	Risk Assessment	<p>The last open space acquisition took place on March 15, 2016, during which the City of Buda acquired 39.51 acres of land. This appeared to be acquisitions related to flood control and water conservation efforts. Inclusion of MPC member for acquisition planning activities would ensure additional hazard areas would be considered for future acquisitions to include data from the risk assessment regarding areas susceptible to expansive soils. Utilize HMP maps for review. Compile open space acquisition effort updates and utilize for mitigation planning purposes.</p>



Table BA.17, Plan Integration Efforts , (cont.)

Name of Document	Type	Item Type	Process for Integration
Hazard Mitigation Grant Program (HMGP)	Funding	Action	Identify actions that can be funded through new and existing grant awards. Review existing mitigation actions for eligibility for the grant program, to include Benefit Cost consideration. Prepare grant application documents in advance to prepare for future grant application periods. Process involves identification of actions from Plan; obtaining Council approval to apply; notification of interest in grant to the public; completion of application for funding; if awarded, obtaining Council approval to accept; if accepted, administration of funds and implementation of project.
Pre-Disaster Mitigation (PDM)	Funding	Action	Identify actions that can be funded through new and existing grant awards. Review existing mitigation actions for eligibility for the grant program, to include Benefit Cost consideration. Prepare grant application documents in advance to prepare for future grant application periods. Process involves identification of actions from Plan; obtaining Council approval to apply; notification of interest in grant to the public; completion of application for funding; if awarded, obtaining Council approval to accept; if accepted, administration of funds and implementation of project.
Flood Mitigation Assistance (FMA)			
TWDB Flood Protection Planning (FPP) Grant			
TWDB Clean Water State Revolving Fund (CWSRF)			Identify actions that can be funded through new and existing loans. Review existing mitigation actions for eligibility for the loan program, to include Benefit Cost consideration. Prepare loan application documents in advance to prepare for future application periods.
Texas Water Development Fund (DFund)			Process involves obtaining Council approval to apply; notification of interest in loan to the public; completion of application for loan; if awarded, obtaining Council approval to accept; if accepted, administration of funds and implementation of project.

Incorporation Achievements Since Previous Plan Update

The City of Buda incorporated the HMP into other planning mechanisms as a demonstration of progress in local hazard mitigation efforts. This was achieved by identifying MPC planners and or stakeholders to participate in the following local planning efforts:

- Buda 2030 Comprehensive Plan
- Master Transportation Plan
- City of Buda Drainage Master Plan: Phase 1
- City of Buda Space Needs Assessment and Facilities Master Plan
- 2015 Downtown Master Plan for Buda, TX
- City of Buda 5-Year Capital Improvement Plan
- Buda Economic Development Strategic Plan
- City of Buda Drought Contingency Plan



[illegible]

Buda has experienced a significant boom of residential and industrial development due in great part to a significant population growth of 205% since 2000. In 2013, the City approved 456 new residential building permits, and now is home to over 15 subdivisions that at full build-out will home 4,800 families. With a population requiring more infrastructure and resources, vulnerability to natural hazards increases.

Finalize Plan Update



4.2 Progress in Mitigation Efforts

Past Mitigation Action Progress Reports Summary- Completed and Canceled

2011 Action Number	Hazard	Item Description	Lead Department
2	Flood	Adopt Higher Standard Flood Damage Prevention Ordinance	Engineering Department
Cost Estimate/Funding		Schedule	Status as of 2017
Existing Staff Resources		6 months	Completed.
Cost Effectiveness			
No independently cost-effective, but critical for reducing property damage and minimizing loss of life and injuries during flood events			

2011 Action Number	Hazard	Item Description	Lead Department
5	All Hazards	Development of and maintenance of Countywide and individual community HAZMAP Plan	Public Works
Cost Estimate/Funding		Schedule	Status as of 2017
Existing staff resources		Original Plan adopted on April 20, 2004	Canceled. Not an eligible action.
Cost Effectiveness			
Not independently cost-effective			

2011 Action Number	Hazard	Item Description	Lead Department
6	Thunderstorms, high winds, cyclones, tornadoes and floods	Storm Ready Designation for Hays County Communities	Public Works
Cost Estimate/Funding		Schedule	Status as of 2017
Existing staff resources		Phased over 5 years, 2006-2010	Canceled. Designation is not currently a priority for the community.
Cost Effectiveness			
Not independently cost			



Hays County Hazard Mitigation Plan, City of Buda Annex

2011 Action Number	Hazard	Item Description	Lead Department
7	Extreme Heat	Reduce Impacts on Extreme Heat on Elderly, Disabled, Low-Income and Infants	Public Works
Cost Estimate/Funding		Schedule	Status as of 2017
\$2,000 to purchase and distribute 100 box fans \$3,000 estimated costs for a/c repairs Funding Sources: United Way, Rotary Clubs, Lions Clubs, Red Cross, Churches and charitable organizations, power companies		Ongoing, as needed during events	Canceled. Short-staffed for this type of coordination
Cost Effectiveness			
Not independently cost-effective			
2011 Action Number	Hazard	Item Description	Lead Department
12	Wildfire	Wildfire Hazard Areas	Public Works
Cost Estimate/Funding		Schedule	Status as of 2017
\$500		TBD, likely initiated in 2011	Removing from plan because it is a County run project to enter Fire-wise and not specific to the jurisdiction.
Cost Effectiveness			
Not independently cost-effective, but essential in minimizing loss of life and injuries during significant storms			
2011 Action Number	Hazard	Item Description	Lead Department
14	Drought	Public Information Campaign for Water Use	Public Works
Cost Estimate/Funding		Schedule	Status as of 2017
No additional cost- uses existing staff resources.		TBD, likely initiated in 2011	Combined with 2011 Action 13 to monitor drought conditions now a part of 2017 Plan Action 26) Program to Monitor Drought Conditions and Groundwater levels.
Cost Effectiveness			
Very difficult to determine but presumed very cost-effective because actions preserves essential function			
2011 Action Number	Hazard	Item Description	Lead Department
15	Extreme heat	Evaluate Excess Heat Risks	Public Works
Cost Estimate/Funding		Schedule	Status as of 2017
No additional cost- uses existing staff resources		TBD- probably initiated in 2011	Removed due to the item no longer qualifying as an eligible mitigation action.
Cost Effectiveness			
Not independently cost-effective, but needed to develop adequate risk reduction efforts			



2011 Action Number	Hazard	Item Description	Lead Department
18	Flood, thunderstorms, high winds, tornadoes, seismic	Upgrades to At-Risk Structures	Engineering, Planning, Public Works, Fire Dept
Cost Estimate/Funding		Schedule	Status as of 2017
Varies depending on measure. Funding from General Fund or FEMA grant program/s		TBD based on study	Modified to be a specific action of mitigating new City Hall Annex structure.
Cost Effectiveness			
Cost-effectiveness will vary with level of risk and project cost.			

2011 Action Number	Hazard	Item Description	Lead Department
19	Floods, thunderstorms, high winds, tornadoes, seismic	Structural/Engineering Study of Public Facilities	Engineering, Planning, Public Works, Fire Dept
Cost Estimate/Funding		Schedule	Status as of 2017
To be determined, but if initiated probably from General Fund		Not yet established- to be commenced only if funding is available	Completed. See City of Buda Space Needs Assessment and Facilities Master Plan in Sources (Section 1
Cost Effectiveness			
Not independently cost-effective			

4.3 Changes in Priorities

Plan-level priority changes are reflected in the changes to the plan-level goals shown in Chapter 3: Mitigation Strategy within the Main Plan document.

Local changes include development for Buda and an impact on the community water supply that has led to a significant shift of priorities toward ensuring that water conservation is a consideration during mitigation planning efforts. The Economic Development Council provides action items as part of the EDC Strategic plan regarding creating an availability of water, as the accessibility is critical to growth and development. In addition, the Buda Comprehensive Plan also has objectives that concern conservation and preservation practices. Other changes in priorities include the change of mitigation goals and addition of several new hazards for risk assessment.





Section 5: Approval and Adoption

5.1 Approval and Adoption Procedure

The procedures for approval and adoption are described in Chapter 4.1 of the Hays County HMP Update.

Table BA.18, Municipal Jurisdiction Adoption Date

Municipality	APA Date	Adoption Date
City of Buda		



Jurisdiction Adoption Documentation Placeholder

References

- Buda Economic Development Corporation. (2017, 03 11). BudaTx Economic Development Corp. Retrieved from Utilities: <http://budaedc.com/utilities>
- Buda Economic Development Corporation. (2017, 03 11). BudaTX EDC. Retrieved from Community Profile: <http://budaedc.com/community-profile>
- City of Buda. (2017, 03 01). Buda Code of Ordinances. Retrieved from Section 7.03 Comprehensive Plan: <http://z2.franklinlegal.net/franklin/Z2Browser2.html?showset=budaset>
- City of Buda. (2017, 03 11). BudaTx. Retrieved from Home Page: <http://www.ci.buda.tx.us/>
- City of Buda. (2017, 03 01). Document Center. Retrieved from Article 24.07 Illicit Discharges of Pollutants into the MS4 or Conveyances : <http://www.ci.buda.tx.us/DocumentCenter/View/2554>
- City of Buda Engineering. (2015). City of Buda 5 Year Capital Improvement Plan FY 15-16 through FY 19-20. Buda, TX: City of Buda.
- City of Buda Office of Emergency Management. (n.d.). City of Buda Flood Emergency Warning System Proposal. Buda, TX: City of Buda .
- City of Buda Planning & Engineering. (2015). Unified Development Code. Buda, TX: City of Buda.
- Freese and Nichols, Inc. (2015). City of Buda Drainage Master Plan, Phase 2. Austin, TX: Freese and Nichols, Inc.
- Geology.com. (2016, 12 01). Expansive Soil: The hidden force behind basement and foundation problems. Retrieved from Soil Article: <http://geology.com/articles/soil/>
- Halff Associates. (2011). Buda 2030 Comprehensive Plan. Austin, TX: Halff Associates.
- Halff Associates. (2012). The 2012 Buda Parks, Recreation, Trails and Open Space Master Plan. Austin, TX: Halff Associates.
- Halff Associates. (2015). 2015 Downtown Master Plan for Buda, TX. Austin, TX: Halff Associates.
- ISO Building Code Effectiveness Grading Schedule (BCEGS). (2014). Buda Building Code Enforcement Agency 11/10/2014 Evaluation. Insurance Services Office, Inc., 2013.
- Lockwood, Andrews & Newnam, Inc. (2014). City of Buda Drainage Master Plan Phase 1. Austin, TX: LAN.
- Lockwood, Andrews & Newnam, Inc. (2013). City of Buda Transportation Master Plan Update. San Marcos, TX: Lockwood, Andrews & Newman, Inc.
- National Fire Protection Association. (2013, June). NFPA News & Research. Retrieved from Lightning Fires and Lightning Strikes: <http://www.nfpa.org/news-and-research/fire-statistics-and-reports/fire-statistics/fire-causes/lightning-fires-and-lightning-strikes>
- National Flood Insurance Program. (2016). Repetitive and Severe Repetitive Loss Report for Hays County. Denton, TX: Federal Emergency Management Agency.
- National Highway Traffic Safety Administration. (2017, 03 11). Traffic Safety Facts. Retrieved from Texas 2011-2015: <https://cdan.nhtsa.gov/SASStoredProcess/guest>
- National Oceanic and Atmospheric Administration. (2016). Historical Hurricane Tracks. Retrieved from National Oceanic and Atmospheric Administration Coastal Management: <https://coast.noaa.gov/hurricanes/>
- National Oceanic and Atmospheric Administration. (2016, 12 01). National Weather Service Forecast Office- Austin/San Antonio, TX. Retrieved from NOWData- NOAA Online Weather Data: <http://w2.weather.gov/climate/xmacis.php?wfo=ewx>
- National Oceanic and Atmospheric Administration Storm Event Database. (2016, 12 01). National Centers for Environmental Information. Retrieved from Data Access: <https://www.ncdc.noaa.gov/data-access>

- Pegasus. (2013). City of Buda, Texas Economic Development Strategic Plan. Austin, TX: Pegasus.
- State of Texas . (1995, 08 28). Texas Constitution and Statutes. Retrieved from Local Government Code-Title 7. Regulation of Land Use, Structures, Businesses and Related Activities, Subtitle A. Municipal Regulatory Authority, Chapter 214 Municipal Regulation of Housing and Other Structures: <http://www.statutes.legis.state.tx.us/Docs/LG/htm/LG.214.htm>
- State of Texas. (1987, 09 1). Texas Constitution and Statutes. Retrieved from Local Government Code-Title 7. Regulation of Land Use, Structures, Businesses and Related Activities, Subtitle A. Municipal Regulatory Authority, Chapter 211 Municipal Zoning Authority, Subchapter A General Zoning Regulations: <http://www.statutes.legis.state.tx.us/SOTWDocs/LG/htm/LG.211.htm>
- State of Texas. (1997, 09 01). Texas Constitution and Statutes. Retrieved from Local Government Code-Title 7. Regulation of Land Use, Structures, Businesses and Related Activities, Subtitle A. Municipal Regulatory Authority, Chapter 211 Municipal Comprehensive Plans: <http://www.statutes.legis.state.tx.us/Docs/LG/htm/LG.213.htm>
- Texas A&M Forest Service. (2016, 12 01). Wildfire Risk Assessment Portal. Retrieved from Public Viewer: <https://www.texaswildfirerisk.com/>
- Texas Department of Transportation. (2017, 03 11). Crash Records Information System. Retrieved from C.R.I.S Query: <https://cris.dot.state.tx.us/public/Query/#/public/welcome>
- Texas Division of Emergency Management . (2013). State of Texas Hazard Mitigation Plan Update. Austin, TX: Texas Division of Emergency Management.
- Texas Natural Resources Information System. (2011). TNRIS Data Catalog Low Water Crossings. Retrieved from TNRIS: <https://tnris.org/data-catalog>
- Tornado Facts. (2016, 03 16). Tornado Facts and Information . Retrieved from Tornado Scale: <http://www.tornadofacts.net/tornado-scale.php>
- United States Census Bureau. (2017, 03 11). United States Census Bureau. Retrieved from QuickFacts Buda City, Texas: <https://www.census.gov/quickfacts/table/PST045215/4811080>
- USGS Earthquake Hazard Program. (2015). USGS Earthquake Hazard Program. Retrieved from USGS: <https://earthquake.usgs.gov/data/>
- Wester, J. (2016, 05 27). Flood-displaced Buda residents return to soggy homes, fear more rain. Austin American-Statesman.
- Wigninton Hooker Jeffry Architects. (2014). Buda Space Needs Assessment and Facilities Master Plan. Austin, TX: Wigninton Hooker Jeffry Architects.

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THE CITY OF HAYS

City of Hays
Hays County Hazard
Mitigation Plan Update
2018



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City of Hays Annex

Section 1: Organize and Review

This section contains a brief description of the City of Hays and its jurisdictional features. In addition, Section 1 contains the following details regarding the City's:

- participation in the Hays County HMP Update process,
- stakeholder engagement,
- public outreach strategy,
- incorporation efforts and
- plan maintenance procedures.

*Population :	198
Size of Community:	0.21 sq. miles
*Population over 65 years old	36
*Population under 16 years old	37
*Economically Disadvantaged Population (\$0-\$20k)	2
City of Hays is serviced by the following responders:	
Fire & EMS - Buda Fire Department/Buda EMS	
Law Enforcement - Hays County Sheriff's Office	

**Hazus-MH 3.2 Updated Census 2010 Population Projections*

1.1 Community Description

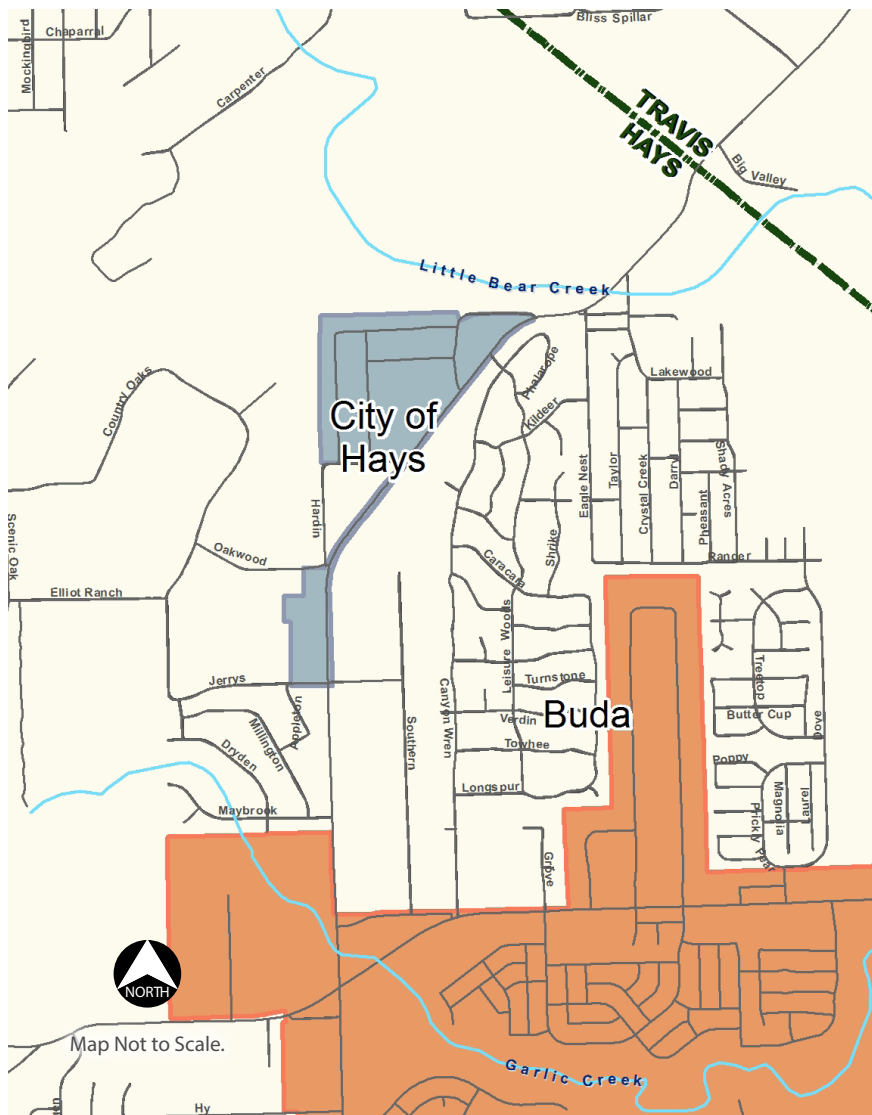
When planning, it is important to take into account the characteristics that make a community unique. Consideration of unique needs when it comes to mitigating or recovering from natural hazards ensures that all members of the community and their needs are addressed.

Hays is located west of Farm to Market Road (FM) 1626 and about a mile and a half from FM 967 to the south and a mile and a half from Brody Lane to the North. Located 3 miles Northwest of Buda, the City of Hays is made up of 6 streets that make up the Country Estates subdivision. FM 1626 serves as the jurisdiction's southeast border.

The City is purely residential and nearly fully developed. There are 90 homes in 1 subdivision that make up the community. Students attend schools within the Hays Consolidated Independent School District.

Hays is governed by a Mayor and 4 City Council members. The community is a General Law City. This provides a limit on tax rates. General Law cities can only take actions allowed by the State legislature, similar to County level enforcement.

Figure HA.1, City of Hays Planning Area





Hays County Hazard Mitigation Plan, City of Hays Annex

City of Hays is 100% residential and does not have any employers besides home-based operations run and operated by community members. (HAZUS scenarios in Section 2, the risk assessment, indicate that there are 5 commercial structures within the community. HAZUS is Federal Emergency Management Agency (FEMA) software used by emergency management professionals to estimate potential losses from disasters. This software bases property counts and values on aggregate census blocks, in the absence of parcel data. These references differ from community input, but are given as simulated values based on National averages.) The City's major utility providers are listed in Table HA.1.

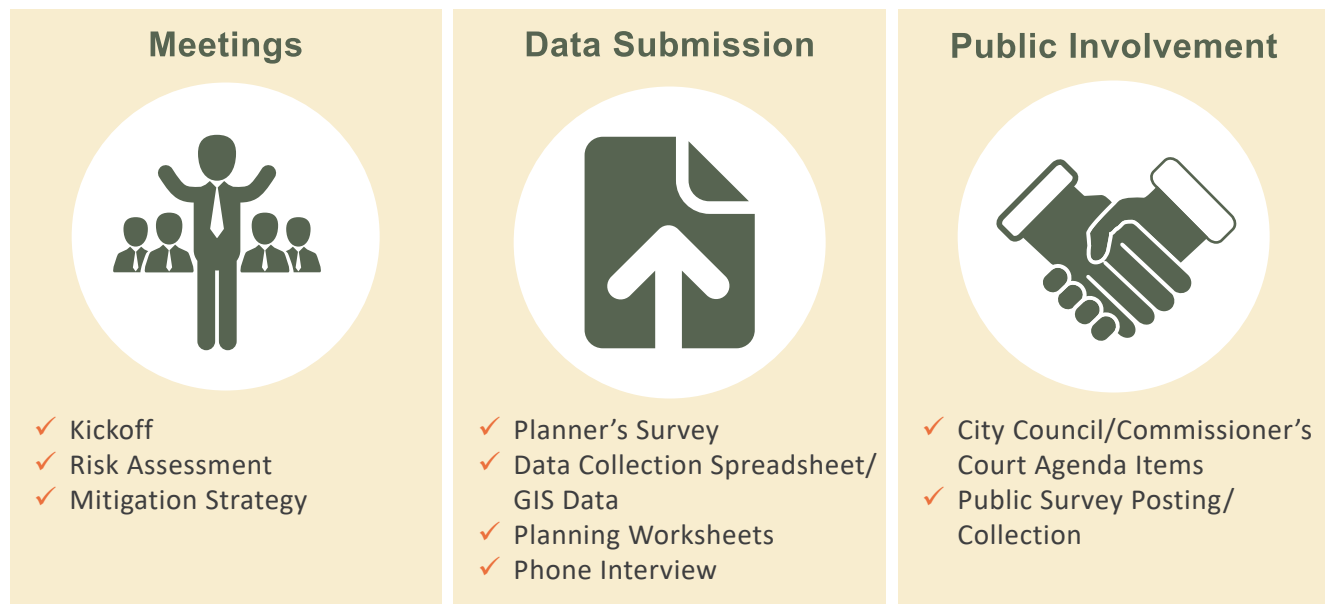
Table HA.1, Utility Providers

Type	Provider
Electric	Pedernales Electric Cooperative (PEC)
Water	Edwards Aquifer through City of Hays Water System

Community Planning Involvement

MPC planning activities for the Hays County Hazard Mitigation Plan (HMP) Update are captured in Figure HA.2, which utilizes check-marks to indicate each of the activities that were completed by the City of Hays MPC.

Figure HA.2, City of Hays Plan Participation



1.2 Outreach Strategy

The City of Hays was very active in the following outreach activities used to request public participation in the Hays County HMP Update.

Public Survey Promotion

The City of Hays advertised the Hays County Hazard Mitigation Plan Update Public Survey through the City of Hays newsletter, *Hays Happenings*, that goes out with the community utility bill.

As of March 10, 2017, the City of Hays had 19 residents respond to the public survey. Details on how the survey data was directly incorporated into the risk ranking process for hazards is included in Chapter 2, the risk assessment portion of the main plan document.



City Council Meeting Announcement

On February 13, 2017, the Mayor presented information on the Hays County Hazard Mitigation Plan Update to the Hays City Council. Elected officials, local agency leaders and members of the public attended the meeting. The council agenda and item report for this presentation is included in Plan Appendix A.

Plan Phase Newsletters

Hays was provided with newsletters at each phase of the planning process in order to be able to share updates with stakeholders, elected officials, City staff and the public. Copies of the newsletters can be found in Plan Appendix A.

Plan Draft Public Review and Comment Period

The link to the draft Hays County HMP (hosted on the Hays County Office of Emergency Services page) was posted on the City of Hays website from July 12, 2017 until July 26, 2017. A hard copy was placed in the Hays City Hall building. No public comments were received during this review period.

1.3 Incorporation of Sources

In addition to stakeholder and public input, the MPC also reviewed other City planning resources that could provide useful information for the plan update process. Table HA.2 lists the documents reviewed and how they were considered for incorporation in the updated plan.

Table HA.2, Review/Incorporation of Sources

Name of Document	Type	How Incorporated
2013 State of Texas Hazard Mitigation Plan	Plan	Utilized hazard definitions and hazard classification names.
Flood Insurance Study	Study	Incorporated best available hydraulic and hydrologic study results for flood hazard profile.
Natural and Cultural Resources Assessment Report: Drainage Improvement Project, City of Hays, Texas	Plan	Review for incorporation of drainage project as action in Mitigation Strategy.
City of Hays Municipal Code	Regulations	Review for possible enhancement to existing laws for mitigation purposes. (City of Hays, Texas, 2014)



Section 2: Risk Assessment

City of Hays Jurisdictional Hazards

This section contains the City of Hays' hazard profiles for each natural hazard included in the Hays County HMP Update. Profiles include:

- Location - the area where the hazard is known to occur
- Previous Occurrences - a history of reported events for the hazard
- Significant Previous Occurrences (when applicable) - notable hazard events within the community
- Extent - the strength or magnitude of the hazard
- Probability - the likelihood of the hazard event occurring in the future
- Impact - the consequence or effect (or possible effect) of hazard events
- Vulnerability Summary - identification of structures, systems, populations or assets susceptible to loss or damage

Hazard descriptions and extent scales for hazard magnitudes are found in Chapter 2, the risk assessment portion of the main plan document.

When available, data specific to the City of Hays was used for hazard analysis. When no instances were reported specifically for the jurisdiction for regional hazards, County level data was applied.

State and national datasets were used to determine occurrence, extent, and the respective probabilities, rather than verbal testimonies, in an effort to retain data consistency. For some hazards, the National Oceanic and Atmospheric Administration (NOAA) Storm Events Database was used as the most comprehensive data available for hazards. The Storm Events Database does not always reflect the most recent totals for fatality, injury and damage amounts shown for previous occurrences. The Previous Occurrences paragraphs identify instances in which this may occur. Verbal testimony, when available, was integrated into impact or vulnerability summaries to account for updates in this data.

2.1 Hazard Profiles

Hazards profiled within the Risk Assessment include:

- Drought - Within Chapter 2, the risk assessment portion of the main plan document.
- Extreme Heat - Within Chapter 2, the risk assessment portion of the main plan document.
- Severe Winter Storms - Within Chapter 2, the risk assessment portion of the main plan document.
- Lightning - Within Chapter 2, the risk assessment portion of the main plan document.
- Hailstorms
- Windstorms
- Tornadoes
- Expansive Soils
- Floods
- Hurricanes/Tropical Storms
- Earthquakes
- Dam/Levee Failure (not profiled for City of Hays)
- Wildfires



Hailstorm

Hailstorms: Location

The entire extent of the City of Hays is exposed to some degree of hail hazard. Since hail can occur at any location, hail events could be experienced anywhere within the jurisdiction.

Hailstorms: Previous Occurrences

While the City of Hays has not had any previous occurrences reported through the NOAA Storm Events Database, if an event were to occur, it would be similar in size and magnitude to events within the surrounding County area. There were 57 hail events reported for Hays County since the year 1967.

Hailstorms: Extent and Probability

The Tornado and Storm Research Organization (TORRO) created a hail extent index to measure hail called the Hailstorm Intensity Scale. According to the reported previous hail occurrences for the planning area, the maximum hail extent experienced was up to 3 inches or 76.20 millimeters in diameter (corresponding to a TORRO Hailstorm Intensity Scale classification of a “Super Hailstorm”). Refer to Chapter 2, the risk assessment portion of the main plan document, for hail extent scale descriptions.

Based on 57 reported events in 49 years, a hail event occurs in Hays County approximately once a year, on average. Since hail events can happen anywhere throughout the HMP planning area, the City of Hays’ future probability is assumed to be similar to the surrounding County area. The City’s probability for a hail event is approximately once every year (on average) in the future with hail up to 3 in., or 76.20 mm. in diameter, corresponding to a TORRO Hailstorm Intensity Scale classification of a “Super Hailstorm.”

Hailstorms: Impact

Based on the maximum hail extent experienced in the surrounding County area (76.20 mm), the TORRO Hailstorm Intensity Scale (found in Chapter 2, the risk assessment portion of the main plan document) indicates that impact can be expected to include any of the following:

- Varying degrees of damage to vegetation and crops
- Damage to plastic structures
- Varying degrees of damage to glass
- Paint and wood scored
- Vehicle bodywork damage
- Varying degrees of roof damage
- Varying degrees of risk of injuries
- Varying degrees of aircraft damage
- Brick walls pitted
- Risk of severe or even fatal injuries to persons caught in the open

Hailstorms: Vulnerability Summary

Although undocumented and unavailable for data analysis purposes, community testimony indicates that there have been past hail events in the community that have affected vehicles and roofs. City Hall is a residential structure with a composite shingle roof that houses all city records. The roof and windows on this structure are susceptible to hail damage, and the city archive could experience water damage if hail caused severe damage to the structure.





Windstorms

Windstorms: Location

The entire extent of the City of Hays is exposed to some degree of wind hazard. Since wind can occur at any location, wind events could be experienced anywhere within the planning area.

Windstorms: Previous Occurrences

While the City of Hays has not had any previous occurrences reported through the NOAA Storm Events Database, if an event were to occur, it would be similar in size and magnitude to events within the surrounding County area. There were 38 wind events reported for Hays County and its unincorporated jurisdictions from year 1974.

Windstorms: Extent and Probability

Wind is measured by the Beaufort Wind Scale that relates wind speed to observed conditions on land and sea. According to the reported previous windstorm occurrences in the planning area, the maximum wind extent experienced was 70 knots (Beaufort Wind Scale Classification: Hurricane). Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of wind extent scales.

Based on 38 reported events in 42 years, a wind event occurs in Hays County approximately once every year, on average. Since wind events can happen anywhere throughout the HMP update area, the City of Hays' future probability is assumed to be similar to the surrounding County area. In the future, the City's probability for a wind event of up to 70 knots, or 80.55 miles per hour (Beaufort Wind Scale Classification: Hurricane) is approximately once every year (on average).

Windstorms: Impact

Data available from the Texas Department of Transportation's Crash Records Information System shows that between the years of 2010 and 2017, Rural Hays County experienced 5 crashes related to severe crosswind weather conditions. There were no injuries reported from these crash events. Since wind events occur on a regional scale, it is assumed that weather related crashes in the surrounding County area would be similar to those experienced in these conditions within the City of Hays.

Table HA.3, Windstorms, Vehicle Accidents, Hays County

City	Fatality	Incapacitating Injury	Non-Incapacitating Injury	Possible Injury	Crash Year	Street Name	Surface Condition	Weather Condition
Rural Hays County	0	0	0	0	2010	LIME KILN RD	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2017	US0290	Wet	Severe Crosswinds

(Texas Department of Transportation, 2017)





Structures can be damaged by flying debris and impact from winds damaging rooftops and causing other structural damage. Critical infrastructure, such as utility poles and street signals, could also be disrupted, impacting all residents in the affected area. Debris on the roadway can also cause obstruction for emergency responders' ability to provide services.

Windstorms: Vulnerability Summary

The City's past unofficial, undocumented damage, based on community testimony, indicates that the community is susceptible to falling trees, debris in the roadway and damage to storage buildings and barns. These structures are vulnerable to high winds due to the composition of the structure materials, free span roof architecture and lack of permanent foundation of the temporary structures. A majority of the City of Hays' power lines are on poles. During windstorm events, high winds cause damage to lines and interruptions to electrical service.

A community made up entirely of residential structures, the City of Hays has only 1 public facility (City Hall) that is not retrofitted to mitigate the damages of severe wind events. In addition, there are no back-up generators to provide continuity of operations for City Hall after a severe event. A lack of resources for electricity could lead to delays in getting assistance for members of the community.





Tornadoes

Tornadoes: Location

The entire extent of the City of Hays is exposed to some degree of tornado hazard. Since tornadoes can occur at any location, tornado events can be experienced anywhere within the planning area.

Tornadoes: Previous Occurrences

While the City of Hays has not had any previous occurrences reported through the NOAA Storm Events Database, if an event were to occur, the event would be similar in size and magnitude to events within the surrounding County area. Table HA.4 lists the 16 tornado events reported for Hays County and its unincorporated jurisdictions from year 1953.

Fatality, injury and damage amounts are shown in Table HA.4, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table HA.4, Tornado Events, Hays County

Location	Date	Type	Extent	Fatalities	Injuries	Property Damage	Crop Damage
Hays County	4/28/1953	Tornado	F3	1	5	250,000.00	0.00
Hays County	4/30/1954	Tornado	F1	0	0	250,000.00	0.00
Hays County	5/2/1958	Tornado	F1	0	0	30.00	0.00
Hays County	11/12/1961	Tornado	F2	0	0	2,500.00	0.00
Hays County	9/20/1967	Tornado	NA	0	0	250.00	0.00
Hays County	9/20/1967	Tornado	NA	0	0	30.00	0.00
Hays County	5/10/1975	Tornado	F1	0	0	25,000.00	0.00
Hays County	3/30/1976	Tornado	F2	0	0	25,000.00	0.00
Hays County	3/30/1976	Tornado	F2	0	1	250,000.00	0.00
Hays County	8/10/1980	Tornado	F2	0	0	25,000,000.00	0.00
Hays County	4/22/1985	Tornado	F2	0	0	250,000.00	0.00
Hays County	8/22/1991	Tornado	F1	0	0	2,500.00	0.00
Countywide	5/13/1994	Tornado	F0	0	0	500.00	500.00
Henly	11/15/2001	Tornado	F0	0	1	50,000.00	0.00
Driftwood	10/8/2002	Tornado	F0	0	0	70,000.00	0.00
M. Gainor	5/23/2015	Tornado	EF0	0	0	0.00	0.00
Total				1	7	\$26,175,810.00	\$500.00

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)

Tornadoes: Extent and Probability

Tornadoes are measured by severity on the Fujita and Enhanced Fujita Scale, with a range from 0-6. According to the reported previous tornado occurrences in the planning area, the maximum tornado extent experienced was a category F3. Refer to Chapter 2, the risk assessment portion of the main plan document for a description of tornado extent scales, Fujita (F) Scale and Operational Enhanced Fujita (EF) Scale.

Based on 16 reported events in 63 years, a tornado event occurs approximately every 4 years on average in Hays County. The City of Hays' future probability is assumed to be similar to the surrounding County area. The City's probability of a tornado event is approximately once every 4 years (on average) in the future, up to an F3 magnitude.





Tornadoes: Impact

There is no specific event data available for the City of Hays, from which impacts would be calculated. However, it can be assumed that impacts would be similar to those that the surrounding County area experiences.

Based on Hays County having experienced tornadoes between F0 and F3 levels in the past, if similar events were to happen in the future in the City, the type of impacts that the jurisdiction can expect associated with those magnitudes would include, from least to greatest:

- Light Damage - Broken branches; shallow rooted trees pushed over; some chimney damage.
- Moderate Damage - Surface damage to roofs; mobile homes pushed off foundation; moving vehicles pushed off the road.
- Significant Damage - Frame houses have roof torn off; mobile homes completely destroyed; train boxcars overturned; large trees snapped or uprooted; smaller debris turned into missiles.
- Severe Damage - Roofs completely torn off well-constructed buildings, along with some walls; majority of trees uprooted; trains overturned; vehicles lifted off the ground.

(Tornado Facts, 2016)

Critical infrastructure, such as utility poles and street signals, could also be disrupted, impacting all residents in the affected area. Debris on the roadway can also cause obstruction for emergency responders' ability to provide services.

Tornadoes: Vulnerability Summary

The City's past unofficial, undocumented damage, based on community testimony, indicates that the community is susceptible to falling trees, debris in the roadway and damage to storage buildings and barns with high winds. These structures are vulnerable to the impacts of the extreme winds that accompany tornado events due to the composition of the structure materials, free span roof architecture and lack of permanent foundation of the temporary structures. A majority of the City of Hays' power lines are on poles. A tornado event could cause damage to lines and interruptions to electrical service.

A community made up entirely of residential structures, the City of Hays has only 1 public facility (City Hall) that could only provide temporary shelter for a small number residents affected by tornado damage. In addition, there are no back-up generators to provide continuity of operations for City Hall after a tornado. The time period immediately following a disaster event is critical for local government resilience, as citizens count on the ability to provide help. A lack of resources for electricity for City Hall could lead to delays in getting assistance for members of the community.





Expansive Soils

Expansive Soils: Location

Figure 2.3 within Chapter 2 (the Risk Assessment portion within the Hays County HMP Update) shows the location of expansive soil areas for the City. The entire extent of the jurisdiction is classified as having less than 50 percent of the area underlain by soils with clays of high swelling potential, therefore all of the jurisdiction is equally at risk.

Expansive Soils: Previous Occurrences

There was no documentation of site-specific past events of structural damage due to expansive soils from local, State, or national datasets found.

Expansive soils cannot be documented as a time-specific event, except when leads to structural and infrastructure damage. There are no specific damage reports or historical records of events in the City, however future events can occur.

Expansive Soils: Extent and Probability

Considering the amount of swelling potential within the jurisdiction, as well as the lack of reported events, the probability of a future event is low (0 - 1 occurrences in the next 10 years affecting less than 5 structures).

Expansive Soils: Impact

Although there have been no reported impacts of expansive soils with the City of Hays, possible impacts could include foundation damage to residential structures, concrete damage to sidewalks, and yard damage. Any infrastructure resting upon soil could be at risk for damage as the soil expands and contracts. Increased severity in weather and natural conditions lead to increased soil swelling, resulting in deeper and longer cracks, and possible structural shifting.

Expansive Soils: Vulnerability Summary

The lack of impact at present time leads to lessened concern for the issue. The City of Hays is comprised of only residential structures, so future effects on home foundations can be expected if the expansive soils worsen. The 6 streets that make up the entire City are also susceptible to cracking, if uncommon expansive soil events were to occur.



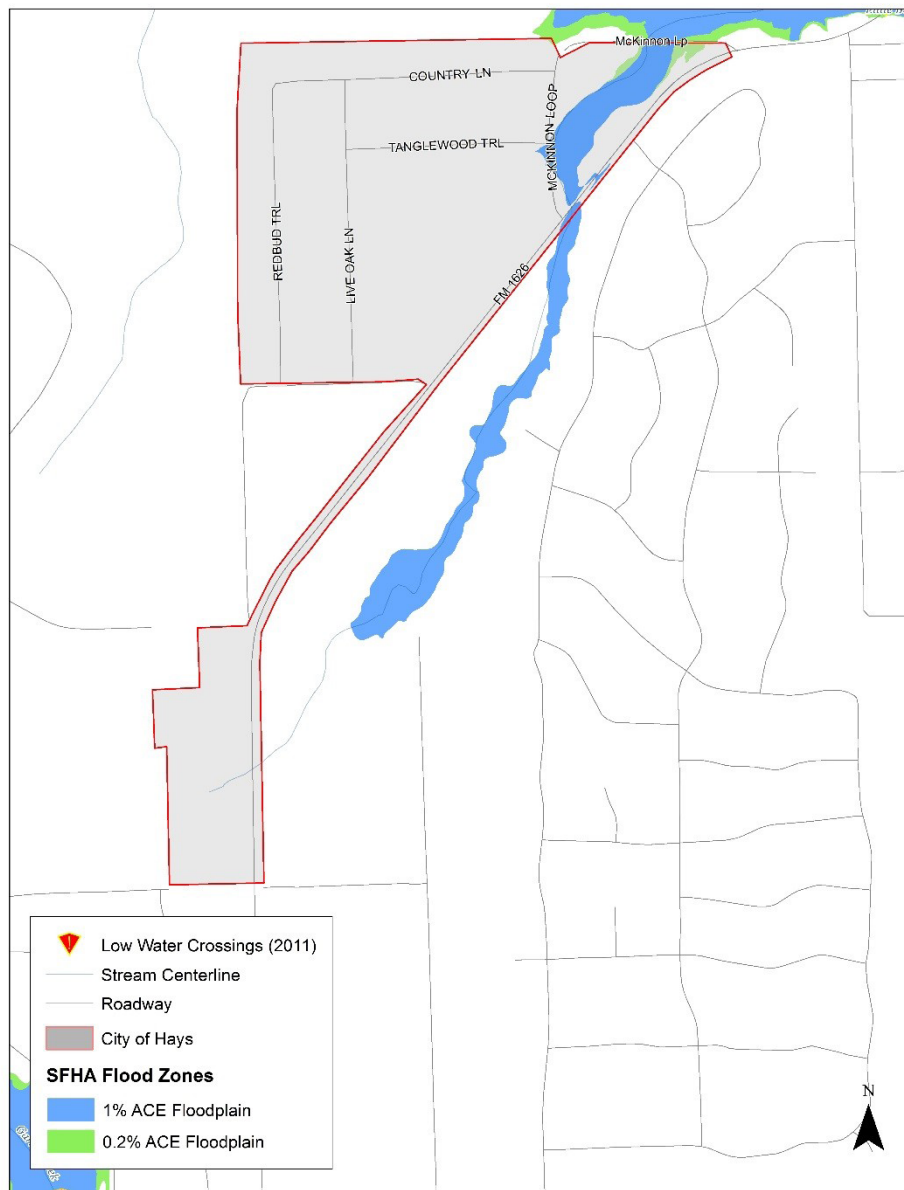


Floods

Floods: Location

The location of low water crossings, as well as the 1% (100 year) and 0.2% (500 year) Annual Chance Event (ACE) floodplains for the City of Hays are shown in Figure HA.3. This figure represents the locations within the planning area that are most affected by riverine flooding and is based upon newly developed hydrologic and hydraulic analysis. The new analysis is considered the best information available to date. Table HA.5 provides the total acreage in the jurisdiction that is located in the 1% and 0.2% floodplains.

Figure HA.3, Special Flood Hazard Areas, City of Hays



(Texas Natural Resources Information System, 2011)




Table HA.5, City of Hays Floodplain Acreage

Jurisdiction	100yr (1%) Floodplain Acres (Includes Floodway)	500yr (0.2%) Floodplain Acres (Includes 100yr)
City of Hays	6.02	6.77

Floods: Previous Occurrences

The County received 3 disaster declarations for flooding since October of 2013. Aside from the October 2015 event reported under the unincorporated jurisdiction of Driftwood, these events are not reflected in Table HA.6. Due to the nature of NOAA's reporting, the other events described below were reported under incorporated jurisdictions. These events did, however, substantially affect Hays County and its unincorporated areas. Narratives detailing these significant events are included below. Although there were no flood events reported specifically for the City of Hays in the NOAA Storm Events Database, Table HA.6 lists the 69 documented events reported for Hays County and its unincorporated jurisdictions from the years 1997 to 2016. Due to the size and extent of some flood occurrences as well as the regional or zonal nature of reports in the NOAA Storm Events Database, the City of Hays may have been affected by many of the events that were reported for the surrounding areas.

Fatality, injury and damage amounts are shown in Table HA.6, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table HA.6, Flood Events, Hays County

Location	Date	Type	Fatalities	Injuries	Property Damage	Crop Damage
Countywide	5/23/1997	Flash Flood	0	0	10,000.00	0.00
Countywide	6/6/1997	Flash Flood	0	0	10,000.00	0.00
Countywide	6/7/1997	Flash Flood	0	0	15,000.00	0.00
Countywide	6/8/1997	Flash Flood	2	7	2,500,000.00	50,000.00
Countywide	6/21/1997	Flash Flood	0	0	5,000.00	0.00
Countywide	6/22/1997	Flash Flood	0	0	50,000.00	50,000.00
Countywide	2/21/1998	Flash Flood	0	0	5,000.00	0.00
Countywide	7/3/1998	Flash Flood	0	0	20,000.00	0.00
Countywide	8/22/1998	Flash Flood	0	0	20,000.00	10,000.00
Countywide	8/23/1998	Flash Flood	0	0	10,000.00	0.00
Countywide	10/17/1998	Flash Flood	0	100	500,000.00	50,000.00
HAYS (ZONE)	10/17/1998	Flood	0	25	4,000,000.00	50,000.00
HAYS (ZONE)	10/17/1998	Flood	0	25	4,000,000.00	50,000.00
Countywide	6/21/1999	Flash Flood	0	0	3,000.00	0.00
Countywide	6/9/2000	Flash Flood	0	0	15,000.00	0.00
Countywide	11/2/2000	Flash Flood	0	0	20,000.00	0.00
HAYS (ZONE)	11/4/2000	Flood	0	0	0.00	0.00
North Portion	8/26/2001	Flash Flood	0	0	10,000.00	0.00
Countywide	8/31/2001	Flash Flood	0	0	20,000.00	0.00
Countywide	8/31/2001	Flash Flood	0	0	30,000.00	20,000.00
Countywide	11/15/2001	Flash Flood	0	20	200,000.00	50,000.00
HAYS (ZONE)	11/15/2001	Flood	0	0	0.00	0.00
West Portion	6/30/2002	Flash Flood	0	0	10,000.00	0.00



Table HA.6, Flood Events, Hays County, (cont.)

Location	Date	Type	Fatalities	Injuries	Property Damage	Crop Damage
HAYS (ZONE)	7/1/2002	Flood	0	0	0.00	0.00
South Portion	7/1/2002	Flash Flood	0	0	0.00	0.00
Countywide	7/2/2002	Flash Flood	0	0	0.00	0.00
West Portion	7/3/2002	Flash Flood	0	0	0.00	0.00
West Portion	7/5/2002	Flash Flood	0	0	0.00	0.00
South Portion	9/19/2002	Flash Flood	0	0	0.00	0.00
South Portion	10/24/2002	Flash Flood	0	0	0.00	0.00
Countywide	11/4/2002	Flash Flood	0	0	0.00	0.00
Countywide	2/20/2003	Flash Flood	0	0	10,000.00	0.00
West Portion	6/13/2003	Flash Flood	0	0	5,000.00	0.00
South Portion	9/11/2003	Flash Flood	0	0	3,000.00	0.00
Northwest Portion	1/16/2004	Flash Flood	0	0	3,000.00	0.00
East Portion	6/5/2004	Flash Flood	0	0	0.00	0.00
Countywide	6/9/2004	Flash Flood	0	0	350,000.00	0.00
Driftwood	6/26/2004	Flash Flood	0	0	0.00	0.00
West Portion	6/27/2004	Flash Flood	0	0	0.00	0.00
West Portion	6/28/2004	Flash Flood	0	0	0.00	0.00
Countywide	6/29/2004	Flash Flood	0	0	0.00	0.00
South Portion	6/30/2004	Flash Flood	0	0	0.00	0.00
Hays (Zone)	6/30/2004	Flood	0	0	0.00	0.00
West Portion	7/25/2004	Flash Flood	0	0	0.00	0.00
Countywide	10/2/2004	Flash Flood	0	0	0.00	0.00
Countywide	10/23/2004	Flash Flood	0	0	0.00	0.00
HAYS (ZONE)	10/23/2004	Flood	0	0	0.00	0.00
HAYS (ZONE)	10/24/2004	Flood	0	0	0.00	0.00
Countywide	11/16/2004	Flash Flood	0	0	0.00	0.00
HAYS (ZONE)	11/17/2004	Flood	0	0	0.00	0.00
Countywide	11/21/2004	Flash Flood	0	0	0.00	0.00
Countywide	11/22/2004	Flash Flood	0	0	0.00	0.00
Countywide	11/22/2004	Flash Flood	0	0	0.00	0.00
Southeast Portion	11/23/2004	Flash Flood	0	0	0.00	0.00
South Portion	5/6/2006	Flash Flood	0	0	0.00	0.00
Henly	3/30/2007	Flash Flood	0	0	0.00	0.00
Driftwood	3/30/2007	Flood	0	0	0.00	0.00
Henly	5/2/2007	Flash Flood	0	0	0.00	0.00
Henly	7/2/2007	Flash Flood	0	0	0.00	0.00
Henly	5/17/2010	Flash Flood	0	0	0.00	0.00
Driftwood	9/7/2010	Flash Flood	0	0	0.00	0.00
Driftwood	5/10/2012	Flash Flood	0	0	0.00	0.00
Driftwood	5/11/2012	Flash Flood	0	0	0.00	0.00
Fitzhugh	5/17/2015	Flash Flood	0	0	0.00	0.00
Henly	5/30/2015	Flash Flood	0	0	0.00	0.00
Fitzhugh	6/14/2015	Flash Flood	0	0	0.00	0.00
Driftwood	10/30/2015	Flash Flood	0	0	10,000,000.00	0.00



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Table HA.6, Flood Events, Hays County, (cont.)

Location	Date	Type	Fatalities	Injuries	Property Damage	Crop Damage
Fitzhugh	5/19/2016	Flash Flood	0	0	0.00	0.00
Driftwood	8/16/2016	Flash Flood	0	0	0.00	0.00
Totals			2	177	\$21,824,000.00	\$330,000.00

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)

Floods: Significant Past Events



Although there were no flood events reported specifically for the City of Hays in the NOAA Storm Events Database, due to the size and extent of some flood occurrences as well as the regional or zonal nature of reports in the NOAA Storm Events Database, the City may have been affected by many of the events that were reported for the surrounding areas. Refer to the Significant Past Events within the Hays County Annex for narratives discussing these events.

Floods: Extent

Flood extent is described through a combination of ground elevation, river heights, 100-year Water Surface Elevations (WSE's) and HAZUS depth grids. Little Bear Creek, located approximately 400 feet north of the City of Hays, has an approximate normal in-channel elevation of 683 feet (per LiDAR and USGS data) and an intersecting 100-year WSE of approximately of 690 feet. Here, flood depths would be 7 feet.

Floods: Probability

Probability has been calculated on the basis of NOAA reported events, as a standard, consistent calculation method for all hazards profiled with the Hays County HMP. Based on 69 reported events in 19 years, a flood event occurs approximately 3 to 4 times per year on average in Hays County and its unincorporated jurisdictions. Due to the size and extent of some flood occurrences, as well as the regional or zonal nature of reports in the NOAA Storm Events Database, the City of Hays' future probability is assumed to be similar to the surrounding County area. The City can expect a flood event approximately 3 to 4 times per year (on average) in the future, up to 7 feet in depth.

Floods: Impact

The following describes the inventory counts and building replacement values for the jurisdictional area.

City of Hays Building Counts			
Residential	Commercial	Other	Total
83	5	0	88

City of Hays Building Replacement Value		
Building (\$)	Content (\$)	Total (\$)
38,567,392	19,993,430	58,560,822





A Probabilistic 100-year Return Period HAZUS-MH 3.2 analysis was run on the City of Hays. HAZUS results are calculated to census blocks. This analysis utilized the best available LiDAR (COA 2012 and CAPCOG 2008) and Depth Grids. These blocks were then intersected with the City of Hays to run a weighted area analysis to get jurisdictional results. The following paragraphs describe results of the 100-year Return (1% Annual Chance Event) weighted area analysis.

HAZUS-MH Results

General Building Stock Damage

HAZUS estimates that 1 building will be at least moderately damaged in the City of Hays. “At least moderately damaged” is defined by HAZUS as greater than 10% damage to a building.

Residential Buildings	Commercial Buildings	Other Buildings	Total Buildings
1	0	0	1

Building-Related Losses

Exposed Value is the total building and content values for structures within the community. The exposed value for the community is \$58,560,822. The total building-related losses were \$255,417 for this scenario. This represents 0.4% of the total replacement value of the community. Loss values are divided into building and content loss dollars.

Building Loss (\$)	Content Loss (\$)	Total Loss (\$)
162,515	92,903	255,417

Essential Facility Damage

HAZUS does not estimate any critical facilities or infrastructure interruption to be for more than 1 day. The model estimates that 100% of community hospital beds would be available for use by patients already in the hospital and for those injured by an event.

Debris Generation

HAZUS estimates the amount of debris that will be generated in this scenario. The model estimates that a total of 11 tons of debris will be generated. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckload (with 1 to 25 tons per truck) to remove the building debris generated in this scenario.

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS also estimates the number of people displaced that will require accommodations in temporary public shelters. The model estimates 7 people will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 1 person will seek temporary shelter in public shelters.



Hays County Hazard Mitigation Plan, City of Hays Annex

Floods Vulnerability Summary

The entire community of the City of Hays is considered Pre-FIRM, meaning that all structures were constructed before the adoption of the FEMA Flood Insurance Rate Maps, and before participating in the National Flood Insurance Program. This means that structures were not constructed to minimum flood damage prevention standards, because the standards had not been adopted at the time of construction. Those residing in these homes are vulnerable, as their level of risk is unknown.

National Flood Insurance Program Repetitive Loss (RL)

The City of Hays is a current participant in the National Flood Insurance Program (NFIP). As of September of 2016, the City does not have any listed Repetitive Loss (RL) or Severe Repetitive Loss (SRL) properties according to FEMA RL/SRL data.



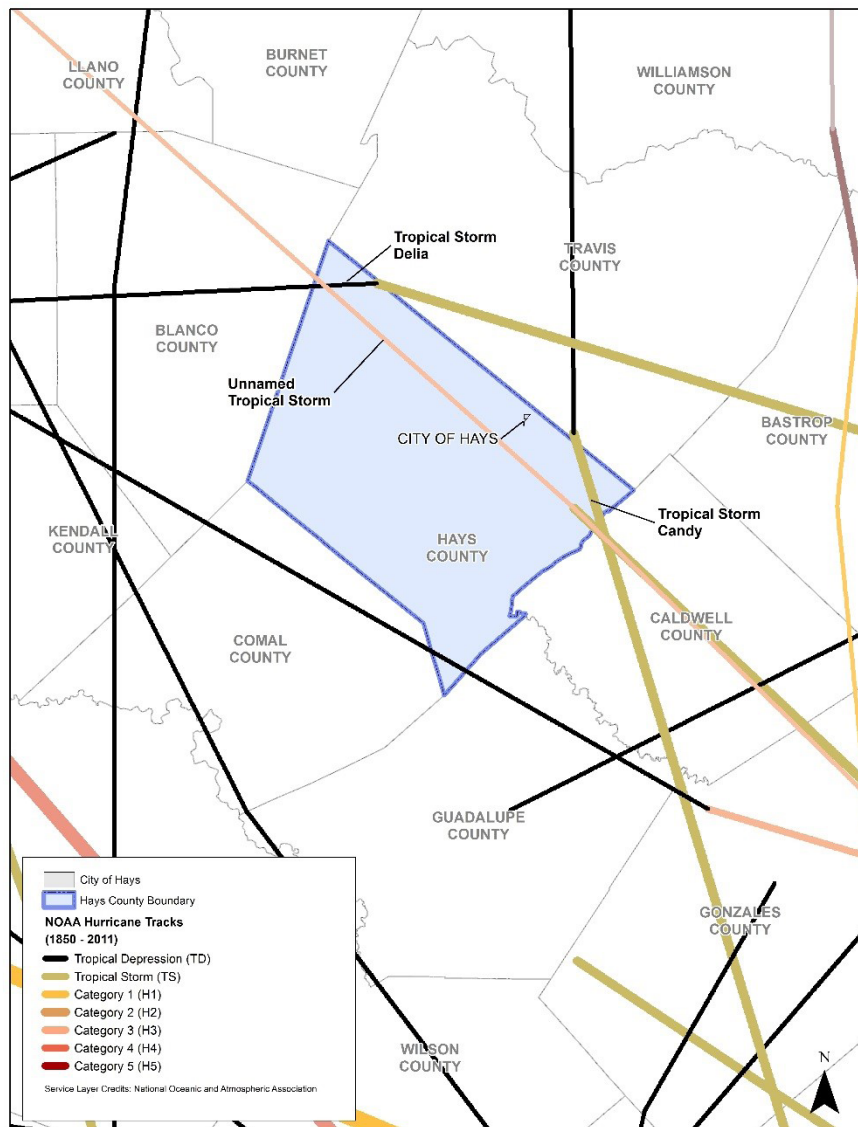


Hurricanes/Tropical Storms

Hurricanes/Tropical Storms: Location

Due to the regional nature of a hurricane or tropical storm event, the entire extent of the City of Hays is equally exposed to a hurricane or tropical storm. Figure HA.4 illustrates the location of the planning area with historical hurricane and tropical storm paths documented by NOAA's Hurricane Tracker from 1850 to 2011.

Figure HA.4, Historical Hurricane/Tropical Storm Paths, City of Hays



(National Oceanic and Atmospheric Administration, 2016)



Hurricanes/Tropical Storms: Previous Occurrences

Previous events are described below based on the NOAA Storm Events Database for Tropical Storm Hermine and NOAA Hurricane Tracker for all other events. By the time most hurricanes reach the County, they are tropical storms, depressions or thunderstorms. Because hurricane and tropical storm events occur on a regional scale, all events listed for Hays County have been included as they would impact the

Hays County Hazard Mitigation Plan, City of Hays Annex



City of Hays.

July 13 to July 22, 1909 – An unnamed storm made landfall near Freeport, as a Category 3 Hurricane. This storm impacted Hays County and participating communities as a tropical depression with wind speeds up to 30 knots. No significant damages, injuries, or fatalities were reported for the City.

June 22 to June 26, 1968 – Tropical Storm Candy made landfall near Port Aransas. This storm impacted Hays County and participating communities as a tropical storm with wind speeds slowing to 30 knots as a tropical depression just after leaving the

County. No significant damages, injuries, or fatalities were reported for the jurisdiction.

September 1 to September 7, 1973 – Tropical Storm Delia made landfall near the border of Brazoria and Matagorda Counties. This storm impacted Hays County and participating communities as a tropical storm with wind speeds slowing to 30 knots as a tropical depression just after leaving the County. No significant damages, injuries, or fatalities were reported for the jurisdiction.

September 6 to September 8, 2010 – According to the NOAA Storm Events Database, Tropical Storm Hermine made landfall near the Texas/Mexico border on the night of September 6. South Central Texas was hit very hard with widespread rains of 8 to 12 inches across much of the IH-35 corridor from Austin down to San Antonio.

Hurricanes/Tropical Storms: Extent and Probability

The Saffir-Simpson Scale measures pressure, wind speed, and storm surge in 5 categories. According to the reported previous hurricane occurrences in the jurisdiction, the maximum hurricane extent experienced was categorized as a Tropical Storm. Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of storm extents.

Based on 4 reported events in 107 years, a hurricane or tropical storm event occurs approximately every 27 years on average in Hays County. Since hurricane and tropical storm events can happen anywhere throughout the HMP update area, the City of Hays' future probability is assumed to be similar to the surrounding County area. In the future, the City can expect an event approximately once every 27 years on average, of up to a magnitude of a tropical storm at a 100-year Max Wind Speed of 70 mph based on historical extents and HAZUS analysis.

Hurricanes/Tropical Storms: Impact

A Probabilistic 100-year Return Period HAZUS-MH 3.2 analysis was run on the City of Hays. The following paragraphs describe the results of this analysis.

HAZUS-MH Results

General Building Stock Damage

The total property damage losses were \$9,136. The majority of damage can be expected to impact residential areas (98%). The remaining damages (2%) are for commercial, industrial, agriculture and religious buildings. While some building damage is experienced, it is estimated that no buildings will be completely destroyed or experience severe damage. Exposed Value is the total building and content value (\$) for structures within the community. Loss values are divided separately for building and content loss in dollars.

Exposed Value (\$) (Building + Content)	Building Loss (\$)	Content Loss (\$)	Total Loss (\$)
58,560,822	9,136	0	9,136





Essential Facility Damage

HAZUS does not estimate any critical facilities or infrastructure to be interrupted for more than 1 day. The model estimates that 100% of available hospital beds would be available for use by patients already in the hospital and for those injured by the hurricane.

Debris Generation

HAZUS estimates the amount of debris that will be generated by the hurricane at a total of 1 ton. Of the total amount, Brick/Wood comprises 100% of the total. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckload (with 1 to 25 tons per truck) to remove the building debris generated by the hurricane.

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of people displaced that will require accommodations in temporary public shelters. The model estimates no households to be displaced due to the hurricane. Therefore no temporary shelter is needed.

Hurricanes/Tropical Storms: Vulnerability Summary

Similar to the impacts of windstorms, hailstorms, and lightning, City of Hays can expect to be impacted with debris and possible interruptions of critical infrastructure if the event is a stronger magnitude than those previously experienced by the City. In addition, the community's proximity to IH-35 could lead to traffic delays caused by major evacuation efforts, if the highway is used as an evacuation route for coastal residents.





Earthquakes

Earthquakes: Location

Locations within proximity to fault lines are typically the areas most at risk for earthquakes. Figure HA.5 shows USGS documented fault lines and the locations of earthquakes from 1847 to 2015 in relation to the City of Hays.

Figure HA.5, Texas Earthquakes, 1847 – 2015, City of Hays



(USGS Earthquake Hazard Program, 2015)

Earthquakes: Previous Occurrences

According to USGS 1847-2015 data, there have been no documented earthquake events for the City of Hays as illustrated in Figure HA.5.





Earthquakes: Extent and Probability

Earthquakes are measured by Peak Ground Acceleration (PGA). The HAZUS PGA for the planning area is 1.57% (see City of Hays Earthquakes: Impact Section for a description of the HAZUS Analysis). This corresponds to the Modified Mercalli Scale Category IV, with light perceived shaking and no potential structure damage. HAZUS measures PGA on a census tract level. Cities within more than 1 census tract were assigned the highest PGA level to reflect the maximum possible extent. Refer to Chapter 2 for extent scale descriptions (the risk assessment portion of the main

plan document).

As there have been no recorded previous occurrences of earthquakes for the City of Hays and the PGA is less than 2% for the area, the probability of an earthquake in the City in the future is low (0 - 1 occurrences in the next 10 years at up to a 500-year PGA of 1.57%).

Earthquakes: Impact

The FEMA How-To Guidance, Understanding Your Risks (FEMA 386-2, page 1-7), suggests the earthquake hazard should be profiled if the PGA is greater than 3%g, where PGA is measured in the acceleration of gravity (g). The City's PGA is less than 3%g (0.03) and there have been no recorded earthquakes in or near the jurisdiction. Therefore, only a minimum level-1 HAZUS analysis was profiled using the 500-year probability event scenario. The HAZUS analysis produced a PGA of 1.57%. The HAZUS scenario would produce \$0 in building damages (Residential, Commercial, Agriculture, Religious and Government) from an event. Critical facilities and Infrastructure would not experience any loss of service. There would be no critical facilities or infrastructure would experienced moderate to complete damage. No debris would be generated from this event and no people or households would require temporary housing. There would be no moderate, extensive or completely damaged buildings by this event. HAZUS estimates no residents are expected to be displaced from their homes or will require accommodations in temporary public shelters due to the simulated earthquake. Additionally, there would be no casualties or fatalities from this event.

Earthquakes: Vulnerability Summary

While the probability of an earthquake in the City is low, with no significant prior events on file, there is a fault line located within the jurisdiction according to USGS data. This could cause impact if there were to be an increase in seismic activity. The City of Hays could expect to be impacted with debris and possible utility interruptions during an unlikely and unprecedented event that exceeds the 500 -year probability event scenario run in HAZUS. If an event of this magnitude were to incapacitate a roadway, emergency responders would be hindered from responding, leaving residents at risk.

The following local roadways are crossed by the USGS fault lines displayed on Figure HA.5: McKinnon Loop, Country Lane, Live Oak Lane, and Redbud Trail.



Page 22, Dam/Levee Failure have been redacted from this copy of the plan.



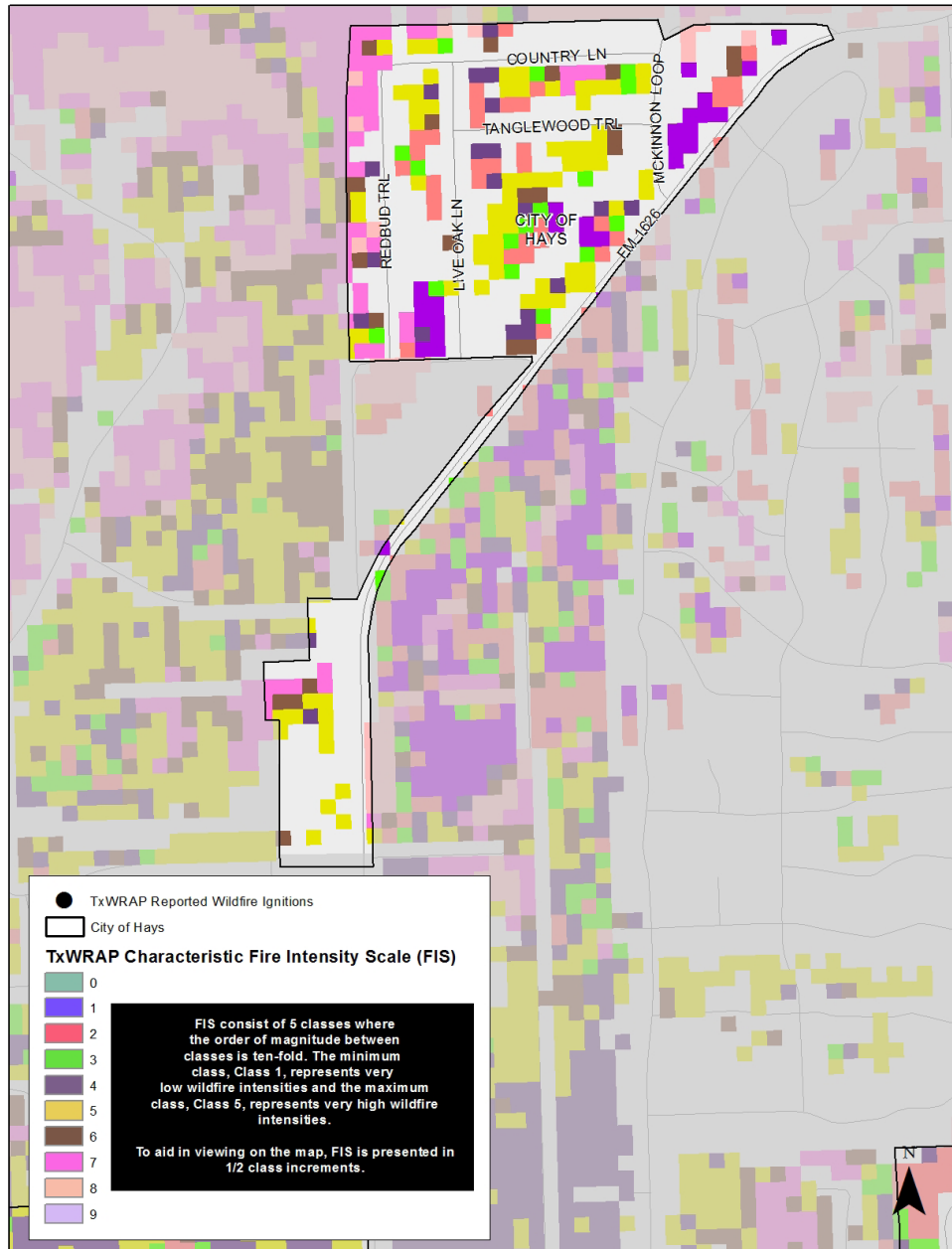


Wildfires

Wildfires: Location

The Texas A&M Forest Service's Texas Wildfire Risk Assessment Portal (TxWRAP) can be used to help communities understand their wildfire risk. Figure HA.6 below shows the location of TxWRAP's documented wildfire occurrences with Fire Intensity Scale (FIS) classifications within the City of Hays. TxWRAP identifies FIS areas as those where wildfire fuels and associated potential dangerous fire behavior exist, based on a weighted average of 4 percentile weather categories.

Figure HA.6, Fire Intensity Scale (FIS), City of Hays



(Texas A&M Forest Service, 2016)





Wildfires Previous Occurrences

There were no reported wildfire ignitions within the City of Hays, according to TxWRAP and USGS Federal Fire Occurrence data from the years 1980 to 2015.

Wildfires: Extent and Probability

Table HA.7 lists the Fire Intensity Acreage for the City, according to the Texas A&M Forest Service TxWRAP Community Summary Report. For a description of the FIS, refer to Chapter 2, the risk assessment portion of the main plan document.

Table HA.7, TxWRAP Fire Intensity Acreage, City of Hays

Class	Acres	Percent
Non-Burnable	80	59.60%
1 (Very Low)	7	5.50%
1.5	10	7.30%
2 (Low)	3	2.50%
2.5	0	0.20%
3 (Moderate)	17	12.70%
3.5	4	2.60%
4 (High)	8	6.10%
4.5	5	3.50%
5 (Very High)	0	0.00%
Total	134	100.00%

There were no reported ignitions from TxWRAP and USGS Federal Fire Occurrence data in 35 years for the City of Hays. However, a wildfire can be ignited from a variety of sources including lightning or by human activity such as campfires, smoking, arson, or equipment use. When considering the lack of reported previous events for the City of Hays, a wildfire event in the future is moderate, 1-10 occurrences in the next 10 years with up to a potential fire intensity of 4.5, or “High” classification on the TxWRAP Characteristic FIS.

Wildfires: Impact

Impact on the community can be measured using TxWRAP Housing Density levels within the WUI. Areas with a higher housing and population density would be affected to a greater extent than more rural areas, and especially areas near burnable fuels. In the event of a wildfire in high density areas of population, residential structures would be damaged or destroyed, critical infrastructure such as water, sewer and electrical services would be damaged and interrupted and residents would experience injury or loss of life. Table HA.8 lists the population, percent of total population, WUI acreage and percent of WUI acreage



Table HA.8, WUI Acreage, City of Hays

Housing Density	WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
LT 1hs/40ac	5	1.4 %	3	2.0 %
1hs/40ac to 1hs/20ac	0	0.0 %	5	3.5 %
1hs/20ac to 1hs/10ac	0	0.0 %	6	4.5 %
1hs/10ac to 1hs/5ac	0	0.0 %	4	3.1 %
1hs/5ac to 1hs/2ac	3	0.8 %	10	7.5 %
1hs/2ac to 3hs/1ac	345	97.7 %	107	79.5 %
GT 3hs/1ac	0	0.0 %	0	0.0 %
Total	353	100.0 %	134	100.0 %



for the City of Hays, according to the Texas A&M Forest Service TxWRAP Community Summary Report.

Wildfires: Vulnerability Summary

The City of Hays is a community known for its mature trees and abundance of natural vegetation. The presence of brush and growth can serve as fuel for wildfire and put many of the 90 residential structures that exist within the WUI at risk.

While the community does have fire hydrants present for firefighting purposes, the community is supported by an Emergency Services District that serves various communities within its assigned boundaries. Response time is fast, averaging at 4 minutes, however in the occasion of widespread fires, that time may differ.



2.2 Risk Ranking Result

On January 12, 2017, members of the City of Hays MPC completed a questionnaire as part of the Hays County Hazard Mitigation Plan Update: Risk Assessment. The questions covered the risk associated with the hazards that affect each community based on the level of concern over each profiled hazard, the hazards' impact on health & safety, as well as impact to property and business continuity. The answers from this questionnaire were combined with public survey results on perception of risk. The values from both sources were analyzed using the Halff Risk Ranking Tool (details regarding the risk ranking tool are in Chapter 2, the risk assessment portion of the main plan document). The results provided a quantified ranking of risk, with values ranging from 0 to 100. The results for the City are shown below (hazard values shown from highest risk to lowest):

Ranking Order	Hazard	Risk Ranking Value
1	Floods	96.3
2	Wildfire	94.1
3	Lightning	94.1 (Exact Same Value as Wildfire)
4	Extreme Heat	92.2
5	Wind Storms	91.0
6	Drought	90.4
7	Hail Storms	70.4
8	Tornadoes	69.6
9	Severe Winter Storms	69.4
10	Expansive Soils	62.7
11	Earthquakes	40.0
12	Hurricanes/Tropical Storms	37.5
-	Dam/Levee Failure	Not Profiled
-	Land Subsidence	Not Profiled



Section 3: Mitigation Strategy

This section examines the community's ability to perform mitigation (a review of existing capabilities, is shown in Table HA.9) and identifies specific mitigation actions to address vulnerabilities for each hazard profiled in the Hays County HMP Update. The mitigation strategy is the application of actions into an approach for performing structural and non-structural mitigation efforts within the jurisdiction. Actions are also prioritized and considered for incorporation into other community programs, regulations, projects or plans.

Completed and canceled actions are also included in a separate section for future reference.

3.1 Existing Capabilities

Table HA.9, Existing Capabilities

Capability Name	Capability Type	Ability to Expand/Improve
Mayor/Emergency Management Coordinator	Elected Official	Political support and funding for mitigation actions./ Management of City-level HMP updates. Could attend mitigation information session to learn about community risks and mitigation strategy.
City Secretary	City Staff	Support for implementation of mitigation actions. Include as member or stakeholder for MPC.
Engineer/Floodplain Administrator	Staff - Consultant	Expertise in structural mitigation projects and compliance with flood damage prevention ordinance./Responsibility for continued participation in the NFIP. Attend advanced floodplain management training.
Sales Tax	Funding	Can be leveraged as potential funding for Hazard Mitigation items.
Property Tax		
Permitting and Licensing Fees		
Chapter 211 of the Local Government Code: Zoning	Authority	State level code that authorizes the City to regulate zoning. (State of Texas, 1987)
Chapter 213 of the Local Government Code: Municipal Comprehensive Plans		State level code that authorizes the City to adopt a comprehensive plan for the long-range development of the City. (State of Texas, 1997)
Chapter 214 of the Local Government Code		State level code that authorizes the City to have regulatory authority as it related to building code. (such as structural integrity and plumbing) (State of Texas , 1995)
City of Hays Municipal Code	Regulations	Code of ordinances that City of Hays uses to enforce control for safe development and a good environment for residents. Can be enhanced to enhance mitigation through higher standards in building that decrease risk and increase resiliency.



3.2 National Flood Insurance Program Participation

The City of Hays currently participates in the National Flood Insurance Program. Currently, there are no Certified Floodplain Managers on staff, due to a lack of resources. Their flood damage prevention ordinance names the City Secretary as the Floodplain Administrator. The amount of mapped floodplain in the City of Hays is very small. The City has adopted NFIP's minimum standards in their ordinance. As the community is nearly fully developed, there are not many permits for development being submitted for approval. The City will continue to explore options for higher standards and also consider application to the Community Rating System. The City of Hays has a total of 3 NFIP policies in force, as of June 2016. This totals \$735,000.00 in insurance coverage.

3.3 Mitigation Goals

The plan-level Mitigation Goals can be found in Chapter 3: The Mitigation Strategy portion of the Hays County Hazard Mitigation Plan. These mitigation goals apply to each community and were mutually decided upon as the guiding goals for the development of actions in each planning area.



3.4 Mitigation Actions

*E= Actions reducing risk to existing buildings and infrastructure

*F= Actions reducing risk to new development and redevelopment

Number/Title	Hazard	Item Description	Implementation Agency	
1 Attend Certified Floodplain Management Training (previously action 3 in 2011 plan)	Flood	Attend FEMA based training for floodplain management administration.	City of Hays City Hall	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Less than \$100 for local training registration, fuel		3 months	In progress	E/F
Cost and Benefit Considerations				
This low cost project for training will allow the City officials to continue to adhere to the standards adopted by the floodplain damage prevention ordinance and in turn ensure that structures are built or repaired within Federal minimum standards. This would benefit all citizens near and in the floodplain.				

Number/Title	Hazard	Item Description		Implementation Agency	
2 Improve Emergency Communication Capabilities through Installation of Weather Radio in City Hall (previously action 4 in 2011 plan)	Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Floods, Hurricanes/ Tropical Storms, Earthquakes, Wildfires	Installation of permanent weather radio system and weather station at City Hall with back-up power source.		City of Hays City Hall	
Cost Estimate/Funding			Schedule	Status as of 2017	*Risk Focus:
\$500/General Fund			6 months	In progress	N/A
Cost and Benefit Considerations					
This low-cost system would allow for quick and reliable warning information, outside of standard television, radio and cell phone sources. This would benefit all citizens in the community.					

Number/Title	Hazard	Item Description	Implementation Agency	
3 Storm Ready Designation for Community (previously action 6 in 2011 plan, modified)	Flood, Tornadoes, Windstorm, Hurricanes/ Tropical Storms, Hailstorms	Applying for National Weather Service as a community that has taken preparedness actions to ensure the community is able to receive emergency notifications.	City of Hays City Hall	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff resources/ in-kind services		9 months	Not started	N/A
Cost and Benefit Considerations				
This free application would lead to the increase of communication from officials to citizens and local government during times of disaster. This would benefit every member of the community in City of Hays.				



Hays County Hazard Mitigation Plan, City of Hays Annex

Number/Title	Hazard	Item Description	Implementation Agency	
4 Cooling Plan for Reducing the Impacts of Extreme Heat to Vulnerable Populations (previously action 7 in 2011 plan, modified)	Extreme Heat	Developing plans for providing a cool location for vulnerable populations to seek cool conditions during times of extreme heat.	City of Hays City Hall	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff resources/ in-kind services		9 months	Not started	N/A
Cost and Benefit Considerations				
Creation of this type of plan would benefit not only vulnerable populations, but also any other population that becomes vulnerable during circumstances that accompany extreme heat, such as power outage. This would be a low cost project that would benefit many.				

Number/Title	Hazard	Item Description	Implementation Agency	
5 Promote Flood Insurance (previously action 8 in 2011 plan, modified)	Flood	Using FEMA resources that are available for free for promoting flood insurance through National Flood Insurance Program pamphlets placed in City Hall.	City of Hays City Hall	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff resources/ in-kind services		3 months	Not started	N/A
Cost and Benefit Considerations				
By enhancing existing verbal campaign of promoting flood insurance, the use of free FEMA resources for informing all citizens of the existence of flood insurance benefits for those in and out of the Special Flood Hazard Area. This would cost nothing but the time it takes to order the resources and place them in City Hall. This would also mitigate the flooding that could result from a dam/levee failure.				

Number/Title	Hazard	Item Description	Implementation Agency	
6 Public Information Campaign on Natural Hazards (previously action 9 in 2011 plan, modified)	Drought, Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Expansive Soils, Floods, Hurricanes/Tropical Storms, Earthquakes, Wildfires	Creating resource page on City of Hays website to promote information about the hazards that exist in the community and how to take mitigation actions at the individual level.	City of Hays City Hall	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff resources/ in-kind services		6 months	In progress	N/A
Cost and Benefit Considerations				
This free enhancement to the City's existing website would benefit all with internet access at little to know cost, except the staff resources required to do so.				



Hays County Hazard Mitigation Plan, City of Hays Annex



Number/Title	Hazard	Item Description	Implementation Agency	
7 Annual Brush Clean-up Event Marketing (previously action 10 in 2011 plan, modified)	Wildfires, Severe Winter Storms, Lightning	Cross marketing of existing brush collection efforts from Texas Disposal Systems in order to promote mitigation.	City of Hays City Hall	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff resources/ in-kind services		3 months	Not Started	N/A
Cost and Benefit Considerations				
At only the cost of the staff for coordination, the community cross-marketing existing resources for collecting/ accepting brush in order to promote cleaning brush and dead trees in order to decrease fuel for wildfire, potential debris that could fall on power lines during freezing conditions and that could ignite during lightning strike. This would benefit any citizen that resides in a location with vegetation and trees.				

Number/Title	Hazard	Item Description	Implementation Agency	
8 Adding Water Conservation to Ordinances/institution of Drought Contingency Plan as part of operations (previous action 11 in 2011 plan, modified)	Drought	Adding drought conservation levels to ordinance to increase resiliency to drought conditions and also provide a method for monitoring drought trends on a local, regional and State level.	City of Hays City Hall	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff resources/ in-kind services		6 months	Not started	E/F
Cost and Benefit Considerations				
With the sole cost of writing and adopting new ordinance language and publication of the Drought Monitor on the website, all citizens in the City of Hays would benefit from actions that would reduce the impact of drought.				

Number/Title	Hazard	Item Description	Implementation Agency	
9 Rain Harvesting Information Promotion (previously action 12 in 2011 plan, modified)	Drought	Creating and distributing information sheets to public that encourage and provide guidance on how to build rain water harvesting systems on their home structures.	City of Hays City Hall	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff resources/ in-kind services, possible volunteer hours		6 months	In progress	N/A
Cost and Benefit Considerations				
This free creation of a resources sheet for citizens to get the information that would encourage them to harvest a secondary source of water to serve as back-up during periods of drought. This project could benefit all citizens within the community who do not already harvest rain.				

Hays County Hazard Mitigation Plan, City of Hays Annex

Number/Title	Hazard	Item Description	Implementation Agency	
10 Energy Prioritization Collaboration with Pedernales Electric Cooperative (previously 13 in 2011 plan, modified)	Extreme Heat, Severe Winter Storms, Lightning, Windstorms, Tornadoes, Hurricanes/ Tropical Storms	Working with PEC to create a citizen registration system for requesting prioritization for power restoration according to special need or circumstance during hazards that could affect access to electricity.	City of Hays City Hall	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff resources/ in-kind services		6 months	Not started	N/A
Cost and Benefit Considerations				
This low cost project for prioritizing energy restoration for those with special needs within the community that would be impacted by hazards that are known for affecting impact to electrical power. All those with special needs from electrical resources would benefit.				

Number/Title	Hazard	Item Description	Implementation Agency	
11 Sanding Plans for Roads (previously action 14 in 2011 plan, modified)	Severe Winter Storms	The establishment of preparatory plans and publication of agreements for private sanding of roads in order to protect citizens and maintain access to emergency responders.	City of Hays City Hall	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff resources/ in-kind services		6 months	Not started	N/A
Cost and Benefit Considerations				
This low cost project for making agreements and pre-set rates for sanding services for roads that are critical for entering the City of Hays to maintain the ability of first responders to be able to access all citizens from the community.				

Number/Title	Hazard	Item Description	Implementation Agency	
12 Floodplain/Floodway Audit (previously action 18 in 2011 plan, modified)	Flood	Quarterly efforts to ensure that unauthorized encroachments, such as private dams, are not allowed in the floodway.	City of Hays City Hall	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff resources/ in-kind services		9 months	Not started	E
Cost and Benefit Considerations				
For the cost of writing a procedure and doing quarterly audits, the community can ensure that all citizens downstream of the floodplain are further protected from the instability of possible private dams and encroachments.				



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Number/Title	Hazard	Item Description	Implementation Agency	
13 Creation of Community Evacuation Plans (previously action 19 in 2011 plan, modified)	Flood, Wildfires	Create evacuation plans for quick exit from the community.	City of Hays City Hall	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff resources/ in-kind services		9 months	Not started	N/A
Cost and Benefit Considerations				
This would be a low cost project for establishing evacuation route procedures and possible coordination with County level government that would benefit all citizens that would need to get out of the City of Hays during a disaster event that would affect their safety.				

Number/Title	Hazard	Item Description	Implementation Agency	
14 Adoption of Soil Compaction Standards for Road Construction	Expansive Soils	Adopting procedures to mitigate against expansive soils when constructing future roads within the community through higher level of soil compaction.	City of Hays City Hall	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Road project funding/ in-kind services		9 months	Not started	N/A
Cost and Benefit Considerations				
This would be a low cost project for building more resilient roads.				




3.5 Capabilities Assessment

Evaluation/Prioritization of Actions

Each action added to the plan was developed using the Mitigation Action Summary Worksheet shown in Figure HA.7. The cost/benefit calculation occurred on this document.

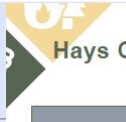
Figure HA.7, Mitigation Action Summary Worksheet



Hays County Hazard Mitigation Plan Update Process
Mitigation Action Summary Worksheet

Community Name:

Person completing questionnaire:



Hays County Hazard Mitigation Plan Update Process
Mitigation Action Summary Worksheet

Mitigation Action/ Project Title	
Background/ Issue	
Opportunities for Integration	
Responsible Agency	
Partners	
Strategy for Existing Structures	

Strategy for Future Development	
Potential Funding	
Cost Estimate (Values from "Measuring Costs" fields from Benefit and Cost Review Worksheet)	
Benefits (Statements from the "Difference" fields on the Benefit and Cost Review Worksheet)	
Timeline	
Priority (Based off Priority worksheet)	



Table HA.10, Mitigation Action Prioritization Tool, City of Hays

Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community	Risk Ranking Score	Total Score
1. Attend Certified Floodplain Management Training	1	1	1	1	0	0	1	1	0	1	96	103
6. Public Information Campaign on Natural Hazards	1	1	1	1	0	0	1	1	0	1	96	103
12. Floodplain/Floodway Audit	1	1	1	1	-1	1	1	1	0	1	96	103
13. Creation of Community Evacuation Plans	1	0	1	1	1	0	1	1	0	1	96	103
7. Annual Brush Clean-up Event Marketing	1	1	1	1	0	1	1	1	0	1	94	102
2. Improve Emergency Communication Capabilities through Social Media and Calling Tree Capabilities	1	0	0	1	0	0	1	1	0	1	96	101
3. Storm Ready Designation for Community	1	0	1	1	0	0	1	-1	0	1	96	100
5. Promote Flood Insurance	0	1	1	0	0	0	0	1	0	1	96	100
10. Energy Prioritization Collaboration with Pedernales Electric Cooperative	1	0	0	1	-1	0	1	1	1	1	94	99
9. Rain Harvesting Information Promotion	1	1	1	0	0	1	1	1	1	1	90	98
4. Cooling Plan for Reducing the Impacts of Extreme Heat to Vulnerable Populations	1	0	1	0	0	0	1	-1	0	1	92	95
8. Adding Water Conservation to Ordinances/ Institution of Drought Monitor as part of operations	1	1	1	-1	1	1	-1	1	1	0	90	95
11. De-icing Plans for Roads	1	0	1	1	0	0	1	-1	0	0	69	72
14. Expansive Soils Mitigation for Road Construction	1	1	1	-1	0	0	1	1	0	0	63	67



Hays County Hazard Mitigation Plan, City of Hays Annex

Mitigation Actions by Hazard

The mitigation actions are shown with corresponding hazards in Table HA.11 below.

Table HA.11, Mitigation Action Impact, City of Hays

Action Number	Drought	Extreme Heat	Severe Winter Storms	Lightning	Hailstorms	Windstorms	Tornadoes	Expansive Soils	Floods	Land Subsidence	Hurricanes/ Tropical Storms	Earthquakes	Dam/ Levee Failure	Wildfire
1									X					
2		X	X	X	X	X	X		X		X	X		X
3					X	X	X		X		X			
4		X												
5									X					
6	X	X	X	X	X	X	X	X	X		X	X		X
7			X	X										X
8	X													
9	X													
10		X	X	X		X	X				X			
11			X											
12									X					
13									X					X
14								X						



3.6 Integration Efforts

Table HA.12 captures ways that the HMP risk assessment, mitigation goals and actions can be integrated into other City of Hays documents, programs and regulations.

Table HA.12, Plan Integration Efforts, City of Hays

Name of Document	Type	Item Type	Process for Integration
Natural and Cultural Resources Assessment Report: Drainage Improvement Project, City of Hays, Texas	Plan	Action	Include MPC member in draining improvement project planning in order to integrate efforts to ensure evacuation routes receive special consideration during efforts to ensure flood measures also lend to public safety.
City of Hays Municipal Code	Regulations	Action	Integrate enforcement of water conservation stages to existing municipal code by writing an amendment and presenting to City Council for consideration and approval.
TWDB Flood Protection Planning (FPP) Grant	Funding	Action	Identify actions that can be funded through new and existing grant awards. Review existing mitigation actions for eligibility for the grant program, to include Benefit Cost consideration. Prepare grant application documents in advance to prepare for future grant application periods.
Hazard Mitigation Grant Program (HMGP)			Process involves identification of actions from Plan; obtaining Council approval to apply; notification of interest in grant to the public; completion of application for funding; if awarded, obtaining Council approval to accept; if accepted, administration of funds and implementation of project.
Pre-Disaster Mitigation (PDM)			
Flood Mitigation Assistance (FMA)			
TWDB Clean Water State Revolving Fund (CWSRF)			
Texas Water Development Fund (DFund)			Identify actions that can be funded through new and existing loans. Review existing mitigation actions for eligibility for the loan program, to include Benefit Cost consideration. Prepare loan application documents in advance to prepare for future application periods. Process involves obtaining Council approval to apply; notification of interest in loan to the public; completion of application for loan; if awarded, obtaining Council approval to accept; if accepted, administration of funds and implementation of project.



Incorporation Achievements Since Previous Plan Update

The City of Hays incorporated the HMP into other planning mechanisms as a demonstration of progress in local hazard mitigation efforts. This was achieved by identifying MPC planners and or stakeholders to participate in the creation of the Cultural Resources Assessment Report for the Drainage Improvement Project.

Section 4: Finalize Plan Update (Review, Evaluation and Implementation)

4.1 Changes in Development

As the City of Hays is a purely residential community that is close to being fully developed, there are not any significant changes of development that have occurred within the past 5 years within the City limits. The City's vulnerability to natural hazards has not increased or decreased as a result of development.

4.2 Progress in Mitigation Efforts

Past Mitigation Action Progress Reports Summary - Completed Canceled

2011 Action Number	Hazard	Title	Lead Department
1	Flood	Increase the number of Hays County communities that participate in the NFIP.	City of Hays
Cost Estimate/Funding		Schedule	Status as of 2017
Existing Staff resources, no other cost		2006-2007	Complete. Shown as complete in 2011 plan.
Cost Effectiveness			
Not independently cost-effective			

2011 Action Number	Hazard	Title	Lead Department
2	Flood	Adopt "Higher Standard" Flood Damage Prevention Ordinances	City of Hays
Cost Estimate/Funding		Schedule	Status as of 2017
Existing staff resources, no other cost		Completed September 2011	Complete. Shown as complete in 2011 plan.
Cost Effectiveness			
Not independently cost-effective			

2011 Action Number	Hazard	Title	Lead Department
15	Wildfire	Various Mitigation Actions to Reduce Wildfire Risk	City of Hays
Cost Estimate/Funding		Schedule	Status as of 2017
Existing staff resources		TBD/as need is identified	Canceled. The measure was removed and replaced by others that were modified to address wildfire.
Cost Effectiveness			
Cost-effective, as measures tend to be inexpensive and prevent fires			



2011 Action Number	Hazard	Title	Lead Department
16	Floods, Thunderstorms, High Winds, Tornadoes, Seismic	Upgrades to At-Risk Structures	City of Hays
Cost Estimate/Funding		Schedule	Status as of 2017
Varies depending on measure. Funding from General Fund or FEMA grant program/s		TBD based on study	Canceled. There is only 1 public structure in City of Hays and at this time this item is not feasible.
Cost Effectiveness			
Cost-effectiveness will vary with level of risk and project cost			

2011 Action Number	Hazard	Title	Lead Department
17	Floods, Thunderstorms, High Winds, Tornadoes, Seismic	Structural/Engineering Study of public facilities for soundness	City of Hays
Cost Estimate/Funding		Schedule	Status as of 2017
To be determined, but if initiated will probably be from General Fund		Not yet established- to be commenced only if funding is available	Canceled. As the City of Hays only has 1 public structure that is not likely to be upgraded in the near future.
Cost Effectiveness			
Not independently cost-effective, but the initial step in identifying appropriate mitigation actions			

4.3 Changes in Priorities

Plan-level priority changes are reflected in the changes to the plan-level goals shown in Chapter 3: Mitigation Strategy within the Main Plan document. Changes in priorities for the City of Hays include an interest in focusing on road resurfacing and culvert maintenance in order to reduce the impacts of flooding in the community. With the amount of water on the roads during recent flooding events, the community is concerned for the safety of residents while on the roads.





Section 5: Approval and Adoption

5.1 Approval and Adoption Procedure

The procedures for approval and adoption are described in Chapter 4.1 of the Hays County HMP Update.

Table HA.13, Municipal Jurisdiction Adoption Date

Municipality	APA Date	Adoption Date
City of Hays		



Jurisdiction Adoption Documentation Placeholder

References

- City of Hays, Texas. (2014, 02 28). The City of Hays, TX. Retrieved from City Code: <http://nebula.wsimg.com/dd3bd79eb103dcb48d9430ab7862e195?AccessKeyId=16D365FE6C05C27D9F42&disposition=0&alloworigin=1>
- Hays County. (2010, 02 27). Interlocal Agreement for Emergency Water Service. Mountain City, TX.
- National Fire Protection Association. (2013, June). NFPA News & Research. Retrieved from Lightning Fires and Lightning Strikes: <http://www.nfpa.org/news-and-research/fire-statistics-and-reports/fire-statistics/fire-causes/lightning-fires-and-lightning-strikes>
- National Highway Traffic Safety Administration. (2017, 03 11). Traffic Safety Facts. Retrieved from Texas 2011-2015: <https://cdan.nhtsa.gov/SASStoredProcess/guest>
- National Oceanic and Atmospheric Administration. (2016). Historical Hurricane Tracks. Retrieved from National Oceanic and Atmospheric Administration Coastal Management: <https://coast.noaa.gov/hurricanes/>
- National Oceanic and Atmospheric Administration Storm Event Database. (2016, 12 01). National Centers for Environmental Information. Retrieved from Data Access: <https://www.ncdc.noaa.gov/data-access>
- State of Texas . (1995, 08 28). Texas Constitution and Statutes. Retrieved from Local Government Code-Title 7. Regulation of Land Use, Structures, Businesses and Related Activities, Subtitle A. Municipal Regulatory Authority, Chapter 214 Municipal Regulation of Housing and Other Structures: <http://www.statutes.legis.state.tx.us/Docs/LG/htm/LG.214.htm>
- State of Texas. (1987, 09 1). Texas Constitution and Statutes. Retrieved from Local Government Code-Title 7. Regulation of Land Use, Structures, Businesses and Related Activities, Subtitle A. Municipal Regulatory Authority, Chapter 211 Municipal Zoning Authority, Subchapter A General Zoning Regulations: <http://www.statutes.legis.state.tx.us/SOTWDocs/LG/htm/LG.211.htm>
- State of Texas. (1997, 09 01). Texas Constitution and Statutes. Retrieved from Local Government Code-Title 7. Regulation of Land Use, Structures, Businesses and Related Activities, Subtitle A. Municipal Regulatory Authority, Chapter 213 Municipal Comprehensive Plans: <http://www.statutes.legis.state.tx.us/Docs/LG/htm/LG.213.htm>
- Texas A&M Forest Service. (2016, 12 01). Wildfire Risk Assessment Portal. Retrieved from Public Viewer: <https://www.texaswildfirerisk.com/>
- Texas Department of Transportation. (2017, 03 11). Crash Records Information System. Retrieved from C.R.I.S Query: <https://cris.dot.state.tx.us/public/Query/#/public/welcome>
- Texas Natural Resources Information System. (2011). TNRIS Data Catalog Low Water Crossings. Retrieved from TNRIS: <https://tnris.org/data-catalog>
- Tornado Facts. (2016, 03 16). Tornado Facts and Information . Retrieved from Tornado Scale: <http://www.tornadofacts.net/tornado-scale.php>
- USGS Earthquake Hazard Program. (2015). USGS Earthquake Hazard Program. Retrieved from USGS: <https://earthquake.usgs.gov/data/>



**City of
Dripping Springs**
Hays County Hazard
Mitigation Plan Update

2018



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City of Dripping Springs Annex

Section 1: Organize and Review

This section contains a brief description of the City of Dripping Springs and its jurisdictional features. In addition, Section 1 contains the following details regarding Dripping Springs’:

- participation in the Hays County HMP Update process,
- stakeholder engagement,
- public outreach strategy,
- incorporation efforts, and
- plan maintenance procedures.

*Population :	2,032
Size of Community:	6.2 sq. miles
*Population over 65 years old	262
*Population under 16 years old	584
*Economically Disadvantaged Population (\$0-\$20k)	41

Dripping Springs is serviced by the following responders:

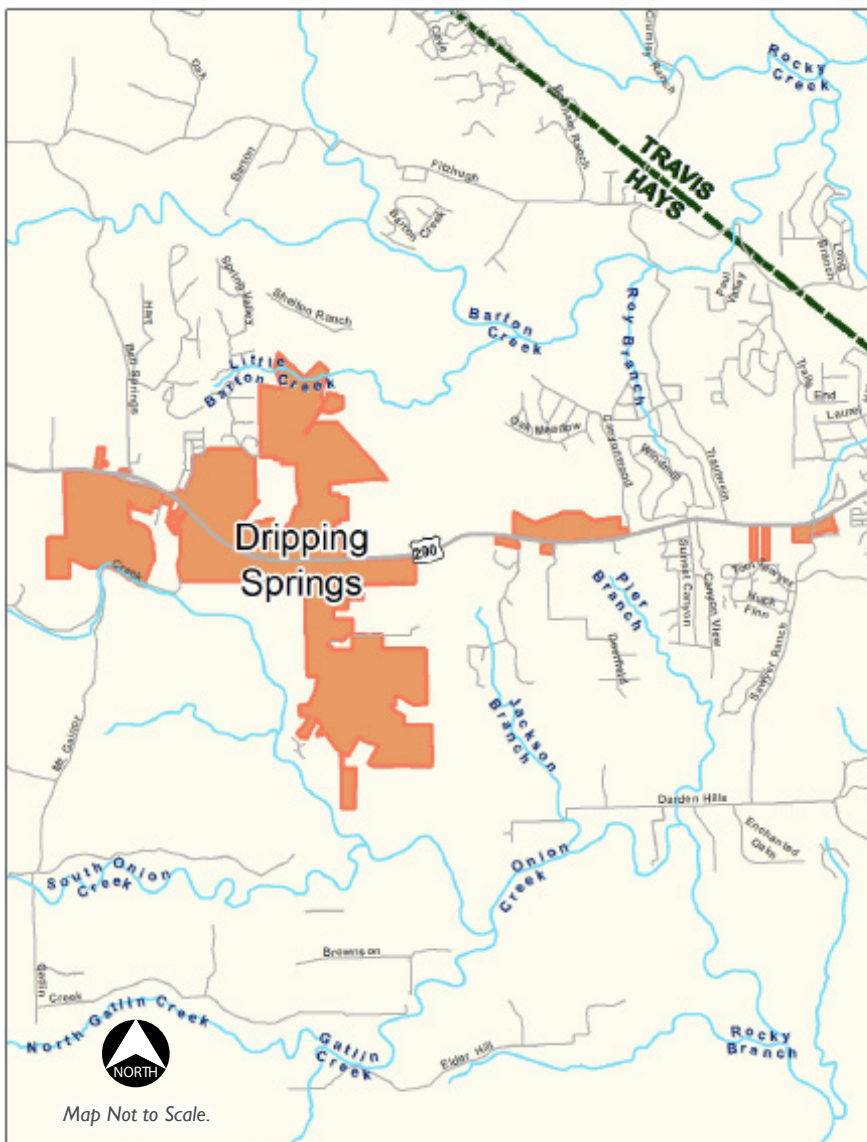
Fire - North Hays County Fire Rescue

EMS - San Marcos Hays County EMS

Law Enforcement - Hays County Sheriff’s Office

**HAZUS-MH 3.2 Updated Census 2010 Population Estimates*

Figure DS.1, City of Dripping Springs



1.1 Community Description

When planning, it is important to take into account the characteristics that make a community unique. Consideration of unique needs when it comes to mitigating or recovering from natural hazards ensures that all members of the community and their needs are addressed.

Dripping Springs lies about 25 miles west of Austin. Although the population is small within the City limits, the community has experienced a large surge of development in their extra-territorial jurisdiction areas with over 30,000 residents. There have been 2 recent annexations, 1 of which was residential and another that was commercial. At present, the greatest rate of growth is east of the City limits, but new subdivisions have been added west and northwest recently, and several have requested annexation before construction has begun. This expansion of the City limits is expected to continue well past 2020 and will impact hazard mitigation planning.

Hays County Hazard Mitigation Plan, City of Dripping Springs Annex

Incorporated in 1981 and known as the “Gateway to the Hill Country”, Dripping Springs is served by Dripping Springs Independent School District (ISD).

Dripping Springs is a Type A General Law City governed by a Mayor and 4 Council members. Dripping Springs’ major employers are shown in Table DS.1. Main utility providers are shown in Table DS.2.

Table DS.1, Major Employers

Business Type	Name of Employer
Government	Dripping Springs ISD
Retail	Home Depot
Retail	HEB
Construction	Patriot Erectors

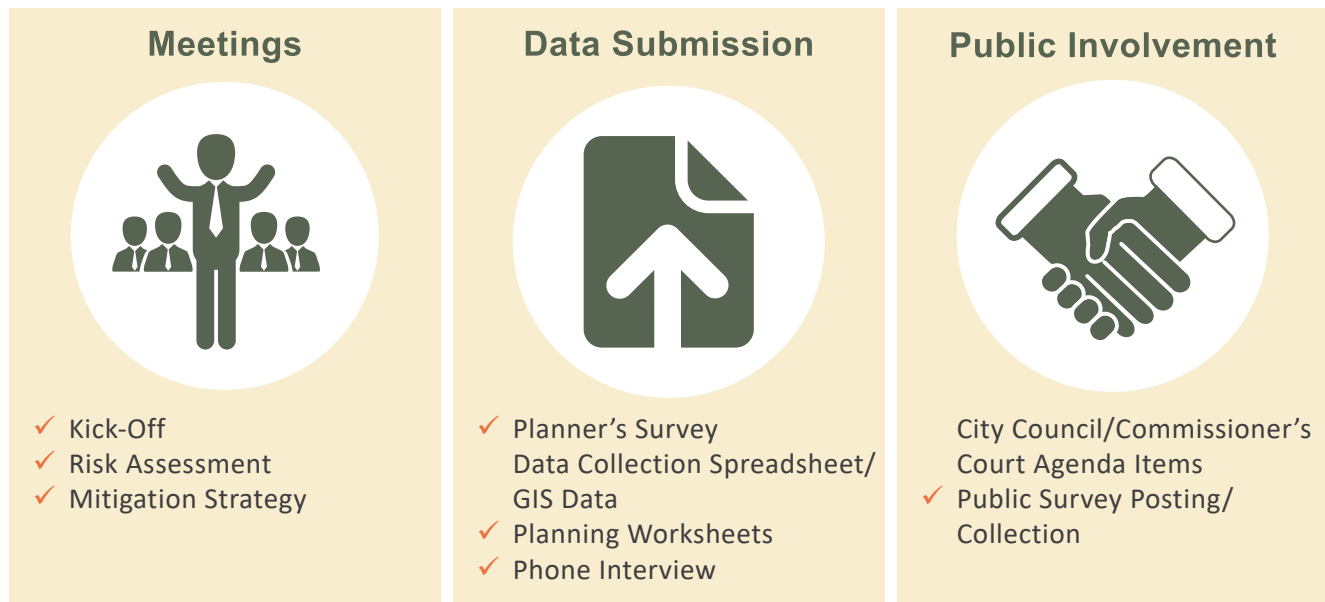
Table DS.2, Utility Providers

Type	Provider
Electric	Pedernales Electric Cooperative (PEC)
Water	Dripping Springs Water Supply Corporation

Community Planning Involvement

MPC planning activities for the Hays County Hazard Mitigation Plan (HMP) Update are captured in Figure DS.2, which utilizes check-marks to indicate each of the activities that were completed by the Dripping Springs MPC members.

Figure DS.2, City of Dripping Springs Plan Participation





1.2 Outreach Strategy

The City of Dripping Springs was very active in the following outreach activities used to request public participation in the Hays County HMP Update.

Public Survey Promotion

Dripping Springs advertised the Hays County HMP Update Public Survey on the Dripping Springs Facebook page and various local social media platforms.

As of March 10, 2017, Dripping Springs had 36 residents respond to the public survey. Details on how the survey data was directly incorporated into the risk ranking process for hazards is included in Chapter 2, the risk assessment portion of the main plan document.

Plan Phase Newsletters

Dripping Springs MPC utilized newsletters for each phase of the planning process in order to share updates with stakeholders, elected officials, City staff, and the public. Copies of the newsletters can be found in Plan Appendix A of the Hays County HMP Update.

Plan Draft Public Review and Comment Period

The draft Hays County HMP Update was posted on the City of Dripping Springs website from July 12, 2017 to July 26, 2017. A hard copy was placed in the Dripping Springs City Hall for public review. No public comments were received during this review period.



1.3 Incorporation of Sources

In addition to stakeholder and public input, the MPC also reviewed other planning resources that could provide useful information for the plan update process. Table DS.3 lists the documents reviewed and how they were considered for incorporation in the updated plan.

Table DS.3, Review/Incorporation of Sources

Name of Document	Type	How Incorporated
2013 State of Texas HMP	Plan	Utilized hazard definitions and hazard classification names.
Flood Insurance Study	Study	Incorporated best available hydraulic and hydrologic study results for flood hazard profile.
City Code of Ordinances	Regulations	Reviewed all ordinances for possible incorporation opportunities. (City of Dripping Springs , 2017)
Parks, Recreation and Open Space Master Plan		Incorporated concept of “Natural Resource Park” when considering action items. (Luck Design Team, 2015)
Tax Increment Reinvestment Zone Plan	Plan	Reviewed for incorporation of mitigation actions. <ul style="list-style-type: none">• Old Fitzhugh Rd. Street & Drainage Improvements.• Ramirez Lane Street & Drainage Improvements. (City of Dripping Springs , 2016)
Dripping Springs City-Wide Trails Plan		Reviewed for incorporation of mitigation activities (none found). (City of Dripping Springs, 2015)
2010 Comprehensive Plan Implementation Guide		Reviewed for consideration or incorporation of mitigation activities <ul style="list-style-type: none">• Goal L2: Develop a Plan for the Triangle Property Action: Develop plan for landscaping, lighting, parking and other improvements with cost-estimates within limitations of location within 100 year floodplain (flood focus).• Goal L3 Develop conceptual plan for road, drainage, and lighting improvements along Old Fitzhugh (flood focus).• Goal L8: Ensure appropriate development standards to protect the water quality of the springs and other area water bodies (drought and flood focus).• Goal I1: Incorporate Water Reuse Ordinance into revision process (focus).• Goal I2: Explore new options for wastewater reuse, including potable reuse (drought focus).• Goal I3: Review Hays County Plan to identify equipment and facilities needed in Dripping Springs for emergency management (all hazards needs focus, generator needs worked into this goal).• Goal I5: Ensure new development connects to existing development and develop additional connectivity where feasible in existing development (evacuation focus).• Goal I6: Continue to support rainwater harvesting, xeriscaping, wastewater, and other conservation efforts (drought focus).• Goal P2: Develop City Water Quality and Drainage Plan (flood focus). (City of Dripping Springs, 2016)
City of Dripping Springs Fee Schedule Ordinance 1070.63	Regulations	Reviewed fees to search for those that could be directed toward mitigation, such as a floodplain development permit fee or drainage. None found. (City of Dripping Springs, 2014)
City of Dripping Springs Residential Building Permit Application	Form	Reviewed permit to find floodplain management reference or review fields, did not locate mention to floodplain on form. (City of Dripping Springs, 2017) Also reviewed Residential Plan Review Checklist.



Section 2: Risk Assessment

City of Dripping Springs Jurisdictional Hazards

This section contains Dripping Springs' hazard profiles for each natural hazard included in the Hays County HMP Update. Profiles include:

- Location - the area where the hazard is known to occur
- Previous Occurrences - a history of reported events for the hazard
- Significant Previous Occurrences (when applicable) - notable hazard events within the community
- Extent - the strength or magnitude of the hazard
- Probability - the likelihood of the hazard event occurring in the future
- Impact - the consequence or effect (or possible effect) of hazard events
- Vulnerability Summary - identification of structures, systems, populations or assets susceptible to loss or damage and how they are/could be impacted

Hazard descriptions and extent scales for hazard magnitudes are found in Chapter 2, the risk assessment portion of the main plan document.

When available, data specific to Dripping Springs was used for hazard analysis. When no instances were reported specifically for the jurisdiction for regional hazards, County-wide data was applied.

State and national datasets were used to determine occurrence, extent, and the respective probabilities, rather than verbal testimonies, in an effort to retain data consistency. For some hazards, the National Oceanic and Atmospheric Administration (NOAA) Storm Events Database was used as the most comprehensive data available for hazards. The Storm Events Database does not always reflect the most recent totals for fatality, injury, and damage amounts for previous hazard occurrences. The Previous Occurrences paragraph identifies instances in which this may occur. Verbal testimony, when available, was integrated into impact or vulnerability summaries to account for updates in this data.

2.1 Hazard Profiles

Hazards profiled within the risk assessment include:

- Drought - Within Chapter 2, the risk assessment portion of main Plan document.
- Extreme Heat - Within Chapter 2, the risk assessment portion of main Plan document.
- Severe Winter Storms - Within Chapter 2, the risk assessment portion of main Plan document.
- Lightning - Within Chapter 2, the risk assessment portion of main Plan document.
- Hailstorms
- Windstorms
- Tornadoes
- Expansive Soils
- Floods
- Dam/Levee Failure
- Wildfires



Hailstorms

Hailstorms: Location

The entire extent of the City of Dripping Springs is exposed to some degree of hail hazard. Since hail can occur at any location, hail events could be experienced anywhere within the jurisdiction.

Hailstorms: Previous Occurrences

According to the NOAA Storm Events Database, there were 6 documented hail events listed for the City of Dripping Springs and 57 documented events listed for Hays County and its unincorporated jurisdictions from year 1967. While NOAA Storm Events Database lists events since the year 1967 for the County, events were not documented per jurisdiction until 1993.

Hailstorms: Extent and Probability

The Tornado and Storm Research Organization (TORRO) created a hail extent index to measure hail called the Hailstorm Intensity Scale. According to the reported previous hail occurrences for the City, the maximum hail extent experienced was up to 2 in., or 50.8 mm. in diameter. This size corresponds to a TORRO Hailstorm Intensity Scale classification of “Destructive.” Refer to Chapter 2, the risk assessment portion of the main plan document, for the TORRO hail extent scale descriptions.

Based on 6 reported events in 23 years, the City of Dripping Springs can expect a hail event approximately once every 4 years (on average) in the future with hail up to 2 in., or 50.8 mm. in diameter, corresponding to a TORRO Hailstorm Intensity Scale classification of “Destructive.”

Hailstorms: Impact

Potential impacts can be determined based on the maximum hail extent experienced (50.8 mm), where the TORRO Hailstorm Intensity Scale indicates that impact can be expected to include any of the following:

- Varying degrees of damage to vegetation and crops
- Damage to plastic structures
- Varying degrees of damage to glass
- Paint and wood scored
- Vehicle bodywork damage
- Tile roof damage
- Varying degrees of aircraft damage
- Brick walls pitted
- Severe roof damage
- Risk of serious injuries

Hailstorms: Vulnerability Summary

Dripping Springs City Hall, the Stephenson Building, the Ranch Park Building, and the Founder’s Park Pool House all have varying roof types that have different degrees of vulnerability to hail. Notably, the Ranch Park Building required roof repairs for hail damage experienced in 2017.

There is not a dedicated sheltering structure for protecting critical City equipment or vehicles, however the livestock arena could be used. This measure would require employee procedures to move the assets prior to inclement weather.





Windstorms

Windstorms: Location

The entire extent of the City of Dripping Springs is exposed to some degree of wind hazard. Since wind can occur at any location, wind events could be experienced anywhere within the jurisdiction.

Windstorms: Previous Occurrences

According to the NOAA Storm Events Database, there were 4 documented wind events listed for the City of Dripping Springs and 38 documented events listed for Hays County and its unincorporated jurisdictions since the year 1974. While NOAA Storm Events Database lists events since 1974 for the County, events were not documented per jurisdiction until 1994.

Windstorms: Extent and Probability

Wind is measured by the Beaufort Wind Scale that relates wind speed to observed conditions on land and sea. According to the reported previous windstorm occurrences in the planning area, the maximum wind extent experienced was 70 knots (corresponding to Beaufort Wind Scale Classification: Hurricane). Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of wind extent scales.

Based on 4 reported events in 22 years, the City of Dripping Springs can expect a wind event of up to 70 knots or 80.55 miles per hour (Beaufort Wind Scale Classification: Hurricane), approximately once every 5 to 6 years (on average) in the future.

Windstorms: Impact

Data available from the Texas Department of Transportation's Crash Records Information System shows that between the years of 2010 and May 2017, rural Hays County experienced 5 crashes related to severe crosswind weather conditions. There were no injuries reported from these crash events. Since wind events occur on a regional scale, it is assumed that weather related crashes in the surrounding County areas would be similar to those experienced in these conditions within Dripping Springs.

Table DS.4, Windstorms, Vehicle Accidents, Hays County

City	Fatality	Incapacitating Injury	Non-Incapacitating Injury	Possible Injury	Crash Year	Street Name	Surface Condition	Weather Condition
Rural Hays County	0	0	0	0	2010	LIME KILN RD	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2017	US0290	Wet	Severe Crosswinds

(Texas Department of Transportation, 2017)



Structures can be damaged by flying debris and impact from winds, damaging rooftops and causing other structural damage. Manufactured homes are especially vulnerable to damage that high winds can cause, to include destruction in the most extreme event conditions.

Critical infrastructure, such as utility poles and street signals, could also be disrupted, impacting all residents in the affected area. Debris on the roadway can also cause obstruction for emergency responders' ability to provide services.

Windstorms: Vulnerability Summary

According to community testimony, for which there is no data available for analysis purposes, Dripping Springs experienced a wind storm event in 2012 during which a storm passed through the area diagonally, hitting and damaging structures in Sunset Canyon. The potential for high wind activity is likely in the community and presently there are not actions being taken to reinforce public buildings. These buildings are critical to the continuity of government in Dripping Springs.

There is only 1 manufactured home community, called Gateway Estates, in Dripping Springs. Those residing in Gateway Estates have higher vulnerability to damages sustained from extreme wind events. Currently, the community has no identified emergency shelters.





Tornadoes

Tornadoes: Location

The entire extent of Dripping Springs is exposed to some degree of tornado hazard. Since tornadoes can occur at any location, tornado events could be experienced anywhere within the jurisdiction.

Tornadoes: Previous Occurrences

According to the NOAA Storm Events Database, there was 1 documented tornado event listed for the City of Dripping Springs and 16 documented events listed for Hays County since the year 1953. While NOAA Storm Events Database lists events since 1953 for the County, events were not documented per jurisdiction until 1997. The tornado events reported for the City of Dripping Springs are listed in Table DS.5. Community testimony also indicates that a tornado also occurred in Dripping Springs in 2015.

Fatality, injury and damage amounts are shown in Table DS.5, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table DS.5, Tornado Events, City of Dripping Springs

Location	Date	Type	Extent	Fatalities	Injuries	Property Damage	Crop Damage
Dripping Springs	3/30/2007	Tornado	EF0	0	0	0.00	0.00

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)

Tornadoes: Extent and Probability

Tornadoes are measured by severity on the Fujita and Enhanced Fujita Scales, with a range from 0-6. According to the reported previous occurrences in the jurisdiction, the maximum tornado extent experienced was a category EF0 tornado in 1953. Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of tornado extent scales, Fujita (F) Scale and Operational Enhanced Fujita (EF) Scale.

Based on 1 reported event in 19 years, the City of Dripping Springs can expect a tornado event approximately once every 19 years (on average) in the future, with up to an EF0 magnitude.

Tornadoes: Impact

Community testimony indicates that Dripping Springs experienced an EF0 tornado on May 25, 2015. Most of the damage was in the extrajurisdictional jurisdiction (ETJ), but there was a small area within the City limits that had roof and tree damage. Gateway Estates, which is mentioned in the Vulnerability Summary, had several homes that received significant damage. There were no injuries reported. The wind speeds and debris caused by tornadoes can impact all residents in the community.

If similar events were to happen in the future in the City (EF0 level), the type of impacts that the jurisdiction could expect associated with that magnitude would include:

Light Damage - Broken branches; shallow rooted trees pushed over; some chimney damage. Wind speeds between 65 to 85 mph.

(Tornado Facts, 2016)

Structures can be damaged by flying debris and impact from tornado winds, damaging rooftops and causing other structural damage. Manufactured homes are especially vulnerable to damage that tornadoes can cause, to include destruction in higher magnitude events.

Critical infrastructure, such as utility poles and street signals, could also be disrupted, impacting all residents in the affected area. Debris on the roadway can also cause obstruction for emergency responders' ability to provide services.



Tornadoes: Vulnerability Summary

Gateway Estates is the only manufactured community within the City. Those residing in Gateway Estates have higher vulnerability to tornadoes. The community has no identified emergency shelters nor does it have outdoor warning sirens.

According to community testimony, for which there is no data available for analysis purposes, Dripping Springs experienced a wind storm event in 2012 during which a storm passed through the area diagonally, hitting and damaging structures in Sunset Canyon. There is a higher potential for the high wind activity that accompanies tornado events to damage homes in this community. Additionally, there are presently no actions being taken to reinforce public buildings. These buildings are critical to the continuity of government in Dripping Springs.





Expansive Soils

Expansive Soils: Location

Figure 2.3 within Chapter 2 (the risk assessment portion of the main plan document) shows the location of expansive soil areas for the City. A small extent of the western part of the jurisdiction is classified as being underlain by soils with little to no clays with swelling potential while the majority of the jurisdiction east of that area is classified as having less than 50 percent of the area underlain by soils with clays of high swelling potential, therefore this area of the City is at more risk.

Expansive Soils: Previous Occurrences

There was no documentation of past site-specific events of structural damage due to expansive soils from local, State, or national datasets queried.

Expansive soils cannot be documented as a time-specific event, except when they lead to structural and infrastructure damage. There are no specific damage reports or historical records of events in the City, however future events can occur.

Expansive Soils: Extent and Probability

Considering the amount of swelling potential within the jurisdiction, and the lack of reported events, the probability of a future event is low (0 - 1 occurrences in the next 10 years affecting less than 5 structures).

Expansive Soils: Impact

Foundation issues for slab buildings and road base pads for mobile homes offer the most visible impacts to infrastructure and structures. Undocumented reports of small cracks to foundations and terrain could possibly be attributed to the presence of expansive soils. Deeper and longer cracks, and possible structural shifting could occur with natural conditions that increase soil swelling.

Expansive Soils: Vulnerability Summary

The western edge of the City has the least expansive soils (see Expansive Soils: Location) and can expect less impact than the rest of the City. Dripping Springs structures vary in age, with both older and newer structures throughout the City. While older homes built with less stringent building codes are more likely to experience foundation issues, recent residential developments within the community have increased the overall number of structures exposed to an event. The general lack of past occurrences leads to a lack of concern that could lessen the amount of home-owner level mitigation actions to lessen the impact of expansive soils.





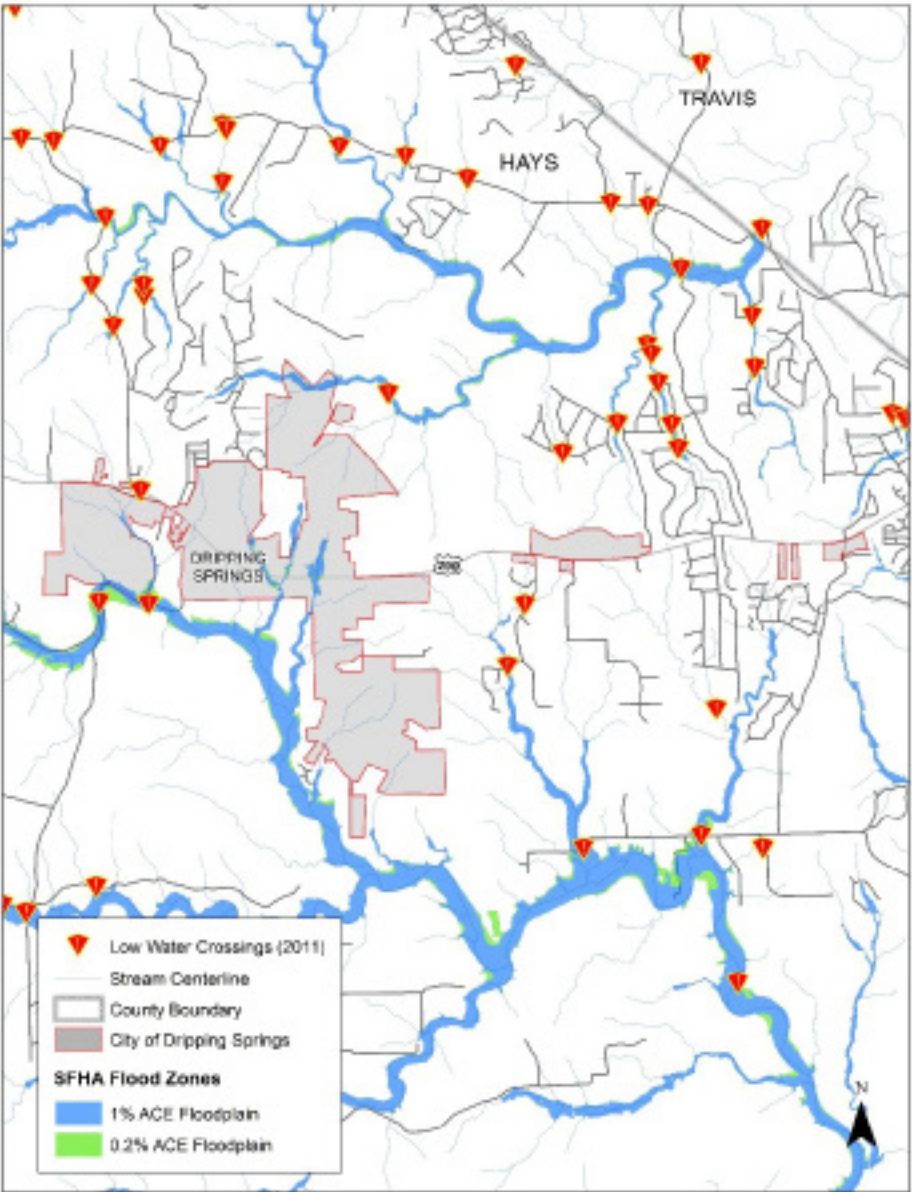
Floods

Floods: Location

The location of low water crossings, as well as the 1% (100-year) and 0.2% (500-year) Annual Chance Event (ACE) floodplains for the City of Dripping Springs are shown in Figure DS.3. This figure represents the areas most affected by riverine flooding and is based upon newly developed hydrologic and hydraulic analysis.

The new analysis is considered the best information available to date. Table DS.6 provides the total acreage in the jurisdiction that is located in the 1% and 0.2% floodplains.

Figure DS.3, Special Flood Hazard Areas and Low Water Crossings, City of Dripping Springs



(Texas Natural Resources Information System, 2011)

Table DS.6, City of Dripping Springs Floodplain Acreage

Jurisdiction	100yr (1%) Floodplain Acres (Includes Floodway)	500yr (0.2%) Floodplain ac (Includes 100yr)
City of Dripping Springs	110	125





Floods: Previous Occurrences

The County received 3 disaster declarations for flooding since October of 2013. According to the NOAA Storm Events Database, there were 5 documented flood events listed for the City of Dripping Springs and 69 documented events listed for Hays County from the year 1997. While NOAA Storm Events Database lists events since 1997 for the County, events were not documented per jurisdiction until 2004. The flood events reported for the City of Dripping Springs are shown in Table DS.7.

Fatality, injury and damage amounts are shown in Table DS.7, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table DS.7, Flood Events, City of Dripping Springs

Location	Date	Type	Fatalities	Injuries	Property Damage	Crop Damage
Dripping Springs	7/20/2007	Flash Flood	0	0	100,000.00	0.00
Dripping Springs	7/21/2007	Flash Flood	0	0	0.00	0.00
Dripping Springs	8/16/2007	Flash Flood	0	0	0.00	0.00
Dripping Springs	10/13/2013	Flash Flood	0	0	0.00	0.00
Dripping Springs	5/12/2014	Flash Flood	0	0	0.00	0.00
Total			0	0	\$100,000.00	\$0.00

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)

Floods: Significant Past Events

According to the NOAA Storm Events Database, the combination of rich Gulf moisture, an upper level low pressure system, and a strong, slow moving Pacific cold front came together to produce a line of showers and thunderstorms that moved across South Central Texas on the evening of May 12 and the early morning of May 13 of 2014.

According to the NOAA Storm Events Database, in October of 2013, an upper level trough caused southwesterly winds aloft that transported tropical moisture from the Pacific across Mexico into Texas. Surface flow from the southeast brought in low level Gulf moisture. A cold front dropped through Central Texas and provided a focus for showers and thunderstorms that produced heavy rainfall leading to flash flooding. Numerous roads were closed due to flooding around Wimberley, Driftwood, Dripping Springs, Kyle, and Buda.

Floods: Extent

Flood extent is described by a combination of ground elevation, river heights, 100-year Water Surface Elevation (WSE's) and HAZUS depth grids. An example of flooding within the jurisdiction can be found in areas along Onion Creek as these are exposed to the greatest extent of an event. Communities along Onion Creek have an approximate overbank ground elevation of 1,090-1,095 feet with an intersecting 100-year WSE's of 1,091 feet. For a 100-year event, water depth of approximately 1 foot can be expected within this area. A further analysis of Onion Creek is described below.

With Onion Creek having an approximate in-channel elevation of 1,075 feet (per Light Detection and Ranging [LiDAR] data) flood depths based on the WSE, are approximately 16 feet.





Floods: Probability

Probability has been calculated on the basis of NOAA reported events, as a standard, consistent calculation method for all hazards profiled within the Hays County HMP. Based on 5 reported events in 12 years, the City of Dripping Springs can expect a flood event approximately once every 2 years on average in the future, up to 16 feet.

Floods: Impact

The following describes the inventory counts and building replacement values for the jurisdictional area.

Dripping Springs Building Counts Within the Floodplain			
Residential	Commercial	Other	Total
743	59	35	837

Dripping Springs Building Replacement Value Within the Floodplain		
Building (\$)	Content (\$)	Total (\$)
295,507,305	175,139,448	470,646,752

A Probabilistic 100-year Return Period HAZUS-MH 3.2 analysis was run for the City of Dripping Springs. HAZUS results are calculated to census blocks. This analysis utilized the best available LiDAR (COA 2012 and CAPCOG 2008) and depth grids. These blocks were then intersected with the City to run a weighted area analysis to get jurisdictional results. The following describes results from the 100-year Return (1% Annual Chance Event) weighted area analysis.

HAZUS-MH Results

General Building Stock Damage

HAZUS estimates that about 1 building will be at least moderately damaged in the City. 'At least moderately damaged' is defined by HAZUS as greater than 10% damage to a building. For this scenario, only 1 residential building was at least moderately damaged.

Residential Buildings	Commercial Buildings	Other Buildings	Total Buildings
1	0	0	1

Building-Related Losses

Exposed Value is the total building and content values for structures within the community. The exposed value for the community is \$ 470,646,752. The total building-related losses were \$260,033 for this scenario. This represents 0.1% of the total replacement value of the community. Loss values are divided into building and content loss dollars. There were no building interruption losses.

Building Loss (\$)	Content Loss (\$)	Total Loss (\$)
170,460	89,573	260,033

Essential Facility Damage

HAZUS does not estimate any critical facilities or infrastructure interruption for more than 1 day on the day of the event. The model estimates that 100% of community hospital beds are ready for use by patients already in the hospital and for those injured by an event.





Debris Generation

HAZUS estimates the amount of debris that will be generated in this scenario. The model estimates that a total of 64 tons of debris will be generated. If the building debris tonnage is converted to an estimated number of truckloads, it will require 3 truckloads (with 1 to 25 tons per truck) to remove the building debris generated in this scenario.

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS also estimates the number of people displaced that will require accommodations in temporary public shelters. The model estimates 2 people will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, no people are estimated to seek temporary shelter in public shelters.

Floods: Vulnerability Summary

Both Dripping Springs Elementary School and Dripping Springs High School are located in the 100-year (1% ACE) floodplain. This creates a vulnerability due to the number of people that would have to be evacuated, the number of children at the elementary school dependent on adults for transportation, and the number of young adults at the high school driving through flooding conditions. Specifically, Ranch Road 12 (RR12) becomes inundated and cuts off access to the school for fire, EMS, and school transportation. Not only does RR12 affect school access but this road also serves as the main route to the entire area North of Dripping Springs. According to data from community submission and from TNRIS low water crossing data, there are 4 low water crossings within or adjacent to the jurisdictional boundaries of Dripping Springs.

National Flood Insurance Program Repetitive Loss

The City of Dripping Springs is a current participant in the National Flood Insurance Program (NFIP).

As of September of 2016, the City does not have any listed Repetitive Loss (RL) or Severe Repetitive Loss (SRL) properties according to FEMA RL/SRL data.



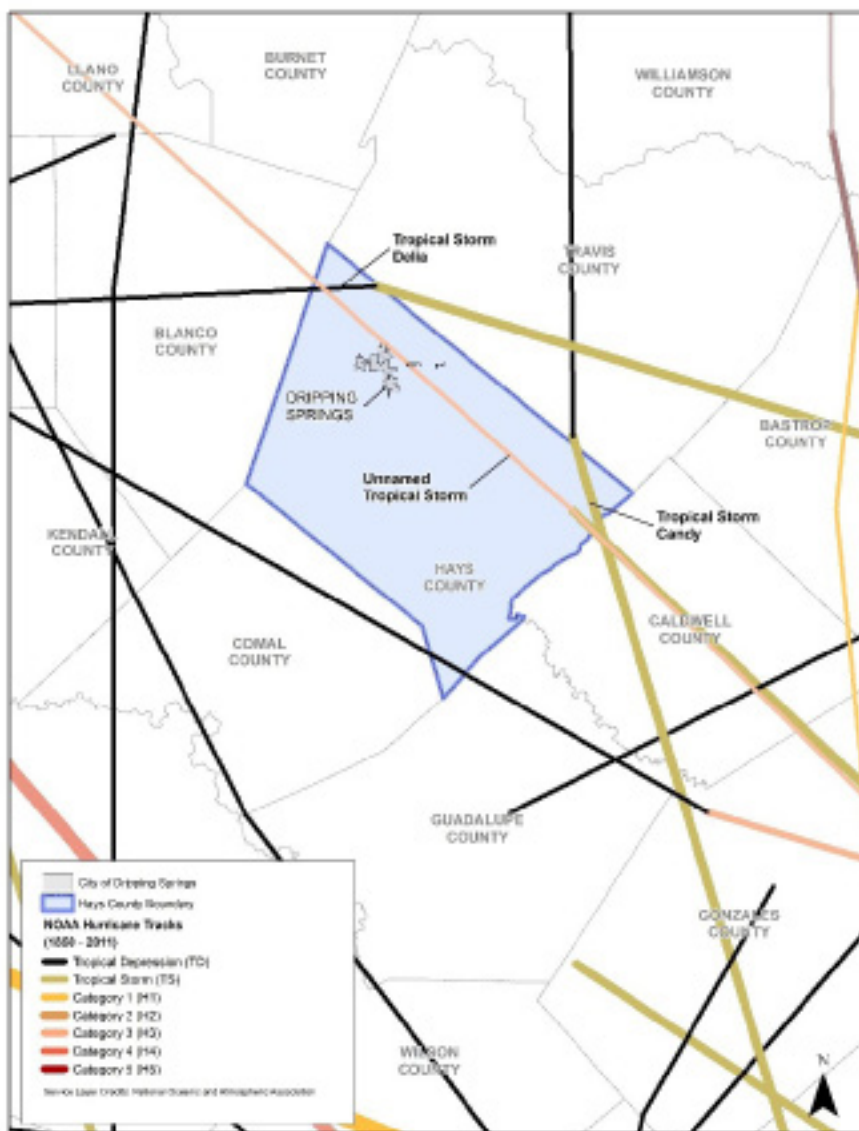


Hurricanes/Tropical Storms

Hurricanes/Tropical Storms: Location

Due to the regional nature of a hurricane or tropical storm event, the entire extent of the City of Dripping Springs is equally exposed to a hurricane or tropical storm. Figure DS.4 illustrates the location of the jurisdiction with historical hurricane and tropical storm paths documented by NOAA's Hurricane Tracker from 1850 to 2011.

Figure DS.4, Historical Hurricane/Tropical Storm Paths, City of Dripping Springs



(National Oceanic and Atmospheric Administration, 2016)

Hurricanes/Tropical Storms: Previous Occurrences

Previous events are described below based on NOAA Storm Events Database for Tropical Storm Hermine and NOAA Hurricane Tracker for all other events. By the time most hurricanes reach the County, they are tropical storms, depressions or thunderstorms. Because hurricane and tropical storm events occur on a regional scale, all events listed for Hays County have been included, as they would impact the City of Dripping Springs.

July 13 to July 22, 1909 – An unnamed storm made landfall near Freeport, as a Category 3 Hurricane. This storm impacted Hays County and participating communities as a tropical depression with wind





speeds between up to 30 knots. No significant damages, injuries, or fatalities were reported for the City.

June 22 to June 26, 1968 – Tropical Storm Candy made landfall near Port Aransas. This storm impacted Hays County and participating communities as a tropical storm with wind speeds slowing to 30 knots as a tropical depression just after leaving the County. No significant damages, injuries, or fatalities were reported for the planning area.

September 1 to September 7, 1973 – Tropical Storm Delia made landfall near the border of Brazoria and Matagorda Counties. This storm impacted Hays County and participating communities as a tropical storm with wind speeds slowing to 30 knots as a tropical depression just after leaving the County. No significant damages, injuries, or fatalities were reported for the HMP update area.

September 6 to September 8, 2010 – According to the NOAA Storm Events Database, Tropical Storm Hermine made landfall near the Texas/Mexico border on the night of September 6. South Central Texas was hit very hard with widespread rains of 8-12 inches across much of the IH-35 corridor from Austin down to San Antonio.

Hurricanes/Tropical Storms: Extent and Probability

The Saffir-Simpson Scale measures pressure, wind speed, and storm surge in 5 categories. According to the reported previous hurricane occurrences in the jurisdiction, the maximum hurricane extent experienced was categorized as a tropical storm. Refer to Chapter 2, the risk assessment portion of the Hays County HMP, for a description of storm extents.

Based on 4 reported events in 107 years, a hurricane or tropical storm event occurs approximately every 27 years on average in Hays County. Since hurricane and tropical storm events can happen anywhere throughout the HMP update area, the City of Dripping Spring's future probability is assumed to be similar to the surrounding County areas. In the future, the City can expect an event approximately once every 27 years on average, of up to a magnitude of a tropical storm at a 100-yr Max Wind Speed of 68 mph based on historical extents and HAZUS analysis.

Hurricanes/Tropical Storms Impact

A Probabilistic 100-year Return Period HAZUS-MH 3.2 analysis was run for Dripping Springs. The following describes the results of this analysis.

HAZUS-MH Results

General Building Stock Damage

The total property damage losses were \$59,554. The majority of damage can be expected to impact residential areas (98%). The remaining damages (2%) are for commercial, industrial, agricultural and religious buildings. While some building damage is experienced, it is estimated that no buildings will be completely destroyed or experience severe damage. Exposed Value is the total building and content values for structures within the community. Loss values are divided separately for building and content loss in dollars.

Exposed Value (\$) (Building + Content)	Building Loss (\$)	Content Loss (\$)	Total Loss (\$)
470,646,752	59,554	0	59,554



Essential Facility Damage

HAZUS does not estimate any critical facilities or infrastructure to be interrupted for more than 1 day on the day of the event. The model estimates that 100% of available hospital beds would be available for use by patients already in the hospital and for those injured by the hurricane.

Debris Generation

HAZUS estimates the amount of debris that will be generated by the hurricane at a total of 2 tons. Of the total amount, brick/wood comprises 100% of the total. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckload (with 1 to 25 tons per truck) to remove the building debris generated by the hurricane.

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of people displaced that will require accommodations in temporary public shelters. The model estimates no households to be displaced due to the hurricane. While there is an estimation of over \$59,000 in property damages expected, it is aforementioned that “no buildings would be completely destroyed or experience severe damage.” Residents would likely remain in their homes as damages were repaired, therefore it is estimated that no temporary shelter is needed.

Hurricane/Tropical Storms: Vulnerability Summary

Similar to the impacts of windstorms, hailstorms, and lightning, Dripping Springs can expect to be impacted with debris and possible utility interruptions of critical infrastructure. In addition, the community’s proximity to IH-35 could lead to traffic delays caused by major evacuation efforts if the highway is used as an evacuation route for coastal residents.



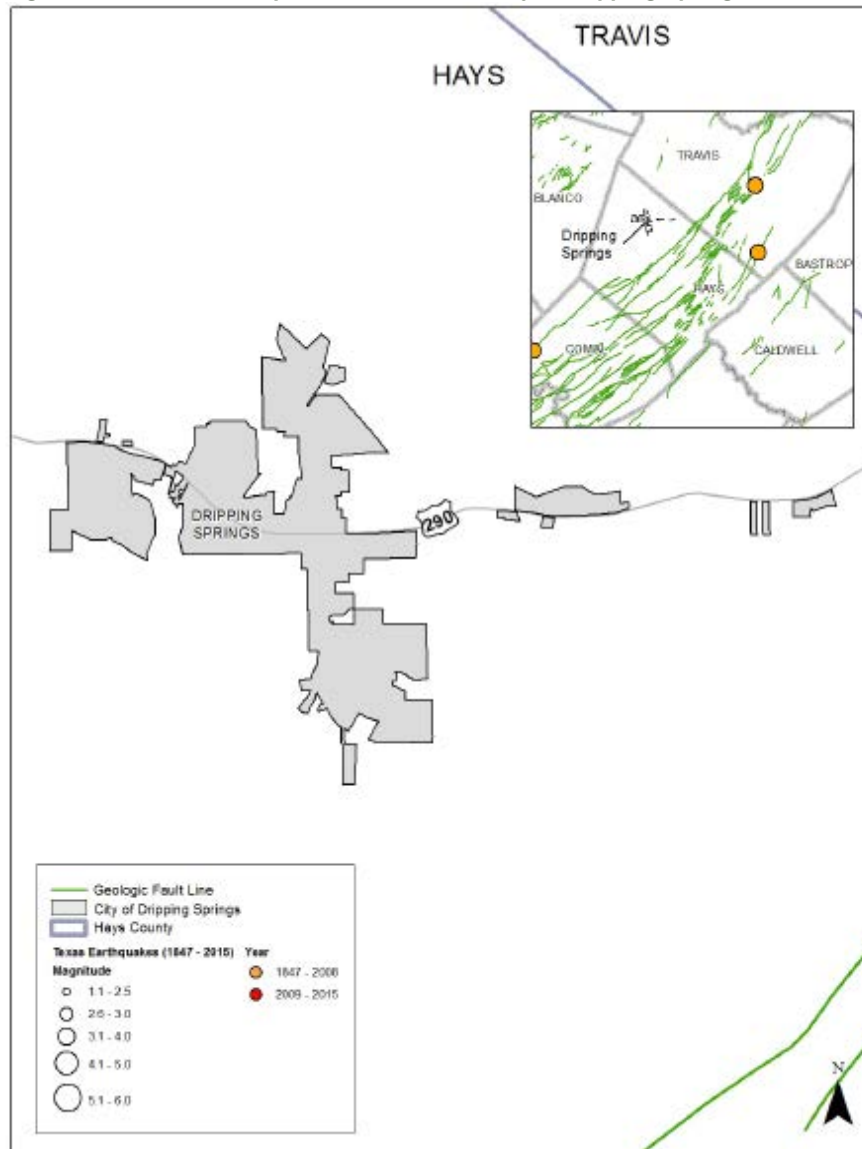


Earthquakes

Earthquakes: Location

Figure DS.5 illustrate the City of Dripping Spring's location in conjunction USGS documented earthquake events and fault lines in Texas between the years of 1847 to 2015. As seen in these figure, the City is not proximity to a fault line and has no recorded historical earthquake events. A hazard profile for earthquakes was not completed for the City due to the jurisdiction's location outside mapped potential hazard areas and a lack of previous occurrences. These two factors indicate negligible risk.

Figure DS.5, Texas Earthquakes, 1847 – 2015, City of Dripping Springs



Pages 20, 21, and 22 Dam/Levee Failure have been redacted from this copy of the plan.



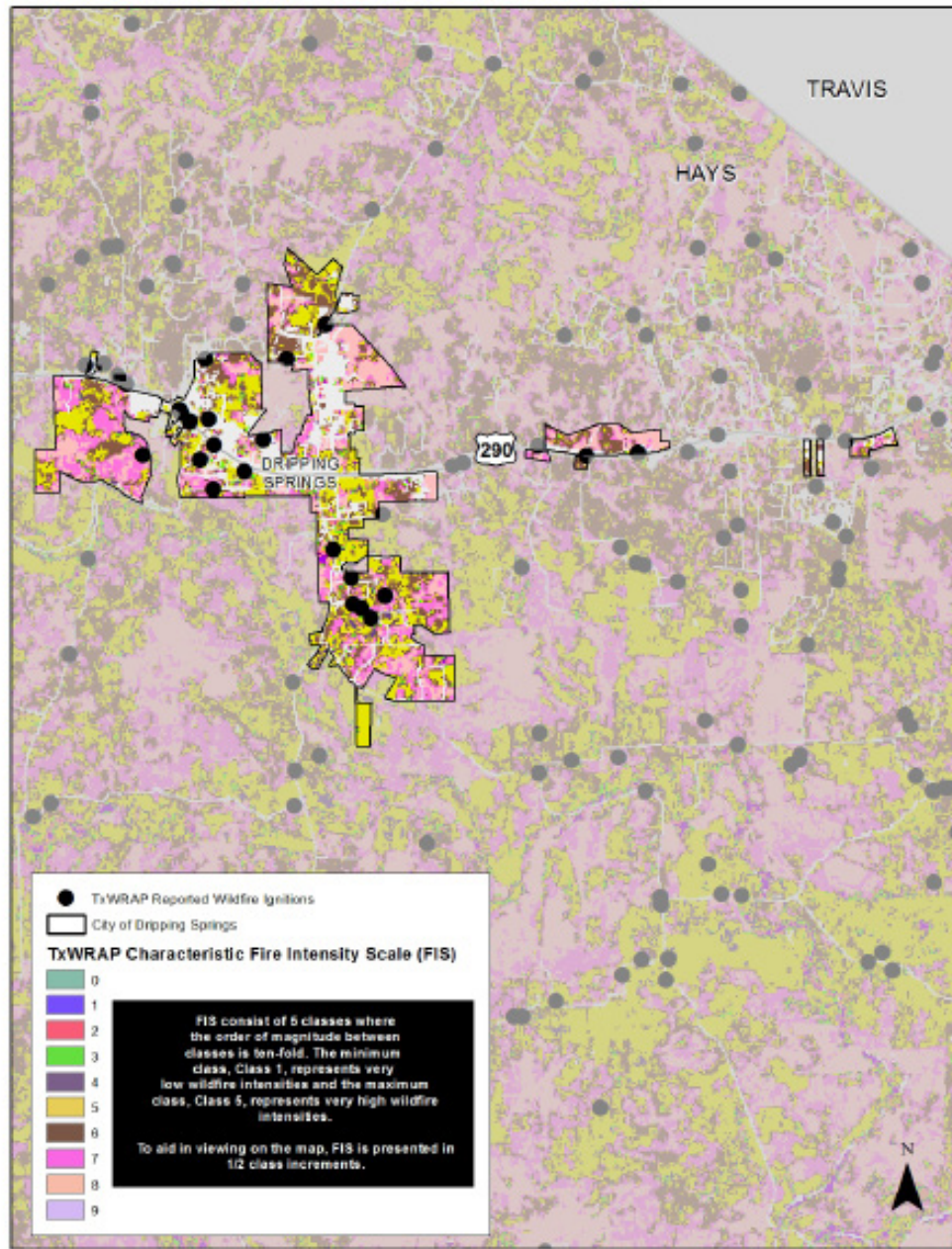


Wildfires

Wildfires: Location

Wildfires can be ignited from a variety of sources including lightning or human activity such as campfires, smoking, arson, or equipment use. The Texas A&M Forest Service's Texas Wildfire Risk Assessment Portal (TxWRAP) can be used to help communities understand their wildfire risk. Figure DS.7 below shows the location of TxWRAP's documented wildfire occurrences with Fire Intensity Scale (FIS) classifications within the City of Dripping Springs. TxWRAP identifies FIS areas as those where wildfire fuels and associated potential dangerous fire behavior exist, based on a weighted average of 4 percentile weather categories.

Figure DS.7, Fire Intensity Scale (FIS) and Reported Wildfire Ignitions, City of Dripping Springs



(Texas A&M Forest Service, 2016)





Wildfires: Previous Occurrences

Table DS.9 shows the reported wildfire ignitions within the City of Dripping Springs, according to TxWRAP and USGS Federal Fire Occurrence data from the years 1980 to 2015.

Table DS.9, Wildfire Ignitions, City of Dripping Springs

FPA ID	Date	Fire Size (Acres)
SFO-TX0482-127741	12/31/2007	0.25
SFO-TX0482-120140	1/9/2007	0.25
SFO-TX0482-126857	11/29/2007	1
SFO-TX0482-126868	11/26/2007	1
SFO-TX0482-127736	12/31/2007	0.5
SFO-TX0482-130404	2/8/2008	0.5
SFO-TX0482-120764	2/24/2007	0.5
SFO-TX02240706-54941	6/2/2006	1
SFO-TX02240706-44687	4/10/2006	1
TFS-TXFD2011-337780	8/12/2011	1
SFO-TX0482-126614	10/24/2007	1
SFO-TX02240705-6874	4/3/2005	1
SFO-TX02240705-6875	4/23/2005	1
SFO-TX02240705-10491	10/23/2005	1
SFO-TX02240706-53049	5/19/2006	1
SFO-TX02240705-6998	8/13/2005	1
SFO-TX02240705-4635	7/4/2005	1
SFO-TX0482-126615	10/26/2007	1
SFO-TX02240705-8011	8/30/2005	1
SFO-TX02240705-4637	7/4/2005	2
TFS-TXFD2009-212648	7/4/2009	2
SFO-TX0482-127791	1/9/2008	3
SFO-TX02240705-6941	6/23/2005	3
SFO-TX0482-120653	2/18/2007	10
TFS-TX2011-79039	8/12/2011	21

Wildfires: Extent and Probability

Table DS.10 lists the Fire Intensity Acreage for the City, according to the Texas A&M Forest Service TxWRAP Community Summary Report. Refer to Chapter 2, the risk assessment portion of the Hays HMP Update, for a description of the FIS.





Table DS.10, TxWRAP Fire Intensity Acreage – City of Dripping Springs

Class	Acres	Percent
Non-Burnable	937	26.40%
1 (Very Low)	20	0.60%
1.5	94	2.70%
2 (Low)	57	1.60%
2.5	39	1.10%
3 (Moderate)	753	21.20%
3.5	548	15.40%
4 (High)	552	15.50%
4.5	555	15.60%
5 (Very High)	0	0.00%
Total	3,554	100.00%



Based on 25 reported events in 35 years, the City of Dripping Springs' future probability of a wildfire event is approximately once every 1 to 2 years (on average), with up to a potential fire intensity of 4.5, or “High” classification on the TxWRAP FIS.

Wild fires: Impact

Impact on the community can be measured using TxWRAP housing density levels within the WUI. Areas with a higher housing and population density would be affected to a greater extent than rural areas, especially in areas near burnable fuels. In the event of a wildfire in high density areas of population, residential structures would be damaged or destroyed, critical infrastructure such as water, sewer and electrical services would be interrupted and residents would experience injury or loss of life. Table DS.11 below lists the population, percent of total population, WUI acreage and percent of WUI acreage for the City of Dripping Springs, according to the Texas A&M Forest Service TxWRAP Community Summary Report.

Table DS.11, WUI Acreage, City of Dripping Springs

Housing Density	WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
LT 1hs/40ac	0	0.0 %	105	3.7 %
1hs/40ac to 1hs/20ac	11	0.3 %	147	5.1 %
1hs/20ac to 1hs/10ac	44	1.2 %	309	10.8 %
1hs/10ac to 1hs/5ac	110	3.1 %	436	15.3 %
1hs/5ac to 1hs/2ac	699	19.8 %	876	30.7 %
1hs/2ac to 3hs/1ac	2,672	75.6 %	979	34.3 %
GT 3hs/1ac	0	0.0 %	0	0.0 %
Total	3,536	100.0 %	2,852	100.0 %



Wildfires: Vulnerability Summary

Fire and Emergency Services are provided to the 2,032 residents of Dripping Springs and surrounding North Hays County areas by Emergency Services District #6. The nearest station is located within Dripping Springs and has an average response time of approximately 8 minutes. Dripping Springs has recently experienced a large amount of residential development in the extraterritorial jurisdiction (ETJ). This rate of growth in an already large response area increases the need of mitigating wildfire risk. In addition, Dripping Springs has a limited number of fire breaks and lacks a brush clean-up program for residents.



2.2 Risk Ranking Result

On January 12, 2017, members of the City of Dripping Springs MPC completed a questionnaire as part of the plan update process. The questions covered the risk associated with the hazards that affect the community based on the level of concern over each profiled hazard, the hazards' impact on health and safety, as well as impact to property and business continuity. The answers from this questionnaire were combined with public survey results on perception of risk. The values from both sources were analyzed using the Halff Risk Ranking Tool (details regarding the Risk Ranking Tool are in Chapter 2, the risk assessment portion of the main plan document). The results provided a quantified ranking of risk, with values ranging from 0 to 100. The results for Dripping Springs are shown below (hazard values are shown from highest to lowest risk):

Ranking Order	Hazard	Risk Ranking Value
1	Wildfire	98.5
2	Floods	96.5
3	Drought	95.0
4	Tornadoes	72.7
5	Extreme Heat	72.0
6	Wind Storms	72.0 (same value as extreme heat)
7	Severe Winter Storms	71.6
8	Lightning	55.5
9	Hail Storms	45.9
10	Expansive Soils	39.2
11	Hurricanes/Tropical Storms	30.0
12	Dam/Levee Failure	6.0
-	Earthquakes	Not Profiled
-	Land Subsidence	Not Profiled



Section 3: Mitigation Strategy

This section examines the community's ability to perform mitigation (a review of existing capabilities is shown in Table DS.12) and identifies specific actions to address vulnerabilities for each hazard profiled in the Hays County HMP Update. The mitigation strategy is the application of actions into an approach for performing structural and non-structural mitigation efforts within the jurisdiction. Actions are also prioritized and considered for incorporation into other community programs, regulations, projects or plans.

Completed and canceled actions are also included in a separate section for future reference.

3.1 Existing Capabilities

Table DS.12, Existing Capabilities

Capabilities Name	Resource Type	Ability to Expand/Improve
Mayor	Elected Official	Political support and funding for mitigation actions/ Management of City-level HMP updates/Responsibility for continued participation in the NFIP. Could attend mitigation information session to learn about community risks and mitigation strategy.
City Secretary	City Staff	Support for implementation of mitigation actions. Could attend mitigation information session to learn about community risks and mitigation strategy.
Engineer	Staff - Consultant	Expertise in structural mitigation projects. Compliance with flood damage prevention ordinance.
Emergency Planning Specialist/ Floodplain Administrator	City Staff	Coordination of plan update and evaluation/Documents and tracks compliance with flood damage prevention ordinance. Attend advanced floodplain management training.
Emergency Management Coordinator	Staff - Contract	Evaluation of mitigation projects/Coordination of implementation. Participate in other planning committees to ensure mitigation practices are considered and used throughout community planning efforts.
Sales Tax	Funding	Provides potential funding for Hazard Mitigation items.
Property Tax		Provides potential funding for Hazard Mitigation items.
Permitting and Licensing Fees		Provides potential funding for Hazard Mitigation items.
Chapter 211 of the Local Government Code: Zoning	Authority	Authorizes the City to regulate Zoning. (State-level code)
Chapter 213 of the Local Government Code: Municipal Comprehensive Plans		Authorizes the City to adopt a comprehensive plan for the long-range development of the City. (State-level code)
Chapter 214 of the Local Government Code		Authorizes the City to have regulatory authority as it related to building code (such as structural integrity and plumbing). (State-level code)
City of Dripping Springs Fee Schedule Ordinance 1070.63	Regulations	Availability of fees that can be used toward mitigation. (City of Dripping Springs, 2014)
City of Dripping Springs Chapter 8: Fire Prevention and Protection Ordinance		Adopts International Fire Code and regulates for fire protection. (Franklin Legal Publishing, 2014) Can be enhanced to increase wildfire mitigation.
City of Dripping Springs Chapter 14: Offenses and Additional Provisions		Ability to take action against violations (Franklin Legal Publishing, 2004). Can be used to further enforce floodplain.
City of Dripping Springs Chapter 22: General Regulations (Building and Development Title II)		Ability to regulate development (Franklin Legal Publishing, 2005). Can be enhanced to increase mitigation practices.

3.2 National Flood Insurance Program Participation

The City Emergency Planner is a Certified Floodplain Manager, who administers the requirements of the Dripping Springs Flood Damage Prevention Ordinance and manages a flood safety public education program. The current Flood Damage Prevention Ordinance does not employ higher standards, beyond the minimum FEMA and State minimum requirements for floodplain management. Dripping Springs does not participate in the Community Rating System (CRS). The City will continue to consider options for higher standards and also explore options for joining the CRS. As of June 2016, Dripping Springs has 5 NFIP policies in force, with \$1,090,000 of insurance coverage. There are no repetitive loss properties in Dripping Springs.

3.3 Mitigation Goals

The plan-level Mitigation Goals can be found in Chapter 3, the Mitigation Strategy portion of the Hays County HMP Update. These goals apply to each community and were mutually decided upon as the guiding goals for the development of actions in each jurisdiction.



Hays County Hazard Mitigation Plan, City of Dripping Springs Annex

3.4 Mitigation Actions

Risk Focus is defined as:

*E= Actions reducing risk to existing buildings and infrastructure

*F= Actions reducing risk to new development and redevelopment

Number/Title	Hazard	Item Description	Implementation Agency	
1 Flood Insurance Information Campaign (previously action 1 in 2011 plan, modified)	Floods	Promote the flood insurance program to lessen the number of structures uninsured from flood loss by providing citizens access to brochures about the NFIP at the local City Hall and links to resources on website.	Dripping Springs Emergency Planning	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing City staff and free NFIP materials from FEMA publication warehouse/ in-kind services		3 months	Not started	N/A
Cost and Benefit Considerations				
This project would indirectly benefit residents who need information about the hazard at little cost.				

Number/Title	Hazard	Item Description	Implementation Agency	
2 Flood Ordinance Higher Standards (previously action 2 in 2011 plan, modified)	Floods	Create higher standards to increase protection of development in/near the floodplain.	Dripping Springs City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing City staff/ in-kind services		3 months	In progress	E/F
Cost and Benefit Considerations				
This project would be a low-cost method of ensuring that new development and substantial improvements are done with less risk for flood damage.				

Number/Title	Hazard	Item Description	Implementation Agency	
3 Attend Local Floodplain Management Courses to Receive Certification (previously action 3 in 2011 plan, modified)	Floods	Send additional members of the staff or elected officials to training in order to become a Certified Floodplain Manager. Send existing Floodplain Administrator to advanced floodplain management courses.	Dripping Springs Emergency Planning	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$250; Existing Staff, cost of accommodations for course attendance and CFM testing session, when applicable.		6 months	Not started	E/F
Cost and Benefit Considerations				
If attending the course at the Emergency Management Institute, the cost of the course would be very low. The benefit of an continuing education for the floodplain administrator would help both new and existing residents through guidance on how to mitigate flood damages to development.				

Hays County Hazard Mitigation Plan, City of Dripping Springs Annex

Number/Title	Hazard	Item Description	Implementation Agency	
4 Improve Emergency Communication/ Warning Systems (previously action 4 in 2011 plan)	Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Floods, Hurricanes/Tropical Storms, Dam/Levee Failure, Wildfires	Increase number of weather radios in all government offices, equipped with power back-up and proper programming.	Dripping Springs Emergency Planning	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$500; Existing Staff Resources/ General Fund/ in-kind services		6 months	Not started	N/A
Cost and Benefit Considerations				
This low-cost activity provides the ability for the local community to receive notifications dependably hazard conditions are dangerous. This would benefit all citizens in the community.				

Number/Title	Hazard	Item Description	Implementation Agency	
5 StormReady Designation for Dripping Springs (previously action 6 in 2011 plan)	Windstorm, Hailstorm, Severe Winter Storms, Lightning, Hurricanes/ Tropical Storms, Tornadoes, Floods	Application preparation and submission for StormReady designation from the National Weather Service that attests to the community's level of preparedness for severe winter.	Dripping Springs Emergency Planning	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ in-kind services		12 months	Delayed	N/A
Cost and Benefit Considerations				
This free application would benefit all members of the community of Dripping Springs in increasing the preparedness of the local government.				

Number/Title	Hazard	Item Description	Implementation Agency	
6 Fans and Bottled Water Distribution (previously action 7 in 2011 plan, modified)	Extreme Heat	Partner with appropriate local organizations to provide electric fans and bottled water to residents whose homes are not air-conditioned.	Dripping Springs Emergency Planning- with partnership from Home Depot, Senior Citizens Activity Center, Friends Foundation, Helping Hands and H.E.B.	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff, Donations		3 months (coordination/ preparation for summer months)	Not started	N/A
Cost and Benefit Considerations				
Beside the staff hours, these donation-based activities serves a vulnerable population of the community at little cost.				



Hays County Hazard Mitigation Plan, City of Dripping Springs Annex

Number/Title	Hazard	Item Description	Implementation Agency	
7 Increase public awareness of hazard mitigation (previously action 9 in 2011 plan, modified)	Drought, Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Expansive Soils, Floods, Hurricanes/Tropical Storms, Dam/Levee Failure, Wildfires	Increasing public awareness of natural hazards and hazardous areas; distributing information regarding hazards and potential mitigation measures. Promotional sources would include City website, social media, and public education programs. Provide link to HaysInformed on local page.	Dripping Springs Emergency Planning	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff		6 months	Ongoing	N/A
Cost and Benefit Considerations				
This free enhancement to the City's existing website would benefit all with internet access at little to no cost, except the staff resources required to do so.				



Number/Title	Hazard	Item Description	Implementation Agency	
8 Adopt Firewise Hazard Information from Hays County for Mitigation Activities (previously action 10 in 2011 plan, modified)	Wildfire	Formal adoption of Hays County Firewise maps and data for the purposes of planning activities to mitigate against wildfire risk.	Dripping Springs Emergency Planning	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff		6 months	Not started	F
Cost and Benefit Considerations				
Building upon an existing and funded County level project, the community can take action to adopt Wildfire maps and data at no cost.				

Hays County Hazard Mitigation Plan, City of Dripping Springs Annex

Number/Title	Hazard	Item Description	Implementation Agency	
9 Adding Water Conservation to Ordinances (previously actions 12 and 21 in 2011 plan, modified)	Drought	Adding drought conservation levels to ordinance to increase resiliency to drought conditions and also provide a method for monitoring drought trends on a local, regional and State-level.	Dripping Springs Emergency Planning	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		6 months	Not started	E/F
Cost and Benefit Considerations				
With the sole cost of writing and adopting new ordinance language and publication of the Drought Monitor on the website, all citizens in the City would benefit from actions that would reduce the impact of drought.				

Number/Title	Hazard	Item Description	Implementation Agency	
10 Cooling Plan for Reducing the Impacts of Extreme Heat to Vulnerable Populations (previously action 10 in 2011 plan, modified)	Extreme Heat	Developing plans for providing a cool location for vulnerable populations to seek cool conditions during times of extreme heat.	Dripping Springs City Council, possible partnership with Senior Citizens Activity Center and local churches	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ in-kind services		9 months	Not Started	N/A
Cost and Benefit Considerations				
Creation of this type of plan would benefit not only vulnerable populations, but also any other population that becomes vulnerable during circumstances that accompany extreme heat, such as power outage. This would be a low-cost project that would benefit many.				

Number/Title	Hazard	Item Description	Implementation Agency	
11 Sanding Contract Research/ Plan Development (previously action 13 in 2011 plan)	Severe Winter Weather	Creation of a plan that provides established procedures and negotiated service providers and rates for sanding.	Dripping Springs Emergency Planning	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ in-kind services		12 months	Not Started	N/A
Cost and Benefit Considerations				
By setting rates for sanding for extreme cases of icy weather, the whole community could save money on potential price increases.				



Hays County Hazard Mitigation Plan, City of Dripping Springs Annex

Number/Title	Hazard	Item Description	Implementation Agency	
12 Fire Mitigation Ordinance Enhancements (previously action 15 in 2011 plan, modified)	Wildfire	Ordinance for greenbelt maintenance, fire resistant building materials in developer agreements, zoning and construction ordinances.	Dripping Springs City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ in-kind services		12 months	Not Started	E/F
Cost and Benefit Considerations				
Researching and instituting ordinances that require fire mitigation measures would be low-cost efforts that would benefit all future development and the structures that surround it.				

Number/Title	Hazard	Item Description	Implementation Agency	
13 Continue work to repair Little Barton Creek Dam (previously action 18 in 2011 plan, modified)	Dam/Levee Failure, Flood	Continue to work with FEMA on project to repair the Little Barton Creek Dam to protect community from flooding.	Dripping Springs Emergency Planning	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Grant funded through FEMA/ in-kind services		12 months	Ongoing	E
Cost and Benefit Considerations				
Grant funding for this project is already obtained. The project was found to be Benefit Cost Effective.				

Number/Title	Hazard	Item Description	Implementation Agency	
14 Evacuation Plans/ Alternate road consideration (previously action 19 in 2011 plan, modified)	Hurricanes/ Tropical Storms, Floods, Dam/ Levee Failure, Wildfire	Documentation of an evacuation plan that includes multiple exits for leaving the community. Currently, for 20 subdivisions only have 1 access point. New subdivision requirements for multiple ingress/egress.	Dripping Springs Emergency Planning	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff, possible cost of buy out for an easement of land to develop an additional emergency exit for the community/ in-kind services		18 months	Not started	E/F
Cost and Benefit Considerations				
It is more cost effective to establish additional evacuation routes than other mitigation alternatives.				

Hays County Hazard Mitigation Plan, City of Dripping Springs Annex

Number/Title	Hazard	Item Description	Implementation Agency	
15 Conversion to Rainwater Collection Systems (previously action 20 in 2011 plan, modified)	Drought	Converting existing water systems into rainwater collection systems to reduce dependence on underground and piped in sources of water in public facilities. Also creation of tax incentives for citizens to create their own rainwater collection systems.	City of Dripping Springs	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Varies, depending on size of system		18 months	Not started	E/F
Cost and Benefit Considerations				
The long-term benefit of water resiliency is would serve all current and future citizens of Dripping Springs.				

Number/Title	Hazard	Item Description	Implementation Agency	
16 Campaign to Encourage Drought Resistant Vegetation and Xeriscaping	Drought	Lessen the amount of water utilized in the care of non-drought resistant plants by providing financial incentives within developer agreements and ordinances.	City of Dripping Springs	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-kind services		12 months	Not started	N/A
Cost and Benefit Considerations				
Incentivizing the use of drought-resistant plants may reduce the amount of revenue in the community, however the conservation of water out weighs the cost.				

Number/Title	Hazard	Item Description	Implementation Agency	
17 Flash Flood Risk Awareness Campaign	Floods	Promote distribution of Hays County map products that detail flood risk areas and low water crossings for distribution to the public.	Dripping Springs Emergency Planning	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$500 for printing (grants), existing staff		12 months	Not started	N/A
Cost and Benefit Considerations				
The low cost of printing and distributing these documents will provide all residents with decreased risk against high risk areas when traveling through the community.				



Hays County Hazard Mitigation Plan, City of Dripping Springs Annex

Number/Title	Hazard	Item Description	Implementation Agency	
18 Signage at High Risk Roadway Flood Areas	Floods	Placement of warning signs at all locations designated as low water crossings. Include gates at high traffic locations, if not already in place.	Hays County Office of Emergency Services	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$100,000 from grants and agency operating funds		24 months	Not started	N/A
Cost and Benefit Considerations				
These signs will reduce the risk of loss of life to citizens and visitors who could otherwise be injured during flood events.				

Number/Title	Hazard	Item Description	Implementation Agency	
19 Adoption of Soil Compaction Standards for Road Construction and Residential Recommendation	Expansive Soils	Adoption of road techniques that require a higher level of soil compaction to mitigate expansive soils. Recommendation documents for soil compaction to lessen the possible effects of expansive soils for residential foundations.	City of Dripping Springs Emergency Planning	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff, \$100 cost of printing		3 months	Not started	E/F
Cost and Benefit Considerations				
This free effort would increase the resilience of new roads that support the entire population of the community and provide awareness and public information that will benefit those looking to perform new development and those who are improving or repairing existing property.				



3.5 Capabilities Assessment

Evaluation/Prioritization of Actions

Each action added to the plan was developed using the Mitigation Action Summary Worksheet shown in Figure DS.8.

Figure DS.8, Mitigation Action Summary Worksheet

Hays County Hazard Mitigation Plan Update Process
Mitigation Action Summary Worksheet

Community Name: _____
Person completing questionnaire: _____

Mitigation Action/ Project Title	
Background/ Issue	
Opportunities for Integration	
Responsible Agency	
Partners	
Strategy for Existing Structures	

Hays County Hazard Mitigation Plan Update Process
Mitigation Action Summary Worksheet

Strategy for Future Development	
Potential Funding	
Cost Estimate (Values from "Measuring Costs" fields from Benefit and Cost Review Worksheet)	
Benefits (Statements from the "Difference" fields on the Benefit and Cost Review Worksheet)	
Timeline	
Priority (Based off Priority worksheet)	



Hays County Hazard Mitigation Plan, City of Dripping Springs Annex

Table DS.13, Mitigation Action Prioritization (with Hazards in order of highest priority to lowest)

Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community	Risk Ranking Score	Total Score
8. Adopt Firewise hazard information from Hays County for mitigation activities	1	1	1	1	0	1	1	1	1	1	99	108
7. Increase public awareness of hazard mitigation	1	1	1	1	0	1	1	1	0	1	99	107
13. Continue work to repair Little Barton Creek Dam	1	1	1	1	1	1	1	1	1	1	97	107
4. Improve emergency communication/warning systems	1	0	1	1	1	0	1	1	0	1	99	106
14. Evacuation Plans/Alternate road consideration	1	0	1	1	1	0	1	1	0	1	99	106
17. Flash Flood Risk Awareness Campaign	1	0	1	1	1	0	1	1	1	1	97	105
18. Signage at High Risk Roadway Flood Areas	1	0	1	1	1	0	1	1	1	1	97	105
5. StormReady Designation for Dripping Springs	1	0	1	1	0	0	1	1	0	1	97	103
9. Adding Water Conservation to Ordinances/institution of Drought Monitor as part of operations	1	0	1	1	0	1	1	1	1	1	95	103
16. Campaign to encourage drought resistant vegetation and xeriscaping	0	1	1	1	0	1	1	1	1	1	95	103
15. Conversion to rainwater collection systems where feasible for public facilities	0	0	1	1	0	1	1	1	1	1	95	102
1. Flood Insurance Information Campaign	0	0	1	1	0	0	1	1	0	0	97	101
3. Attend Local Floodplain Management Courses to receive certification	1	1	1	0	0	0	0	1	0	0	97	101
12. Fire Mitigation Ordinance Enhancements	1	1	1	-1	0	-1	-1	1	0	1	99	101
2. Flood Ordinance Higher Standards	1	1	1	-1	0	1	-1	1	0	0	97	100
6. Fans and Bottled Water Distribution	1	0	1	1	0	0	1	1	1	1	72	79
10. Cooling Plan for Reducing the Impacts of Extreme Heat to Vulnerable Populations	1	0	1	1	-1	0	1	1	1	1	72	78
11. Sanding Contract Research/ Plan Development	1	0	1	1	1	0	1	1	0	0	72	78
19. Expansive Soil Information Sheet	0	1	1	0	0	0	1	1	0	1	39	44



Mitigation Actions by Hazard

The mitigation actions are shown with corresponding hazards in Table DS.14 below.

Table DS.14, Mitigation Action Impact, City of Dripping Springs

Action Number	Drought	Extreme Heat	Severe Winter Storms	Lightning	Hailstorms	Windstorms	Tornadoes	Expansive Soils	Floods	Land Subsidence	Hurricanes/Tropical Storms	Earthquakes	Dam/Levee Failure	Wildfire
1									X					
2									X					
3									X					
4		X	X	X	X	X	X		X		X		X	X
5			X	X	X	X	X		X		X			
6		X												
7	X	X	X	X	X	X	X	X	X		X		X	X
8														X
9	X													
10		X												
11			X											
12														X
13									X				X	
14									X		X		X	X
15	X													
16	X													
17									X					
18									X					
19								X						



3.6 Integration Efforts

Table DS.15 captures ways that the HMP risk assessment, mitigation goals and actions can be integrated into other City of Dripping Springs documents, programs and regulations.

Table DS.15, Plan Integration Efforts, City of Dripping Springs

Name of Document	Type	Item Type	Process for Integration
Dripping Springs Flood Damage Prevention Ordinance	Regulation	Action	Integrate higher standards into Flood Damage Prevention Ordinance, per Mitigation Action 2. MPC to provide proposed enhancement language to Floodplain Administrator for consideration and possible inclusion in packet for action for City Council for consideration and adoption.
Dripping Springs Adopted Budget 2017 (City of Dripping Springs, Texas, 2016)	Document		Obligate funding for floodplain management training, certification testing into existing Training Budget line item to support Mitigation Action 3. Provide recommended line item change for consideration during annual community fiscal year budgeting activities.
City of Dripping Springs Website (City Sponsored Events)	Website		Add fan and bottled water collection to City -sponsored events on Dripping Springs website by writing proposed language and submitting to City website coordinator.
City of Dripping Springs Website (City Maps & Master Plans page)	Website	Goals	Add HMP to City Maps & Master Plans page by submitting to City website coordinator.
Zoning	Process	Risk Assessment	Hazard area consideration and mitigation planner involvement in community zoning activities to implement community risk assessment information for hazard areas and risk.
Senior Citizens Activity Center	Programs	Goals	Engage volunteers from the Senior Citizens Activity Center to provide feedback and insight on mitigation actions needed to serve the elderly demographic. Include representatives as stakeholders for future mitigation planning activities.
Parks, Recreation and Open Space Master Plan	Plan	Action	Work with Parks planners to encourage rainwater collection systems where feasible (Action 15) and the use of drought resistant vegetation and xeriscaping (Action 16).
HaysInformed.com	Program	Action	Coordinate with Hays County Emergency Management for co-marketing Flash Flood Risk Awareness Campaign by linking to each website and collaborating on map products and distribution efforts (Action 17).



Table DS.15, Plan Integration Efforts, City of Dripping Springs (cont.)

Name of Document	Type	Item Type	Process for Integration
Hays County Flood Warning Signs	Plan	Action	Collaborate with existing Hays County mitigation action to increase the warning signs and barricades placed at high velocity areas in Hays County. Prepare estimate for cost of project. Request City Council approval for pursuing HMA grant funding for the project. If approved, apply for the grant through proper State and Federal contacts.
TWDB Flood Protection Planning (FPP) Grant	Funding		Identify actions that can be funded through new and existing grant awards. Review existing mitigation actions for eligibility for the grant program, to include Benefit Cost consideration. Prepare grant application documents in advance to prepare for future grant periods.
TWDB Flood Protection Planning (FPP) Grant			Process involves identification of actions from Plan; obtaining Council approval to apply; notification of interest in grant to the public; completion of application for funding; if awarded, obtaining Council approval to accept; if accepted, administration of funds and implementation of project.
TWDB Clean Water State Revolving Fund (CWSRF)			Identify actions that can be funded through new and existing loans. Review existing mitigation actions for eligibility for the loan program, to include Benefit Cost consideration. Prepare loan application documents in advance to prepare for future application periods.
Texas Water Development Fund (DFund)			Process involves obtaining Council approval to apply; notification of interest in loan to the public; completion of application for loan; if awarded, obtaining Council approval to accept; if accepted, administration of funds and implementation of project.

Incorporation Achievements Since Previous Plan Update

The City of Dripping Springs incorporated the HMP into other planning mechanisms as a demonstration of progress in local hazard mitigation efforts. This was achieved by identifying MPC planners and or stakeholders to participate in the following local planning efforts:

- Tax Increment Reinvestment Zone Plan
- Dripping Springs City-Wide Trails Plan



Section 4: Finalize Plan Update (Review, Evaluation, and Implementation)

4.1 Changes in Development

Since the 2011 planning period, the City of Dripping Springs has had significant residential growth in their ETJ. Estimates show that their ETJ population is nearing or surpassing 30,000 residents. Still operating as a small town within the City limits, the City offices may be the next entity to experience a surge of growth to accommodate the needs of many newcomers in both residential and commercial aspects. During the transition period of infrastructure and government development expanding to meet the demands of growth, the vulnerability may be increased. However, the renovation of older structures and development of new facilities built with increased resiliency standards will decrease vulnerability once projects are completed.

4.2 Past Mitigation Action Progress Reports Summary - Completed and Canceled

2011 Action Number	Hazard	Item Description	Lead Department
2	Flood	Adopt Higher Standard Flood Damage Prevention Ordinances	City of Dripping Springs
Cost Estimate/Funding		Schedule	Status as of 2017
Cost and Funding: Existing staff resources, no cost		Complete	Completed
Cost Effectiveness			
Not independently cost-effective			

2011 Action Number	Hazard	Item Description	Lead Department
5	All Hazards	Development and maintenance of County-wide and individual community HAZMAP plans	City of Dripping Springs
Cost Estimate/Funding		Schedule	Status as of 2017
Existing staff resources		Original plan adopted on April 20, 2004	Completed
Cost Effectiveness			
Not independently cost-effective			

2011 Action Number	Hazard	Item Description	Lead Department
8	Flood	Promote Flood Insurance	City of Dripping Springs
Cost Estimate/Funding		Schedule	Status as of 2017
\$2,000		Ongoing	Canceled. Was combined with item 1, to increase NFIP policy coverage.
Cost Effectiveness			
Not independently cost-effective, but the initial step in identifying appropriate mitigation actions.			



Hays County Hazard Mitigation Plan, City of Dripping Springs Annex

2011 Action Number	Hazard	Item Description	Lead Department
11	Drought	Monitor Drought Conditions	City of Dripping Springs
Cost Estimate/Funding		Schedule	Status as of 2017
No additional cost- uses existing staff resources		Ongoing	Canceled. Combined with Water Conservation Action (current action 9)
Cost Effectiveness			
Not independently cost-effective			

2011 Action Number	Hazard	Item Description	Lead Department
16	Tornadoes, Thunderstorm, Wind, Winter Storm, Hail	Upgrades to At-Risk Structures	City of Dripping Springs
Cost Estimate/Funding		Schedule	Status as of 2017
Varies depending on measure. Funding from General Fund or FEMA grant programs		TBD based on study	Canceled. Effort was replaced by more feasible ordinance actions.
Cost Effectiveness			
Cost-effectiveness will vary with level of risk and project cost.			

2011 Action Number	Hazard	Item Description	Lead Department
17	Tornadoes, Thunderstorm, Wind, Winter Storm, Hail	Structural/Engineering Study	City of Dripping Springs
Cost Estimate/Funding		Schedule	Status as of 2017
To be determined, but if initiated probably from General Fund		Not yet established-to be commenced only if funding is available	Canceled. Replaced with more financially feasible actions
Cost Effectiveness			
Not independently cost-effective, but the initial step in identifying appropriate mitigation actions.			



4.3 Changes in Priorities

As with many of the other communities in Hays County, the priorities for Dripping Springs changed with the recent occurrence of tragic wildfire and flooding disasters that claimed lives and property. The Bastrop Complex Fire of 2011 brought about great concern regarding wildfires and the Halloween Floods of 2015 raised awareness and attention for the needs for flood mitigation in the community.

In addition to the priorities changed by natural hazards, there has been a change initiated by the growth of the community and movement of new citizens into their ETJ. This recent surge brings with it concern for the resources available to all who reside in Dripping Springs, most notably water. For this reason, water conservation and drought mitigation measures have also become a priority to the community and those who live there.



Section 5: Approval and Adoption

5.1 Approval and Adoption Procedure

The procedures for approval and adoption are described in Chapter 4.1 of the main plan document.

Table DS.16, Municipal Jurisdiction Adoption Date

Municipality	APA Date	Adoption Date
Dripping Springs		



Jurisdiction Adoption Documentation Placeholder

References

- City of Dripping Springs . (2016, 11 29). Dripping Springs Maps. Retrieved from TIRZ Map: <http://www.cityofdrippingsprings.com/users/TIRZMap.pdf>
- City of Dripping Springs . (2017, 03 24). City Code of Ordinances. Retrieved from Ordinances : http://www.cityofdrippingsprings.com/default.aspx?name=city.code_ords
- City of Dripping Springs. (2014, 09 16). Fee Schedule. Retrieved from Ordinance No. 1070.63 Fee Schedule : http://www.cityofdrippingsprings.com/users/code_ords/Ordinance%201070.63%20Amending%20the%20Fee%20Schedule%20OSSF%20Food%20Establishment%20Farmers%20Market%2001.12.2016.pdf
- City of Dripping Springs. (2015, 06 01). City Maps. Retrieved from Dripping Springs City-Wide Trails Plan: [http://www.cityofdrippingsprings.com/users/DS%20CityWideTrail%20Plan%20Revised%20July%2014%20\(3\).pdf](http://www.cityofdrippingsprings.com/users/DS%20CityWideTrail%20Plan%20Revised%20July%2014%20(3).pdf)
- City of Dripping Springs. (2016, 11 15). Comprehensive Plan. Retrieved from City of Dripping Springs Implementation Guide 2016: <http://www.cityofdrippingsprings.com/users/FinalImplementationGuide.pdf>
- City of Dripping Springs. (2017, 03 24). Development Department . Retrieved from Residential Building Permit Application: <http://www.cityofdrippingsprings.com/users/Dripping%20Springs%20Residential%20permit%20application%208-19-15.pdf>
- City of Dripping Springs Dam. (2017, 2 1). Retrieved from Dripping Springs Century News: <https://www.drippingspringsnews.com/tag/city-dripping-springs-dam>
- City of Dripping Springs, Texas. (2016, 09 13). City Code of Ordinances. Retrieved from Ordinance No. 1100.72- 2017 Fiscal Budget: http://www.cityofdrippingsprings.com/users/code_ords/Ordinance%201100.72%20Adopting%20the%20FY17%20Budget%2009.13.2016.pdf
- Franklin Legal Publishing. (2004, 09 14). Dripping Springs Code of Ordinances. Retrieved from Chapter 14: Offenses and Additional Provisions: <http://z2.franklinlegal.net/franklin/Z2Browser2.html?showset=drippingspringsset>
- Franklin Legal Publishing. (2005, 04 12). Dripping Springs Code of Ordinances. Retrieved from Chapter: 22 General Regulations: <http://z2.franklinlegal.net/franklin/Z2Browser2.html?showset=drippingspringsset>
- Franklin Legal Publishing. (2014, 06 10). Dripping Springs Code of Ordinances. Retrieved from Chapter 8: Fire Prevention and Protection: <http://z2.franklinlegal.net/franklin/Z2Browser2.html?showset=drippingspringsset>
- Luck Design Team. (2015, 03 10). Dripping Springs Maps. Retrieved from Parks, Recreation and Open Space Master Plan: <http://www.cityofdrippingsprings.com/users/2014-2024%20Parks%20Recreation%20Open%20Space%20Master%20Plan%20SMALL%20FINAL%20-03-10-2015.pdf>
- National Fire Protection Association. (2013, June). NFPA News & Research. Retrieved from Lightning Fires and Lightning Strikes: <http://www.nfpa.org/news-and-research/fire-statistics-and-reports/fire-statistics/fire-causes/lightning-fires-and-lightning-strikes>
- National Highway Traffic Safety Administration. (2017, 03 11). Traffic Safety Facts. Retrieved from Texas 2011-2015: <https://cdan.nhtsa.gov/SASStoredProcess/guest>
- National Oceanic and Atmospheric Administration. (2016). Historical Hurricane Tracks. Retrieved from National Oceanic and Atmospheric Administration Coastal Management: <https://coast.noaa.gov/hurricanes/>
- National Oceanic and Atmospheric Administration Storm Event Database. (2016, 12 01). National Centers for Environmental Information. Retrieved from Data Access: <https://www.ncdc.noaa.gov/data-access>

- Texas A&M Forest Service. (2016, 12 01). Wildfire Risk Assessment Portal. Retrieved from Public Viewer: <https://www.texaswildfirerisk.com/>
- Texas Department of Transportation. (2017, 03 11). Crash Records Information System. Retrieved from C.R.I.S Query: <https://cris.dot.state.tx.us/public/Query/#/public/welcome>
- Texas Natural Resources Information System. (2011). TNRIIS Data Catalog Low Water Crossings. Retrieved from TNRIIS: <https://tnris.org/data-catalog>
- Tornado Facts. (2016, 03 16). Tornado Facts and Information . Retrieved from Tornado Scale: <http://www.tornadofacts.net/tornado-scale.php>
- USGS Earthquake Hazard Program. (2015). USGS Earthquake Hazard Program. Retrieved from USGS: <https://earthquake.usgs.gov/data/>



City of Kyle
Hays County Hazard
Mitigation Plan Update
2018



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City of Kyle Annex

Section 1: Organize and Review

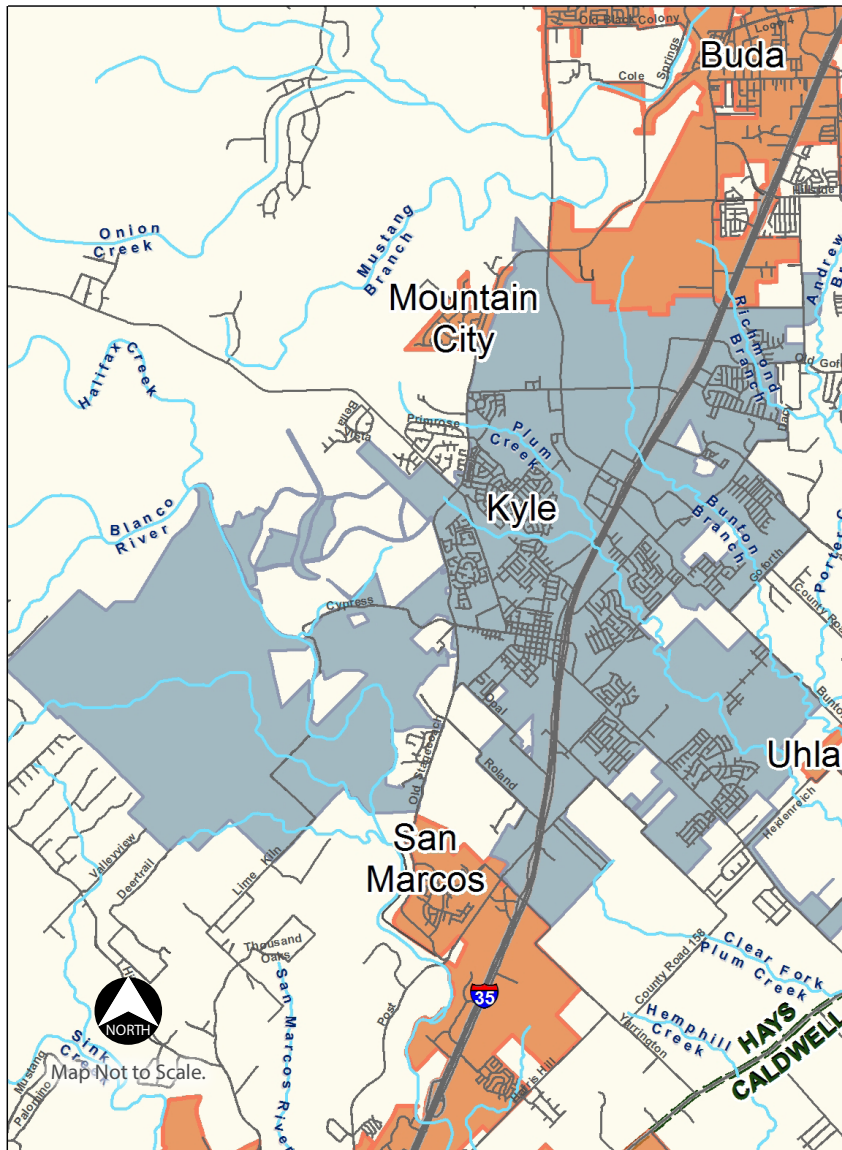
This section contains a brief description of the City of Kyle and its jurisdictional features. In addition, Section 1 contains the following details regarding Kyle's:

- participation in the Hays County HMP Update process,
- stakeholder engagement,
- public outreach strategy,
- incorporation efforts, and
- plan maintenance procedures.

*Population :	28,840
<i>(US Census 2016 population estimate: 36,800)</i>	
Size of Community:	30.39 sq. miles
*Population over 65 years old	1,261
*Population under 16 years old	9,644
*Economically Disadvantaged Population (\$0-\$20k)	635
Kyle is serviced by the following responders:	
Fire – ESD #5	
EMS - ESD # 5	
Law Enforcement- Kyle Police Department	

**HAZUS-MH 3.2 Updated Census 2010 Population Estimates*

Figure KY.1, City of Kyle



1.1 Community Description

When planning, it is important to take into account the characteristics that make a community unique. Consideration of unique needs when it comes to mitigating or recovering from natural hazards ensures that all members of the community and their needs are addressed.

The City was incorporated in 1928 and is located in Hays County, in close proximity to the City of Austin. This convenience is attractive to residents seeking alternatives from the densely populated Austin area. With an annexation in 2016, the City now covers 30.39 square miles consisting of 19,450 acres of land, 188 acres of waters or waterways, and contains approximately 139 miles of public streets. According to the 2010 census, Kyle's population was 28,016 and 30,875 in 2012. Kyle's population as of 2016 is estimated to be 36,800 with approximately 11,000 residential homes and 320 commercial businesses in the City.

According to data from the *Master Parks and Recreation Plan*, 77% of the existing dwellings in Kyle were built since 2000. The City is continuing to grow at a rapid rate.

Hays County Hazard Mitigation Plan, City of Kyle Annex



The City is operated under a Council-Manager form of government and governed by an elected mayor and 6 City Council members. The City Council and planning and zoning commission regulate development within the City. Kyle has a Public Works Department, Planning Department, Engineering Department, and a sophisticated Building Department, all of which play a role in development in the City. The community is served by the Hays Consolidated Independent School District (ISD).

Kyle's major employers are shown in Table KY.1. The main utility providers for Kyle are shown in KY.2.

Table KY.1, Major Employers

Business Type	Name of Employer
Education	Hays CISD
Medical	Seton Medical Center Hays
Retail	Home Depot
Government	City of Kyle
Retail	Lowes
Education	Austin Community College- Kyle Campus
Retail	HEB Plus
Medical	Legend Oaks Healthcare & Rehabilitation
Retail	Target
Education	Austin Community College Hays Campus
Retail	Kohl's
Small Industry	Construction Metal Products
Small Industry	Southwestern Pneumatic
Small Industry	Miscellaneous Steel Industries

Table KY.2, Utility Providers

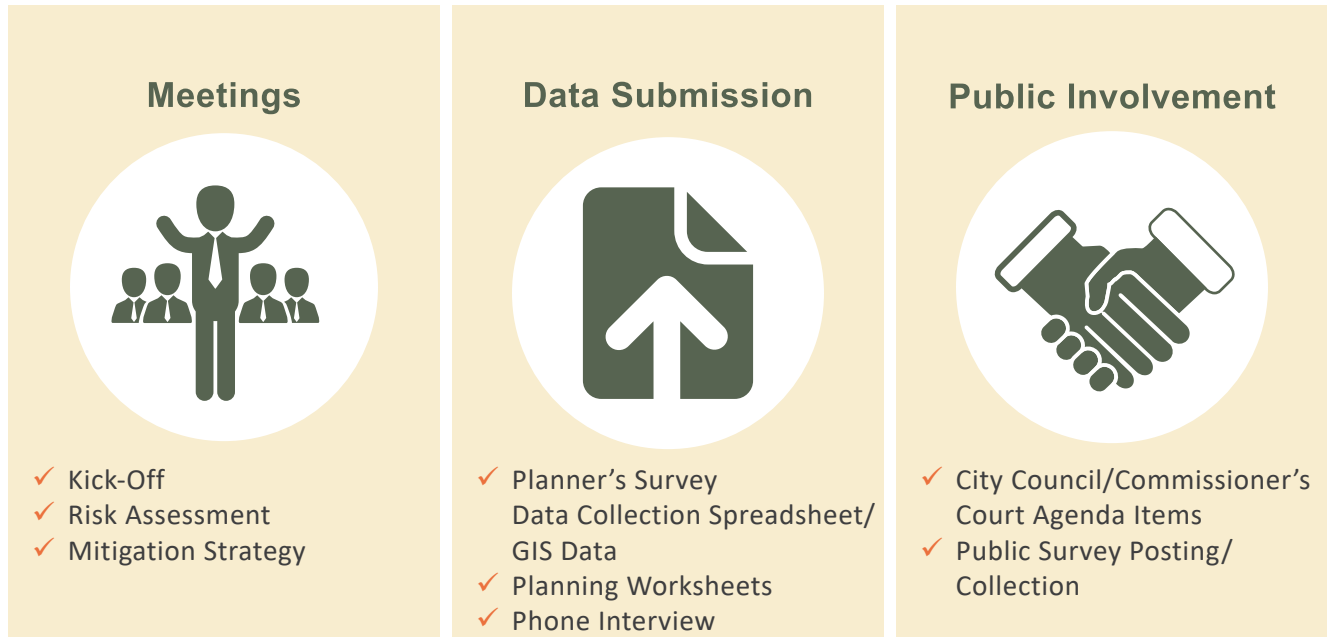
Type	Provider
Electric	Pedernales Electric Cooperative (PEC)
Water	City of Kyle, Monarch, County Line, and Goforth



Community Planning Involvement

MPC planning activities for the Hays County Hazard Mitigation Plan (HMP) Update are captured in Figure KY.2, which utilizes check-marks to indicate each of the activities that were completed by the Kyle MPC members.

Figure KY.2, City of Kyle Plan Participation



1.2 Outreach Strategy

The City of Kyle was very active in their outreach activities used to request public participation in the Hays County HMP Update.

Public Survey Promotion

Kyle advertised the Hays County HMP Update Public Survey on the Weekly E-News newsletter, Kyle Facebook page, and City of Kyle homepage www.cityofkyle.com.

As of March 10, 2017, Kyle had 23 residents respond to the public survey. Details on how the survey data was directly incorporated into the risk ranking process for hazards is included in Chapter 2, the risk assessment portion of the main plan document.

City Council Meeting Announcement

On January 17, 2017, the Stormwater Management Plan Administrator presented information on the Hays County HMP Update to the Kyle City Council. Elected officials, local agency leaders, and members of the public attended the meeting. The Council presentation is included in Plan Appendix A of the Hays County HMP Update.

Plan Phase Newsletters

Kyle MPC utilized newsletters for each phase of the planning process in order to share updates with stakeholders, elected officials, City staff, and the public. Copies of the newsletters can be found in Plan Appendix A of the Hays County HMP Update.



Plan Draft Public Review and Comment Period

The link to the draft Hays County HMP Update was posted on the City of Kyle website from July 12, 2017 to July 26, 2017. A hard copy was placed in the Kyle City Hall for public review. No public comments were received during this review period.

1.3 Incorporation of Sources

In addition to stakeholder and public input, the MPC also reviewed other planning resources that could provide useful information for the plan update process. Table KY.3 lists the documents reviewed and how they were considered for incorporation in the updated plan.

Table KY.3, Review/Incorporation of Sources

Name of Document	Type	How Incorporated
2013 State of Texas HMP	Plan	Utilized hazard definitions and hazard classification names.
Flood Insurance Study	Study	Incorporated best available hydraulic and hydrologic study results for flood hazard profile.
Resolution 1045 adopting Parks and Recreation Master Plan	Regulations	Kyle passed a resolution to update the 2006 Parks and Recreation Master Plan on December 6, 2016. (City of Kyle, Texas, 2016).
2016 Kyle Parks and Recreation Master Plan	Plan	<p>Consideration of plan goals and actions:</p> <ul style="list-style-type: none"> • Relevance of Parks: 6. ...can control stormwater runoff and reduce flooding...parks and greenbelts often represent a community's greatest efforts in open space conservation or preservation. • Goal 3.3 Plan for greenway corridors and nature trails along the Blanco River as feasible. • Goal 3.4 Preserve and utilize drainage, utility and natural creek corridors as primary potential linkage corridors throughout the City. • Goal 4.5 Continue to establish policies and methods to preserve needed floodway and drainage ways throughout the City and keep them as valuable greenbelt corridors. • Goal 4.6 Establish policies that encourage private owners to preserve and protect key natural areas within the City. Incentivize set-asides of upland corridors. • Goal 8.2 Consider the use of native plant materials and xeriscape techniques where appropriate to reduce maintenance and irrigation costs in parks and on City properties. • Action III.1 Identify areas within the existing Kyle parks system for natural resource preservation. • Action III.2. Prepare and implement a prairie or woodland restoration plan for 1 or more of Kyle's park properties. • Action III.3 Incorporate tools in the City's land development ordinances which encourage natural resource preservation. • Action III.4 Acquire parcels for the assembly of interconnected greenways. • Action VII.2 clearly define open space types (Amend Chapter 41 Subdivision Regulations and Chapter 53 Zoning of the Code of Ordinances to provide clear distinctions between open space principally set-aside for utility purposes and active or passive recreation space). • Capital Improvement Action for Riparian Corridor Land Assembly for linear park development. <p>(Halff Associates, 2016)</p>

Table KY.3, Review/Incorporation of Sources, cont.

Name of Document	Type	How Incorporated
City of Kyle 5 Year Capital Improvements Plan- Fiscal Years 2016-20	Plan	<p>Consideration of inclusion of projects that are part of the CIP:</p> <ul style="list-style-type: none"> Project 1- Repairs to Historic Old City Hall building. Project 20- New Police Station (enhance with mitigation review prior to location selection). Project 24- Guadalupe-Blanco River Authority Flood Protection Study Phase 3-COMPLETED. Project 27- Stormwater Master Plan and CIP Planning- to provide an analysis of known problem areas where flooding occurs (actually Drainage Master Plan). Project 28- Repair/regrading of existing open City drainage ditches, repair/replacement of existing City storm drains, culvert pipes, and storm drain manholes. Include all monitoring, sampling, and testing associated with stormwater run off. Project 34- Water Improvements-Line Upgrades/Replacements- to provide necessary repairs, line replacements/improvements, upgrades of existing water distribution infrastructure needed to maintain adequate flow and pressure. Project 38- Quick Connect Power Ports- installation of fast connect couplings and associated wiring at water pump stations to allow rapid connection of emergency power generator to station, equipment and motors to provide more reliable service abilities during natural disasters or other emergencies where power has been disrupted. Project 40- Water Improvements- Old Hwy 81- 12 inch waterline- Construction of a new waterline that will connect 2 existing waterlines to provide adequate fire flows to an area. Project 41- Water Improvements- Pumphouse Rd/Melinda Rd- construction of new 8 inch waterline to be installed to eliminate an existing smaller undersized line that is at capacity and to provide fire protection where there is currently none. Project 42- Water Improvements- Stagecoach, Scott St, Opal St- Construction of new 12 inch waterline to eliminate and replace undersized line and add fire protection where there is currently none. Project 44- Monarch Water System Inter-Connect including SCADA - will provide a water inter-connect that may be utilized by either the City or Monarch during emergency situations to provide an additional source of supply during emergency conditions. Project 64- Engineering & Easement- Lehman Road-...Raise road approximately 15 feet at low water crossings minimizing road closures due to rising water. Project 66- Engineering & Easement- N. Burleson Street- reconstruction that will also provide drainage improvements needed to minimize flooding in downtown area. <p>(City of Kyle, 2016)</p>
City of Kyle Economic Development Strategic Plan	Plan	<p>Incorporate plan goals when considering mitigation actions</p> <ul style="list-style-type: none"> Encourage landowners/developers to work...in coordination with the City....to identify optimal land use allocations (Sustainable Development Initiative). <p>(Kyle Economic Development, 2015)</p>
Kyle Connected Transportation Master Plan 2040	Plan	<p>Reviewed but did not find obvious mitigation-related items.</p> <p>(Lockwood, Andrews & Newnam, 2016)</p>
City of Kyle Stormwater Management Plan	Plan	<p>Review for opportunities to enhance or include items:</p> <ul style="list-style-type: none"> BMP No. 2- Outreach material research, production, and distribution regarding stormwater public education. BMP No. 9- Stormwater education materials or lectures coordinated with school district (enhance with further mitigation instruction). <p>(City of Kyle, 2014)</p>
City of Kyle Emergency Safety Plan	Outreach Document	<p>Reviewed for enhancement and addition of other instructions/tips for other natural hazards.</p>





Section 2: Risk Assessment

City of Kyle Jurisdictional Hazards

This section contains Kyle’s hazard profiles for each natural hazard included in the Hays County HMP Update. Profiles include:

- Location - the area where the hazard is known to occur
- Previous Occurrences - a history of reported events for the hazard
- Significant Previous Occurrences (when applicable) - notable hazard events within the community
- Extent - the strength or magnitude of the hazard
- Probability - the likelihood of the hazard event occurring in the future
- Impact - the consequence or effect (or possible effect) of hazard events
- Vulnerability Summary - identification of structures, systems, populations or assets susceptible to loss or damage and how they are/could be impacted

Hazard descriptions and extent scales for hazard magnitudes are found in Chapter 2, the risk assessment portion of the main plan document.

When available, data specific to Kyle was used for hazard analysis. When no instances were reported specifically for the jurisdiction for regional hazards, County-wide data was applied.

State and national datasets were used to determine occurrence, extent, and the respective probabilities, rather than verbal testimonies, in an effort to retain data consistency. For some hazards, the National Oceanic and Atmospheric Administration (NOAA) Storm Events Database was used as the most comprehensive data available for hazards. The Storm Events Database does not always reflect the most recent totals for fatality, injury, and damage amounts for previous hazard occurrences. The Previous Occurrences paragraph identifies instances in which this may occur. Verbal testimony, when available, was integrated into impact or vulnerability summaries to account for updates in this data.

2.1 Hazard Profiles

Hazards profiled within the risk assessment include:

- Drought - Within Chapter 2, the Risk Assessment portion of main Plan document.
- Extreme Heat - Within Chapter 2, the Risk Assessment portion of main Plan document.
- Severe Winter Storms - Within Chapter 2, the Risk Assessment portion of main Plan document.
- Lightning - Within Chapter 2, the Risk Assessment portion of main Plan document.
- Hailstorms
- Windstorms
- Tornadoes
- Expansive Soils
- Floods
- Hurricanes/Tropical Storms
- Earthquakes
- Dam/Levee Failure
- Wildfires



Hailstorms

Hailstorms: Location

The entire extent of the City of Kyle is exposed to some degree of hail hazard. Since hail can occur at any location, hail events could be experienced anywhere within the jurisdiction.

Hailstorms: Previous Occurrences

According to the NOAA Storm Events Database, there were 7 documented hail events listed for the City of Kyle and 57 documented events listed for Hays County and its unincorporated jurisdictions from year 1967. While the NOAA Storm Events Database lists events since the year 1967 for the County, events were not documented per jurisdiction until 1993.

Hailstorms: Extent and Probability

The Tornado and Storm Research Organization (TORRO) created a hail extent index to measure hail called the Hailstorm Intensity Scale. According to the reported previous hail occurrences for the City, the maximum hail extent experienced was up to 1.75 in., or 44.45 mm. in diameter. This size corresponds to a TORRO Hailstorm Intensity Scale classification of “Destructive.” Refer to Chapter 2, the risk assessment portion of the main plan document, for TORRO hail extent scale descriptions.

Based on 7 reported events in 23 years, the City of Kyle can expect a hail event approximately once every 3 years (on average) in the future with hail up to 1.75 in., or 44.45 mm. in diameter, corresponding to a TORRO Hailstorm Intensity Scale classification of “Destructive.”

Hailstorms: Impact

Based on the maximum hail extent experienced (44.45 mm), the TORRO Hailstorm Intensity Scale indicates that impact can be expected to include any of the following:

- Varying degrees of damage to vegetation and crops
- Damage to plastic structures
- Varying degrees of damage to glass
- Paint and wood scored
- Vehicle bodywork damage
- Varying degrees of roof damage
- Varying degrees of risk of injuries
- Varying degrees of aircraft damage
- Brick walls pitted

Hailstorms: Vulnerability Summary

The roof types on several critical facility structures are susceptible to hail, such as Seton Medical Center, a Constable Precinct Office, the Kyle Correctional Facility, the Hays CISD Administration Building and several of the community schools. There is not a dedicated sheltering structure for protecting critical City equipment or vehicles.



Windstorms



Windstorms: Location

The entire extent of the City of Kyle is exposed to some degree of wind hazard. Since wind can occur at any location, wind events could be experienced anywhere within the jurisdiction.

Windstorms: Previous Occurrences

According to the NOAA Storm Events Database, there were 5 documented wind events listed for the City of Kyle and 38 documented events listed for Hays County and its unincorporated jurisdictions since the year 1974. While the NOAA Storm Events Database lists events since 1974 for the County, events were not documented per jurisdiction until 1994.

Windstorms Extent and Probability

Wind is measured by the Beaufort Wind Scale that relates wind speed to observed conditions on land and sea. According to the reported previous windstorm occurrences in the jurisdiction, the maximum wind extent experienced was 61 knots (Beaufort Wind Scale Classification: Violent Storm). Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of wind extent scales.

Based on 5 reported events in 22 years, the City of Kyle can expect a wind event of up to 61 knots, or 70.2 miles per hour, (Beaufort Wind Scale Classification: Violent Storm) approximately once every 4 years on average in the future.

Windstorms: Impact

City level data available from the Texas Department of Transportation's Crash Records Information System shows that between the years of 2010 and 2017, the City of Kyle experienced 3 crashes related to severe crosswind weather conditions (shown in KY.4). Injuries sustained from these crash events included 3 Non-Incapacitating Injuries and 3 Possible Injuries.

Table KY.4, Windstorms, Vehicle Accidents, Hays County

City	Fatality	Incapacitating Injury	Non-Incapacitating Injury	Possible Injury	Crash Year	Street Name	Surface Condition	Weather Condition
Kyle	0	0	1	1	2010	IH0035	Wet	Severe Crosswinds
Kyle	0	0	1	1	2010	IH0035	Wet	Severe Crosswinds
Kyle	0	0	1	1	2010	IH0035	Wet	Severe Crosswinds

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)

Structures can be damaged by flying debris and impact from winds, damaging rooftops and causing other structural damage. Manufactured homes are especially vulnerable to damage that high winds can cause, to include destruction in the most extreme event conditions.

Critical infrastructure, such as utility poles and street signals, could also be disrupted, impacting all residents in the affected area. Debris on the roadway can also cause obstruction for emergency responders' ability to provide services.





Windstorms: Vulnerability Summary

Kyle has previously experienced debris accumulation on roadways during past windstorm events. Such incidents could cause impact on the ability of public safety officials to respond to emergency calls. Outside of newly developed subdivisions, Kyle has mostly surface powerlines. Surface powerlines pose a vulnerability due to the impact on electricity to homes and businesses during windstorms that can damage lines and interrupt service. There are 8 primary manufactured home parks within Kyle, with up to 279 home sites per park. These structures are more vulnerable to damage from extreme wind events posing significant impact to those that occupy these homes as their primary residence and source of shelter.

Additionally, there are many sites of critical facilities and infrastructure that are located within the City and are not retrofitted to mitigate damages from extreme winds. These facilities include: Kyle Fire Departments, Kyle Police Department, Seton Medical Center - Hays, and Kyle City Hall. Damages sustained by an extreme wind event to these facilities could hinder the ability to provide crucial services needed by the community.



Tornadoes



Tornadoes: Location

The entire extent of the City of Kyle is exposed to some degree of tornado hazard. Since tornadoes can occur at any location, tornado events could be experienced anywhere within the jurisdiction.

Tornadoes: Previous Occurrences

According to the NOAA Storm Events Database, there were 3 documented tornado events listed for the City of Kyle and 16 documented events listed for Hays County since the year 1953. While the NOAA Storm Events Database lists events since 1953 for the County, events were not documented per jurisdiction until 1997. The events reported for the City of Kyle are listed in Table KY.5.

Fatality, injury and damage amounts are shown in Table KY.5, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table KY.5, Tornado Events, Hays County

Location	Date	Type	Extent	Fatalities	Injuries	Property Damage	Crop Damage
Kyle	5/27/1997	Tornado	F1	0	0	5,000.00	0.00
Kyle	11/15/2001	Tornado	F1	0	3	500,000.00	0.00
Kyle	11/15/2001	Tornado	F1	0	3	500,000.00	0.00
Total				0	6	\$1,005,000.00	\$0.00

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)

Tornadoes: Extent and Probability

Tornadoes are measured by severity on the Fujita and Enhanced Fujita Scales, with a range 0-6. According to the reported previous occurrences in the jurisdiction, the maximum tornado extent experienced was a category F1. Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of the Fujita (F) Scale and Operational Enhanced Fujita (EF) Scale.

Based on 3 reported events in 19 years, the City of Kyle can expect a tornado event approximately once every 6 years (on average) in the future, with up to an F1 magnitude.

Tornadoes: Impact

Tornadoes in the City of Kyle could impact roadways due to the large amount of vegetation and other objects that could debris in the event of the high winds that accompany a funnel cloud. This debris could also cause physical harm to residents who may be outside during such an event. The wind speeds and debris caused by tornadoes can impact all residents in the community.

Based on Kyle having experienced tornadoes at F1 levels in the past, if similar events were to happen in the future in the City, the type of impacts that the jurisdiction can expect associated with that magnitude would include, from least to greatest:

- Light Damage- Broken branches; shallow rooted trees pushed over; some chimney damage.
- Moderate Damage- Surface damage to roofs; mobile homes pushed off foundation; moving vehicles pushed off the road.

(Tornado Facts, 2016)





Structures can be damaged by flying debris and impact from tornado winds, damaging rooftops and causing other structural damage. Manufactured homes are especially vulnerable to damage that tornadoes can cause, to include destruction in higher magnitude events.

Critical infrastructure, such as utility poles and street signals, could also be disrupted, impacting all residents in the affected area. Debris on the roadway can also cause obstruction for emergency responders' ability to provide services.

Tornadoes: Vulnerability Summary

Kyle has previously experienced debris accumulation on roadways during past windstorm events, posing a vulnerability as tornado events are accompanied by powerful winds. Such incidents could cause impact on the ability of public safety officials to respond to emergency calls. Outside of newly developed subdivisions, Kyle has mostly surface powerlines. Surface powerlines pose a vulnerability due to the impact on electricity to homes and businesses during tornado events that can damage lines and interrupt service. There are 8 primary manufactured home parks within Kyle, with up to 279 home sites per park. These structures are more vulnerable to damage from tornadoes posing significant impact to those that occupy these homes as their primary residence and source of shelter.

Additionally, there are many sites of critical facilities and infrastructure that are located within the City and are not retrofitted to mitigate damages from the extreme winds that accompany tornado events. These facilities include: Kyle Fire Departments, Kyle Police Department, Seton Medical Center - Hays, and Kyle City Hall. Damages sustained by a tornado event to these facilities could hinder the ability to provide crucial services needed by the community.





Expansive Soils

Expansive Soils: Location

According to the USGS Expansive Soils Regions, Figure 2.3 in Chapter 2 (the risk assessment portion of the main plan document), a small area on the western side of the City is less than 50% underlain with soils with clay textures that have high shrink-swell properties. The majority of the jurisdiction east of that area is over 50% underlain with soils with abundant clays with high swelling potential and is the area with the highest expansive soil potential within the jurisdiction.

Expansive Soils: Previous Occurrences

There was no documentation of past site-specific events of structural damage due to expansive soils from local, State, or national databases queried.

Expansive soils cannot be documented as a time-specific event, except when they lead to structural and infrastructure damage. There are no specific damage reports or historical records of events in the City, however future events can occur.

Expansive Soils: Extent and Probability

Considering the amount of swelling potential within the jurisdiction, and the lack of reported events, the probability of a future event is low (0 - 1 occurrences in the next 10 years affecting less than 5 structures).

Expansive Soils: Impact

Several residential structures within the community have experienced minor undocumented foundation problems that could possibly be attributed to the presence of expansive soils. Impact will increase with natural conditions that exacerbate soil swelling, leading to deeper and longer cracking to structures and terrain.

Expansive Soils: Vulnerability Summary

Although the City of Kyle is rapidly becoming a community made up of mostly newer residential structures (77% of existing dwelling units in Kyle were built since 2000), there is still a portion (23%) of the community in which the structures were constructed before the National Building Codes were adopted with specific codes for foundation work. As time progresses and the structures continue to age, the number of foundation issues could begin to emerge. A general lack of knowledge and concern from the public for the hazard creates a vulnerability due to a resulting lack of individual-level (homeowner) mitigation action for expansive soils.



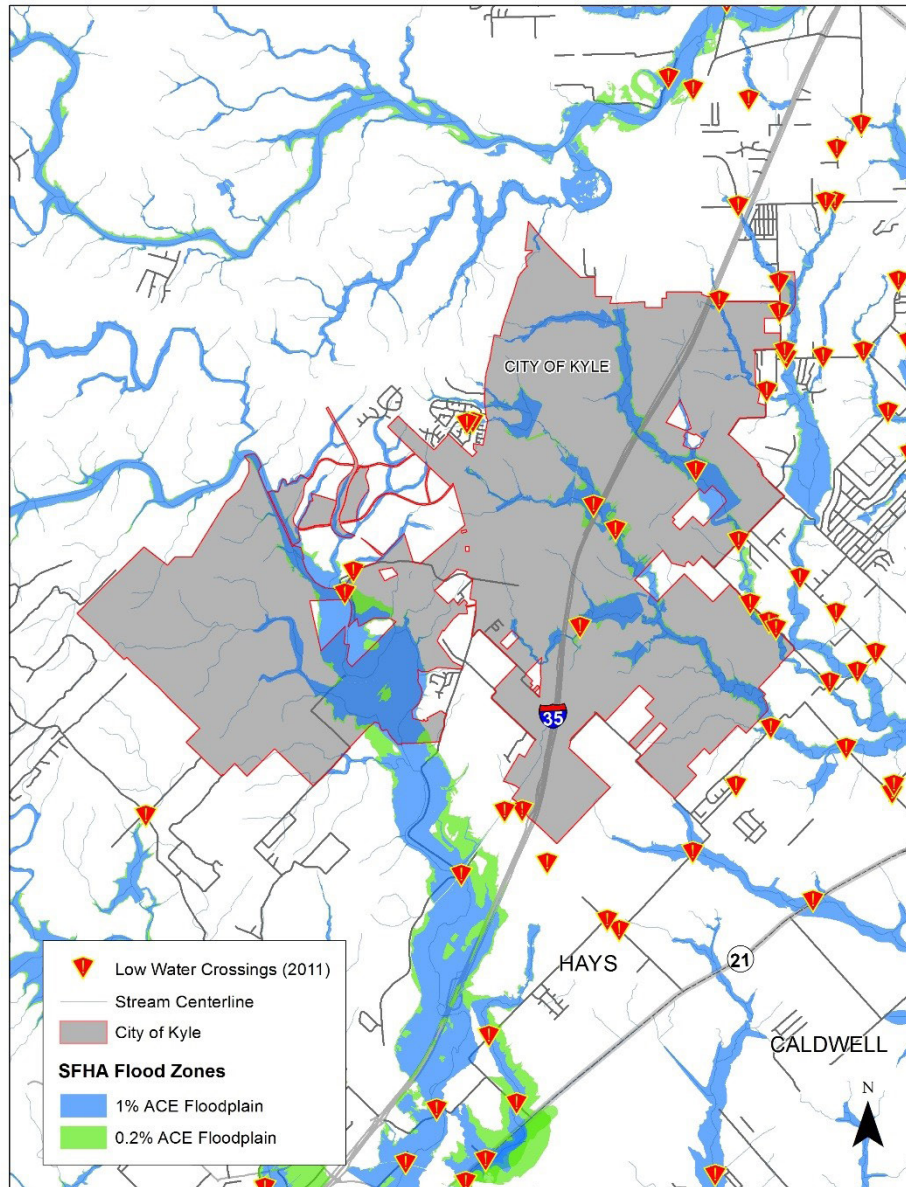


Floods

Floods: Location

The location of low water crossings, as well as the 1% (100-year) and 0.2% (500-year) Annual Chance Event (ACE) floodplains for the City of Kyle are shown in Figure KY.3. This figure represents the areas most affected by riverine flooding and is based upon newly developed hydrologic and hydraulic analysis. This analysis is considered the best information available to date. Table KY.3 provides the total acreage in the jurisdiction that is located in the 1% and 0.2% floodplains.

Figure KY.3, Special Flood Hazard Areas and Low Water Crossings, City of Kyle



(Texas Natural Resources Information System, 2011)



Table KY.6, City of Kyle Floodplain Acreage

Jurisdiction	100yr (1%) Floodplain Acres (Includes Floodway)	500yr (0.2%) Floodplain Acres (Includes 100yr)
City of Kyle	2,470	2,819



Floods: Previous Occurrences

The County received 3 disaster declarations for flooding since October of 2013. According to the NOAA Storm Events Database, there were 7 documented flood events listed for the City of Kyle and 54 documented events listed for Hays County from year 1997. While the NOAA Storm Events Database lists events since 1997 for the County, events were not documented per jurisdiction until 2004. The flood events reported for the City of Kyle are shown in Table KY.7.

Fatality, injury and damage amounts are shown in Table KY.7, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table KY.7, Flood Events, City of Kyle

Location	Date	Type	Fatalities	Injuries	Property Damage	Crop Damage
Kyle	1/13/2007	Flash Flood	0	0	0.00	0.00
Kyle	6/20/2007	Flash Flood	0	0	0.00	0.00
Kyle	7/25/2007	Flash Flood	0	0	0.00	0.00
Kyle	6/9/2010	Flash Flood	0	0	0.00	0.00
Kyle	5/24/2015	Flash Flood	0	0	100,000.00	0.00
Kyle	10/30/2015	Flash Flood	0	0	0.00	0.00
Kyle	10/30/2015	Flash Flood	0	0	0.00	0.00
Totals			0	0	\$100,000,000.00	\$0.00

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)

Floods: Significant Past Events

According to NOAA Storm Events Database, in October of 2013 (Disaster 4159-DR), thunderstorms produced heavy rain that led to flash flooding in Wimberley, San Marcos, Buda, and Kyle. Public reports of 14 inches of rain fell near Wimberley and this rainfall made its way into the Blanco River watershed and the Onion Creek watershed. Rainfall totals near Buda and Kyle were upwards of 8-10 inches. The Blanco River USGS gage at Kyle crested at 35.92 feet. Reports indicate that the Blanco River was near or slightly higher than the 1998 flood of record. The Blanco River was 100 feet out of its banks. In many areas along the Blanco River, debris was found 15 to 20 feet up. Several roads needed repair and several homes were flooded out. Across Hays County, 47 homes sustained minor damage, 24 sustained major damage, and 1 home was destroyed. There were also 4 businesses that sustained major damage.

According to NOAA Storm Events Database, in May of 2015 (Disaster 4223-DR), thunderstorms produced heavy rain that caused flash flooding in Kyle and San Marcos. The majority of the flooding was along the Blanco and San Marcos Rivers. A massive flood wave came down the Blanco River from Wimberley. Huge amounts of debris came with the flood waters. All along the Blanco River in Hays County, 1,515 structures were impacted with 321 houses destroyed and an additional 376 receiving major damage according to assessments. According to the Office of Emergency Services, FEMA awarded over 3.5 million dollars in public assistance to Hays County in response to this disaster.

According to NOAA Storm Events Database, in October of 2015 (Disaster 4245-DR), thunderstorms produced heavy rain that caused flash flooding sending creeks feeding into the Blanco River out of their banks southwest of Kyle. Tremendous rainfall totals in excess of 5-10 inches fell across this area during the morning hours. River and creek flooding was extensive across Hays, Travis, Bastrop, Caldwell, and Comal Counties. Estimates of 2000 homes were flooded in or near the IH-35 corridor, many of them destroyed or sustained major damage.





Floods: Extent

Flood extent is described through a combination of ground elevation, river heights, 100-year Water Surface Elevations (WSE's), and HAZUS depth grids. An example of flooding within the City are areas along the Blanco River as these are exposed to the greatest extent of an event. These areas have an approximate overbank ground elevation of 660 feet with an intersecting 100-year WSE of 662.5 feet. For a 100-year event, water depth of approximately 2.5 feet can be expected within this area. A further analysis of the Blanco River is described below.

With the Blanco River having an approximate in-channel elevation of 625 feet (per Light Detection and Ranging [LiDAR] data and USGS gauge data) and an intersecting WSE of approximately of 662.5 feet, flood depths would be 37.5 feet.

Floods: Probability

Probability has been calculated on the basis of NOAA reported events, as a standard, consistent calculation method for all hazards profiled with the Hays County HMP. Based on 7 reported events in 12 years, a flood event occurs approximately 2 times per year on average in Kyle. The City can expect a flood event approximately once every 2 years on average in the future, up to 37.5 feet.

Floods: Impact

The following describes the inventory counts and building replacement values for the jurisdictional area.

Kyle Building Counts			
Residential	Commercial	Other	Total
8,975	127	85	9,187

Kyle Building Replacement Value		
Building (\$)	Content (\$)	Total (\$)
2,481,513,426	1,290,672,254	3,772,185,681

A Probabilistic 100-year Return Period HAZUS-MH 3.2 analysis was run on the participating community. HAZUS results are calculated to census blocks. This analysis utilized the best available LiDAR (COA 2012 and CAPCOG 2008) and depth grids. The following describes the inventory counts and building replacement values for the jurisdictional area. These blocks were then intersected with the City to run a weighted area analysis to get jurisdictional results. The following paragraphs describe results from the 100-year Return (1% Annual Chance Event) weighted area analysis.

HAZUS-MH Results

General Building Stock Damage

HAZUS estimates that 103 buildings will be at least moderately damaged in the City of Kyle. 'At least moderately damaged' is defined by HAZUS as greater than 10% damage to a building. For this scenario, only residential buildings were at least moderately damaged.

Residential Buildings	Commercial Buildings	Other Buildings	Total Buildings
103	0	0	103





Building-Related Losses

Exposed Value is the total building and content values for structures within the community. The exposed value for the community is \$3,772,185,681. The total building-related losses were \$23,503,072 for this scenario. This represents 0.6% of the total replacement value of the community. Loss values are divided into building and content loss dollars.

Building Loss (\$)	Content Loss (\$)	Total Loss (\$)
14,666,526	8,836,545	23,503,072

Essential Facility Damage

HAZUS does not estimate any critical facilities or infrastructure interruption for more than 1 day. The model estimates that 100% of community hospital beds would be available for use by patients already in the hospital and for those injured by an event.

Debris Generation

HAZUS estimates the amount of debris that will be generated in this scenario. The model estimates that a total of 3,053 tons of debris will be generated. If the building debris tonnage is converted to an estimated number of truckloads, it will require 122 truckloads (with 1 to 25 tons per truck) to remove the building debris generated in this scenario.

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS also estimates the number of people displaced that will require accommodations in temporary public shelters. The model estimates 302 people will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 285 people will seek temporary shelter in public shelters.

Floods: Vulnerability Summary

The Kyle Master Parks and Recreation Plan states that, “Even though the Blanco River and its tributaries flow through Kyle, only small portions of the City are actually located within the 100-year floodplain. However, over the past 2 decades, many residential developments have started to encroach on the River’s tributaries and Plum Creek specifically. The City’s Comprehensive Plan recommends that lands surrounding waterways should be regulated and growth should be managed, stating that the waterways and associated floodplains provide excellent opportunities to consolidate a network of preserved natural lands linked by greenbelt corridors.

As the community continues to grow and the impervious surfaces continue to increase, the effects could result in adverse impact to other properties or areas if not mitigated properly.

National Flood Insurance Program Repetitive Loss

The City of Kyle is a current participant in the National Flood Insurance Program (NFIP). As of September of 2016, the City does not have any listed Repetitive Loss (RL) or Severe Repetitive Loss (SRL) properties according to FEMA RL/SRL data.



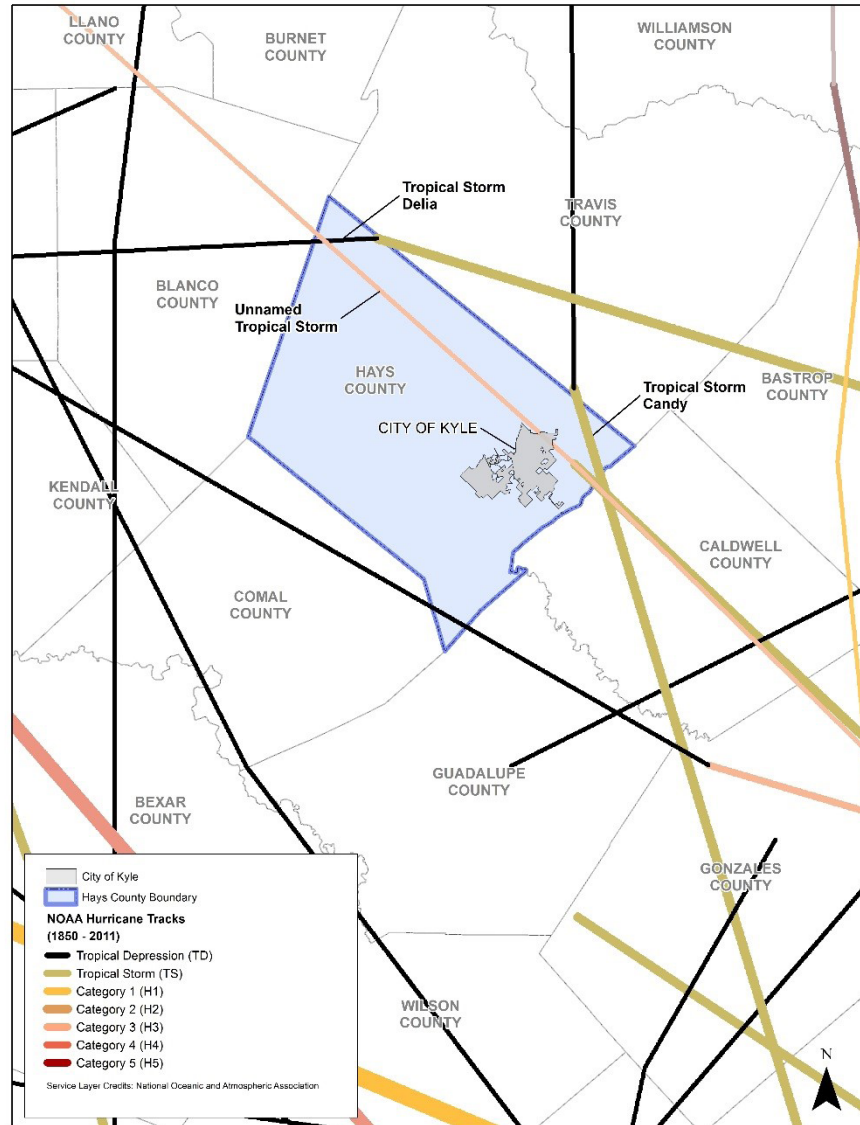


Hurricanes/Tropical Storms

Hurricanes/Tropical Storms: Location

Due to the regional nature of a hurricane or tropical storm event, the entire extent of the City of Kyle is equally exposed to a hurricane or tropical storm. Figure KY.4 illustrates the location of the jurisdiction with historical hurricane and tropical storm paths documented by NOAA's Hurricane Tracker from 1850 to 2011.

Figure KY.4, Historical Hurricane/Tropical Storm Paths, City of Kyle



(National Oceanic and Atmospheric Administration, 2016)



Hurricanes/Tropical Storms: Previous Occurrences

Previous events are described below based on NOAA Storm Events Database for Tropical Storm Hermine and NOAA Hurricane Tracker for all other events. By the time most hurricanes reach the County, they are tropical storms, depressions or thunderstorms. Because hurricane and tropical storm events occur on a regional scale, all events listed for Hays County have been included, as they would impact the City of Kyle.

July 13 to July 22, 1909 – An unnamed storm made landfall near Freeport, as a Category 3 Hurricane. This storm impacted Hays County and participating communities as a tropical depression with wind speeds up to 30 knots. No significant damages, injuries, or fatalities were reported for the City.



June 22 to June 26, 1968 – Tropical Storm Candy made landfall near Port Aransas. This storm impacted Hays County and participating communities as a tropical storm with wind speeds slowing to 30 knots as a tropical depression just after leaving the County. No significant damages, injuries, or fatalities were reported for the planning area.

September 1 to September 7, 1973 – Tropical Storm Delia made landfall near the border of Brazoria and Matagorda Counties. This storm impacted Hays County and participating communities as a tropical storm with wind speeds slowing to 30 knots as a tropical depression just after leaving the County. No significant damages, injuries, or fatalities were reported for the HMP update area.

September 6 to September 8, 2010 – According to the NOAA Storm Events Database, Tropical Storm Hermine made landfall near the Texas/Mexico border on the night of September 6. South Central Texas was hit very hard with widespread rains of 8-12 inches across much of the IH-35 corridor from Austin down to San Antonio.

Hurricanes/Tropical Storms: Extent and Probability

The Saffir-Simpson Scale measures pressure, wind speed, and storm surge in 5 categories. According to the reported previous hurricane occurrences in the jurisdiction, the maximum hurricane extent experienced was categorized as a tropical storm. Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of storm extents.

Based on 4 reported events in 107 years, a hurricane or tropical storm event occurs approximately every 27 years on average in Hays County. Since hurricane and tropical storm events can happen anywhere throughout the HMP update area, the City of Kyle's future probability is assumed to be similar to the surrounding County areas. In the future, the City can expect an event approximately once every 27 years on average, of up to a magnitude of a tropical storm at a 100-yr Max Wind Speed of 76 mph based on historical extents and HAZUS analysis.

Hurricanes/Tropical Storms: Impact

A Probabilistic 100-year Return Period HAZUS-MH 3.2 analysis was run on for Kyle. The following describes the results of this analysis.

HAZUS-MH Results

General Building Stock Damage

The total property damage losses were \$2,965,009. The majority of damage can be expected to impact residential areas (98%). The remaining damages (2%) are for commercial, industrial, agricultural and religious buildings. While some building damage is experienced, it is estimated that no buildings will be completely destroyed or experience severe damage. Exposed Value is the total building and content values for structures within the community. Loss values are divided separately for building and content loss in dollars.

Exposed Value (\$) (Building + Content)	Building Loss (\$)	Content Loss (\$)	Total Loss (\$)
3,772,185,681	2,965,009	1,401	2,966,410





Essential Facility Damage

HAZUS does not estimate any critical facilities or infrastructure to be interrupted for more than 1 day on the day of the event. The model estimates that 100% of available hospital beds would be available for use by patients already in the hospital and for those injured by the hurricane.

Debris Generation

HAZUS estimates the amount of debris that will be generated by the hurricane at a total of 11 tons. Of the total amount, brick/wood comprises 100% of the total. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckload (with 1 to 25 tons per truck) to remove the building debris generated by the hurricane.

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of people displaced that will require accommodations in temporary public shelters. The model estimates no households to be displaced due to the hurricane. While there is an estimation of over \$2.9 million in property damages expected, it is aforementioned that “no buildings would be completely destroyed or experience severe damage.” Residents would likely remain in their homes as damages were repaired, therefore no temporary shelter is needed.

Hurricane/Tropical Storms: Vulnerability Summary

Similar to the impacts of Windstorms, Hailstorms and Lightning, Kyle can expect to be impacted with debris and possible utility interruptions of critical infrastructure. In addition, the community’s proximity to IH-35 could lead to traffic delays caused by major evacuation efforts if the highway is used as an evacuation route for coastal residents.



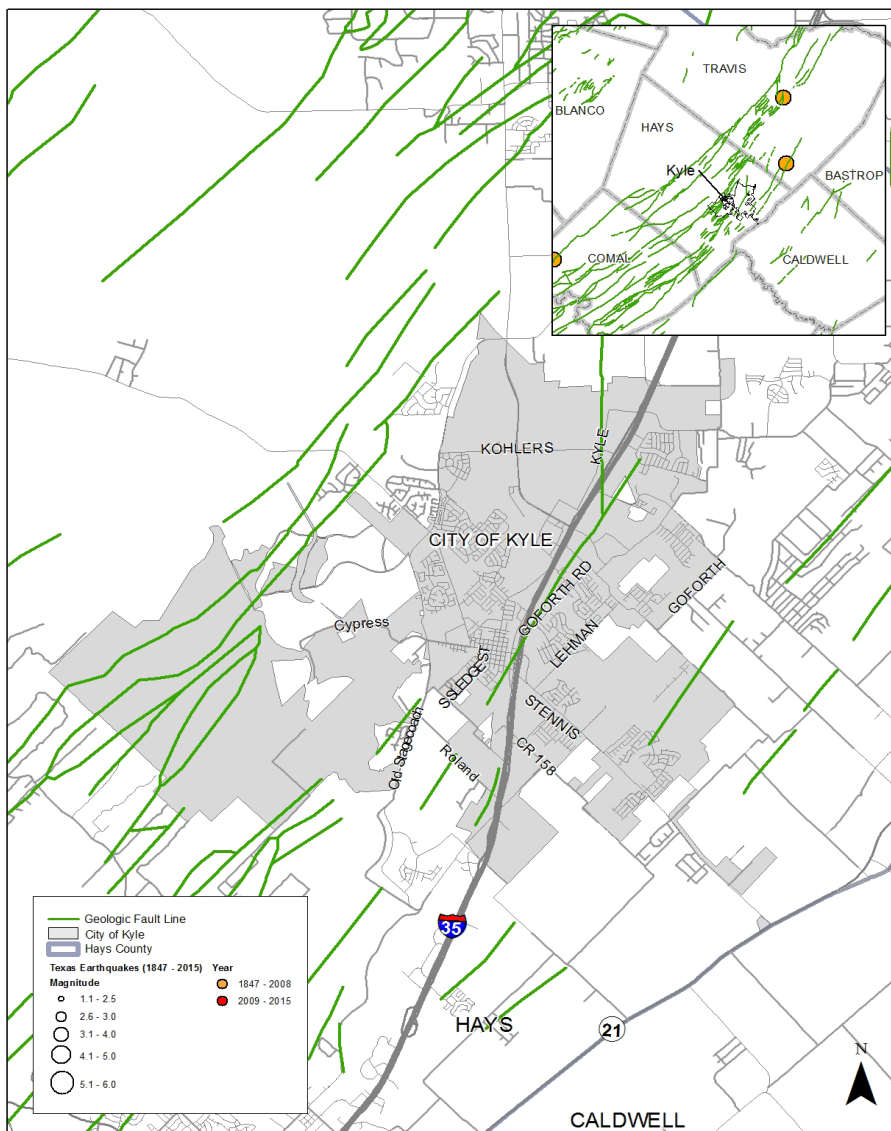


Earthquakes

Earthquakes: Location

Locations within proximity to fault lines are typically the areas most at risk for earthquakes. Figure KY.5 shows USGS documented fault lines and the locations of earthquakes from 1847 to 2015 in relation to the City of Kyle.

Figure KY.5, Texas Earthquakes, 1847 – 2015, City of Kyle



(USGS Earthquake Hazard Program, 2015)

Earthquakes: Previous Occurrences

According to USGS 1847-2015 data, there have been no documented earthquake events for the City of Kyle as illustrated in Figure KY.5.





Earthquakes: Extent and Probability

Earthquakes are measured by Peak Ground Acceleration (PGA). The HAZUS Max PGA for the jurisdiction is 1.59% (see City of Kyle Earthquakes: Impact Section for a description of the HAZUS analysis). This corresponds to the Modified Mercalli Scale Category IV, with light perceived shaking and no potential structure damage. HAZUS measures PGA on a census tract level. Cities within more than 1 census tract were assigned the highest PGA level to reflect the maximum possible extent. Refer to Chapter 2, the risk assessment portion of the main plan document, for extent scale and PGA descriptions.

As there have been no recorded previous occurrences of earthquakes for the City of Kyle and the PGA is less than 2% for the area, the probability of an earthquake in the City in the future is low (0 - 1 occurrences in the next 10 years, at up to a 500-yr PGA of 1.58%).

Earthquakes: Impact

The FEMA How-To Guidance, Understanding Your Risks (FEMA 386-2, page 1-7), suggests the earthquake hazard should be profiled if the PGA is greater than 3%g, where PGA is measured in the acceleration of gravity (g). The City's PGA is less than 3%g (0.03) and there have been no recorded earthquakes in or near the jurisdiction. Therefore, only a minimum level-1 HAZUS analysis was profiled using the 500-year probability event scenario. The HAZUS analysis produced a PGA of 1.58%. HAZUS scenario would produce \$0 in building damages (Residential, Commercial, Agriculture, Religious and Government) from an event. Critical facilities and infrastructure would not experience any loss of service. There would be no critical facilities or infrastructure that would experience moderate to complete damage. No debris would be generated from this event and no people or households would require temporary housing. There would be no moderate, extensive or completely damaged buildings by this event. HAZUS estimates no residents are expected to be displaced from their homes or will require accommodations in temporary public shelters due to the simulated earthquake. Additionally, there would be no casualties or fatalities from this event.

Earthquakes: Vulnerability Summary

While the probability of an earthquake in Kyle is low, with no significant prior events on file, there are fault lines within the community that could cause impact if there were to be an increase in seismic activity in the area. There are 13 fault lines located within the jurisdiction according to USGS data. Kyle could expect to be impacted with debris and possible utility interruptions if an event were to occur in an unlikely and unprecedented scenario exceeding the 500-yr probability event scenario run in HAZUS. If an event of this magnitude were to incapacitate a roadway, emergency responders would be hindered from responding, leaving the residents at risk.

The following thoroughfares are crossed by the USGS fault lines displayed on Figure KY.5: IH-35, Post Road, Kohlers Crossing, East Post Road, Elmhurst Drive, Kyle Center Drive, and Goforth Road.

Additionally, the following critical facilities, infrastructure and other non-critical public facilities are located within 1 mile of a fault line within the community (according to HAZUS and community submitted critical facility data): Seton Medical Center, Constable Precinct #2, Health Department, Kyle Correctional Center, Wallace Middle School, Hays CISD Special Education, Kyle Elementary School, Fuentes Elementary School, and Hays CISD Administration.



Pages 22, 23, and 24 Dam/Levee Failure have been redacted from this copy of the plan.



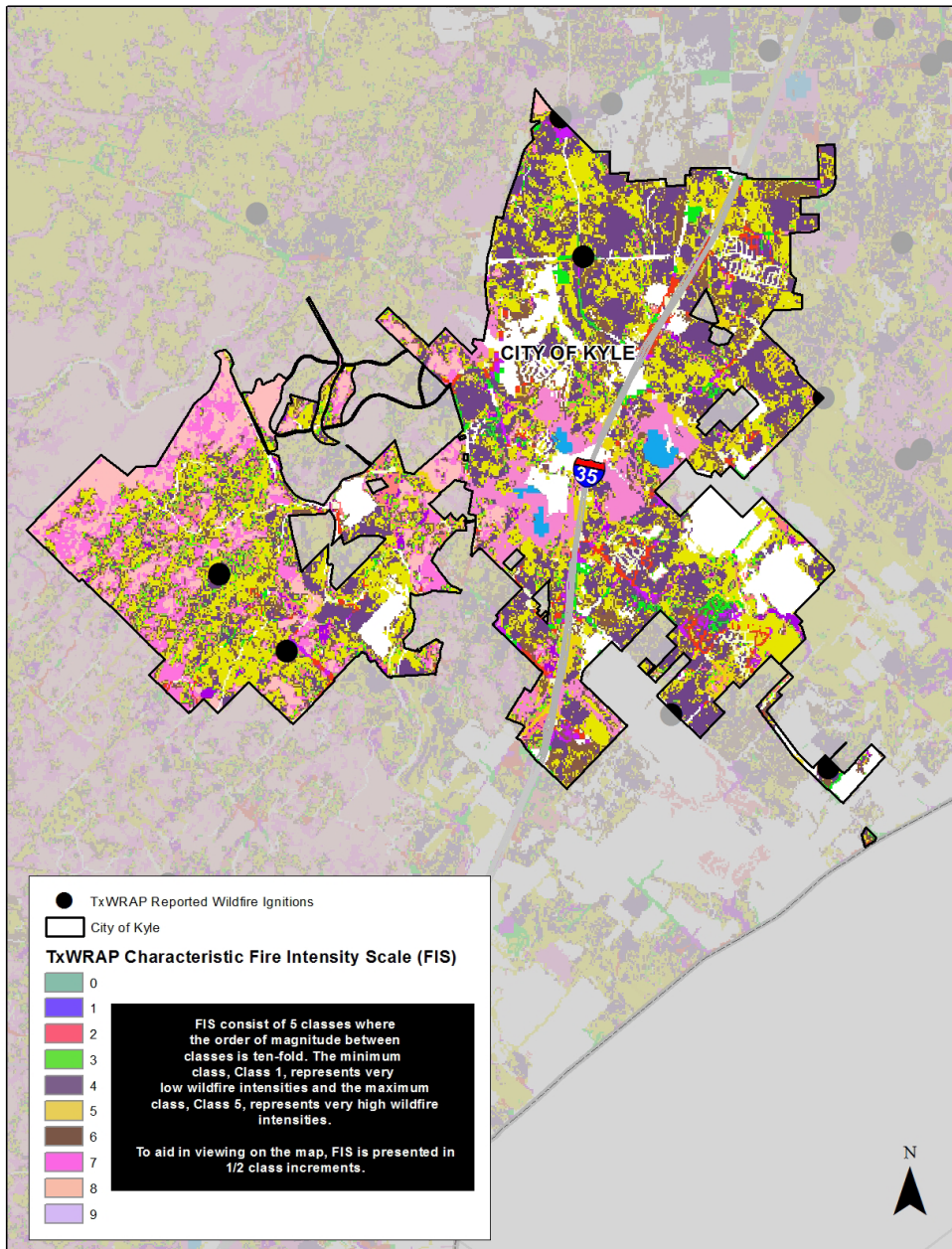


Wildfires

Wildfires: Location

Wildfires can be ignited from a variety of sources including lightning or human activity such as campfires, smoking, arson, or equipment use. The Texas A&M Forest Service's Texas Wildfire Risk Assessment Portal (TxWRAP) can be used to help communities understand their wildfire risk. Figure KY.7 below shows the location of TxWRAP's documented wildfire occurrences with Fire Intensity Scale (FIS) classifications within the City of Kyle. TxWRAP identifies FIS areas as those where wildfire fuels and associated potential dangerous fire behavior exist, based on a weighted average of 4 percentile weather categories.

Figure KY.7, Fire Intensity Scale (FIS) and Reported Wildfire Ignitions, City of Kyle



(Texas A&M Forest Service, 2016)



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Wildfires: Previous Occurrences

Table KY.9 shows the reported wildfire ignitions within the City of Kyle, according to TxWRAP and USGS Federal Fire Occurrence data from the years 1980 to 2015.

Table KY.9, Wildfire Ignitions, City of Kyle

FPA ID	Date	Fire Size (Acres)
SFO-TX02240706-42835	4/1/2006	200
SFO-TX0482-115401	1/5/2008	27
SFO-TX0482-154378	4/18/2008	0.5
NA	NA	10

NA - Data not available

Wildfires: Extent and Probability

Table KY.10 lists the Fire Intensity Acreage for the City, according to the Texas A&M Forest Service TxWRAP Community Summary Report. Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of the FIS.

Table KY.10, TxWRAP Fire Intensity Acreage, City of Kyle

Class	Acres	Percent
Non-Burnable	4,153	34.60%
1 (Very Low)	147	1.20%
1.5	346	2.90%
2 (Low)	144	1.20%
2.5	3,425	28.50%
3 (Moderate)	2,394	19.90%
3.5	1,201	10.00%
4 (High)	80	0.70%
4.5	115	1.00%
5 (Very High)	0	0.00%
Total	12,004	100.00%

Based on 4 reported events in 35 years, the City of Kyle's future probability for a wildfire event is approximately once every 8 to 9 years (on average), with up to a potential fire intensity of 4.5, or "High" classification on the TxWRAP FIS.





Wildfires: Impact

Impact on the community can be measured using TxWRAP Housing Density levels within the WUI. Areas with a higher housing and population density would be affected to a greater extent than rural areas, especially in areas near burnable fuels. In the event of a wildfire in high density areas of population, residential structures would be damaged or destroyed, critical infrastructure such as water, sewer and electrical services would be interrupted and residents would experience injury or loss of life. Table KY.11 below lists the population, percent of total population,

WUI acreage and percent of WUI acreage for the City of Kyle, according to the Texas A&M Forest Service TxWRAP Community Summary Report.

Table KY.11, WUI Acreage, City of Kyle

Housing Density	WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
LT 1hs/40ac	40	0.50%	1,523	20.40%
1hs/40ac to 1hs/20ac	79	0.90%	954	12.80%
1hs/20ac to 1hs/10ac	156	1.80%	1,071	14.30%
1hs/10ac to 1hs/5ac	262	3.00%	1,056	14.10%
1hs/5ac to 1hs/2ac	789	9.00%	1,257	16.80%
1hs/2ac to 3hs/1ac	5,395	61.80%	1,463	19.60%
GT 3hs/1ac	2,008	23.00%	147	2.00%
Total	8,729	100.00%	7,471	100.00%



Wildfires: Vulnerability Summary

The City of Kyle has the unique benefit of having 2 Emergency Services District stations within its City limits. With most communities within the County being lucky to have 1 nearby or within their jurisdiction, they have access to services with fast response times. Interstate Highway 35 passing through the community does weigh on the emergency responder availability, as many accidents occurring within the County occur on this roadway. If a wildfire event was to occur, the responders located within the community (independent of City of Kyle control as they are standalone organizations) may need to seek backfill from other organizations to meet the demands of IH-35 while fighting a fire. The community has fire hydrants, however there are parts of the community that do not have adequate fire flow, according to the Capital Improvements Plan.

2.2 Risk Ranking Result

On January 12, 2017, members of the City of Kyle MPC completed a questionnaire as part of the Hays County HMP Update: Risk Assessment. The questions covered the risk associated with the hazards that affect the community based on the level of concern over each profiled hazard, the hazards' impact on health and safety, as well as impact to property and business continuity. The answers from this questionnaire were combined with public survey results on perception of risk. The values from both sources were analyzed using the Halff Risk Ranking Tool (details regarding the risk ranking tool are in Chapter 2, the risk assessment portion of the main plan document). The results provided a quantified ranking of risk, with values ranging from 0 to 100. The results for Kyle are shown below (hazard values are shown from highest to lowest risk):

Ranking Order	Hazard	Risk Ranking Value
1	Floods	94.7
2	Expansive Soils	87.3
3	Dam/Levee Failure	84.1
4	Extreme Heat	74.1
5	Severe Winter Storms	72.2
6	Wind Storms	71.9
7	Hail Storms	71.6
8	Lightning	57.3
9	Wildfire	51.7
10	Tornadoes	48.9
11	Drought	48.3
12	Earthquakes	46.1
13	Hurricanes/Tropical Storms	43.0
-	Land Subsidence	Not Profiled



Section 3: Mitigation Strategy

This section examines the jurisdiction’s ability to perform mitigation (a review of existing capabilities is shown in Table KY.12) and identifies specific actions to address vulnerabilities for each hazard profiled in the Hays County HMP Update. The mitigation strategy is the application of actions into an approach for performing structural and non-structural mitigation efforts within the jurisdiction. Actions are also prioritized and considered for incorporation into other community programs, regulations, projects or plans.

Completed and canceled actions are also included in a separate section for future reference.

3.1 Existing Capabilities

Table KY.12, Existing Capabilities

Capability Name	Capability Type	Ability to Expand/Improve
Chapter 211 of the Local Government Code: Zoning	Authority	Authorizes the City to regulate zoning. (State-level code)
Chapter 213 of the Local Government Code: Municipal Comprehensive Plans		Authorizes the City to adopt a comprehensive plan for the long-range development of the City. (State-level code)
Chapter 214 of the Local Government Code		Authorizes the City to have regulatory authority as it related to building code (such as structural integrity and plumbing). (State-level code)
City of Kyle Code of Ordinances Chapter 8: Building Regulations		Regulatory power over the construction of new structures. (Municode, 2017) Can be enhanced to include increased mitigation building best practices.
City of Kyle Code of Ordinances Chapter 17: Floods		Regulatory control over development in the floodplain and protection of SFHA’s. (Municode, 2017) Can be improved to include changes in floodplain, as new maps are adopted.
City of Kyle Code of Ordinances Chapter 20: Law Enforcement and Civil Emergencies		Regulation over actions for emergency communications and evacuations. (Municode, 2017) Can be used as a basis for the development of natural-hazard-specific guidance documents.
City of Kyle Code of Ordinances Chapter 23: Miscellaneous Offenses		Ability to enforce ordinances. (Municode, 2017) Can be used to increase enforcement capabilities against floodplain violations.
City of Kyle Code of Ordinances Chapter 41: Subdivisions		Regulation over subdivision development. (Municode, 2017) Can be enhanced through instituting mitigation standards for safe growth that encourage mitigation.
City of Kyle Code of Ordinances Chapter 44: Taxation		Regulation over the ability to tax to fund possible mitigation actions. (Municode, 2017) Storm water tax and other conveyance taxes can be considered to fund projects.
City of Kyle Code of Ordinances Chapter 50: Utilities		Regulation over the use and installation of utilities. (Municode, 2017) Safe growth practices can be added to ensure mitigation measures are considered.
City of Kyle Code of Ordinances Chapter 53: Zoning		Regulation over zoning within the community. (Municode, 2017) Member of MPC can be included in Planning and Zoning Committee.



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Table KY.12, Existing Capabilities, cont.

Capability Name	Capability Type	Ability to Expand/Improve
Mayor	Elected Official	Provides political support for approving and funding mitigation actions. Could attend mitigation information session to learn about community risks and mitigation strategy.
Council Members		Supplement political support for implementation of mitigation actions. Could attend mitigation information session to learn about community risks and mitigation strategy.
Emergency Management Coordinator	City Staff	Coordinates MPC, implementation of mitigation actions, and monitoring/evaluation/updating HMP. Attend future Hazard Mitigation Planning class offerings to maintain working knowledge of changes in planning standards and practices.
Floodplain Administrator	Various Engineers City Staff	Ensures enforcement of existing flood damage prevention ordinance, and continued compliance with NFIP requirements. Attend advanced floodplain management training.
Civil Engineer	City Staff	Provides expertise and guidance for structural mitigation actions. Attend advanced floodplain management training.
Chief Building Official		Collaborates with MPC on ensuring compliance with existing mitigation-related building requirements and consideration of new building practices to increase mitigation. Attend advanced floodplain management training.
Community Planner		Considers HMP-identified risk areas when consulting with community planning stakeholders. Participate in MPC.
GIS Coordinator		Can graphically demonstrate changes in development and changes in hazard areas. Track damage data geographically for future risk analysis.
Parks and Recreation Director		Assists in identifying opportunities for integration of mitigation activities into long-term park development plans. Can also assist with coordinating public outreach events.
Police Chief		Assists with flood-related traffic control and evacuation planning. Can participate in MPC as planner or stakeholder.
Fire Chief		Assists with wildfire-related mitigation through existing programs and efforts as well as implementation of new measures. Can participate in MPC as planner or stakeholder.
Sales Tax	Funding	Provides potential funding for hazard mitigation items.
Property Tax		Provides potential funding for hazard mitigation items.
Franchise Tax		Provides potential funding for hazard mitigation items.
Permitting and Licensing Fees		Provides potential funding for hazard mitigation items.
Capital Improvement Plan Funding		Budget dollars obligated to projects that involve multiple mitigation-related actions. Integrate HMP projects into plan.



3.2 National Flood Insurance Program Participation

The City of Kyle participates in the National Flood Insurance Program (NFIP). The City Building Official serves as the Floodplain Administrator. There are also 2 Certified Floodplain Managers on the Engineering Team staff who support the Floodplain Administrator. The enforcement of the City Flood Damage Prevention Ordinance consists of permit review, inspections and engineering services. Their Ordinance meets Federal and State minimum standards. The permitting process consists of the completion of a Flood Hazard Development permit by the applicant and the review of that document by City of Kyle Staff. The community does not participate in the Community Rating System program but can consider participation as they continue to regulate within the Special Flood Hazard Area (SFHA). The community is also working toward a higher standard of requiring one foot of freeboard above the Base Flood Elevation for any development within the SFHA. The City of Kyle has 100 NFIP policies in force as of June 2016, with \$22,498,400 of insurance coverage.

3.3 Mitigation Goals

The plan-level Mitigation Goals can be found in Chapter 3, the Mitigation Strategy portion of the Hays County HMP Update. These goals apply to each community and were mutually decided upon as the guiding goals for the development of actions in each jurisdiction.



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3.4 Mitigation Actions

*E= Actions reducing risk to existing buildings and infrastructure

*F= Actions reducing risk to new development and redevelopment

Number/Title	Hazard	Item Description	Implementation Agency	
1 Flood Insurance Information Campaign (previously action 1 on 2011 plan, modified)	Floods	Promote the flood insurance program to lessen the number of structures uninsured from flood loss by providing citizens access to brochures about the NFIP at the local City Hall and links to resources on website.	City of Kyle Stormwater, City of Kyle Communications	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing City staff/ in-kind services and free NFIP materials from FEMA publication warehouse		3 months	Not started	N/A
Cost and Benefit Considerations				
This project would indirectly benefit residents who need information about the hazard at little cost.				

Number/Title	Hazard	Item Description	Implementation Agency	
2 Adopt City Structural Engineering Design Manual (previously action 2 in 2011 plan, modified)	Floods, Expansive Soils	Enhancement of City Structural Engineering Design manual to include increased drainage criteria and expansive soil compaction. The Engineering Design Manual is the enforced standard for structural development in the City of Kyle.	City of Kyle City Council, City of Kyle Engineering	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing City staff/ in-kind services		12 months	Not Started	E/F
Cost and Benefit Considerations				
This project would be a low-cost method of ensuring that new development and substantial improvements are done with less risk for flood damage and expansive soils.				

Number/Title	Hazard	Item Description	Implementation Agency	
3 Attend Advanced Local Floodplain Management Courses (previous action 3 in 2011 plan, modified)	Floods	Send member of the staff or elected official to training in order to become a received advanced floodplain management training.	City of Kyle Engineering	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff / in-kind services, cost of accommodations for traveling to training		6 months/then ongoing	Not started	E/F
Cost and Benefit Considerations				
If attending the course at the Emergency Management Institute, the cost of the course would be very low, and only include a minimal meal ticket purchase. The benefit of an informed floodplain administrator would help both new and existing residents through guidance on how to mitigate flood damages to development.				



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Number/Title	Hazard	Item Description	Implementation Agency	
4 CodeRed Registration Drive (previously action 4 in 2011 plan)	Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Floods, Hurricanes/Tropical Storms, Earthquakes, Dam/Levee Failure, Wildfires	Marketing a registration drive to encourage those who live and work in the community to register their devices in the CodeRed database.	City of Kyle Stormwater, City of Kyle Communications	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff resources/ in-kind services		6 months	Not started	N/A
Cost and Benefit Considerations				
This low cost effort using existing outreach methods will increase the number of contacts on the CodeRed system and improve the span of reach for messages.				

Number/Title	Hazard	Item Description	Implementation Agency	
5 StormReady Designation for Kyle (previously action 6 in 2011 plan)	Windstorm, Hailstorm, Severe Winter Storms, Lightning, Hurricanes/Tropical Storms, Tornadoes, Floods	Application preparation and submission for StormReady designation from the National Weather Service that attests to the community's level of preparedness for severe weather.	City of Kyle Stormwater	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		12 months	Delayed	N/A
Cost and Benefit Considerations				
This free application would benefit all members of the community in increasing the preparedness of the local government.				

Number/Title	Hazard	Item Description	Implementation Agency	
6 Increase Public Awareness of Hazard Mitigation (previously action 9 in 2011 plan, modified)	Drought, Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Expansive Soils, Floods, Expansive Soils, Hurricanes/Tropical Storms, Earthquakes, Dam/Levee Failure, Wildfires	Increasing public awareness of natural hazards and hazardous areas; distributing public awareness information regarding hazards and potential mitigation measures. Promotional sources would include City website, social media and public education programs. Provide link to HaysInformed.com.	City of Kyle Communications Department	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		6 months	Ongoing	N/A
Cost and Benefit Considerations				
This free enhancement to the City's existing website would benefit all with internet access at little to no cost, except the staff resources required to do so.				



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Number/Title	Hazard	Item Description	Implementation Agency	
7 Installation of Generators for City Owned Facilities and Procedures for Providing Temporary Sheltering (previously action 7 in 2011 plan, modified)	Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Floods, Hurricanes/Tropical Storms, Earthquakes, Dam/Levee Failure, Wildfires	Back-up electrical power available to City structures to ensure continuity of government operations and to also provide temporary sheltering for vulnerable populations in the City.	City of Kyle City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services, grant writing assistance, Hazard Mitigation Grant program funding, if applicable and eligible		18 months	Not started	E
Cost and Benefit Considerations				
If grant funding is eligible, the cost/benefit of this project would have to be positive. Only the fire department stations have a back-up source for power and those belong to the Emergency Services District, not the City.				

Number/Title	Hazard	Item Description	Implementation Agency	
8 Adopt Firewise hazard information from Hays County for mitigation activities (previously action 10 in 2011 plan, modified)	Wildfires	Formal adoption of Hays County Firewise maps and data for purposes of mitigating against wildfire risk and planning activities.	ESD #5 Fire Marshall	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		6 months	Not started	E/F
Cost and Benefit Considerations				
Building upon an existing and funded County level project, the community can take action to adopt Wildfire maps and data at no cost.				

Number/Title	Hazard	Item Description	Implementation Agency	
9 Energy Prioritization Collaboration with Electric Cooperative (previously 13 in 2011 action plan, modified)	Extreme Heat, Severe Winter Storms, Lightning, Windstorms, Tornadoes, Hurricanes/Tropical Storms	Working with electricity providers to create a citizen registration system for requesting prioritization for power restoration according to special need or circumstance during hazards that could affect access to electricity. This could be done as an additional question added to the CodeRed registration.	City of Kyle Emergency Management	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services, Electric Companies		6 months	Not Started	N/A
Cost and Benefit Considerations				
This low cost project for prioritizing energy restoration for those with special needs within the community that would be impacted by hazards that are known for affecting impact to electrical power. All those with special needs from electrical resources would benefit.				



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Number/Title	Hazard	Item Description	Implementation Agency	
10 Street Prioritization Procedure for Sanding (previously action 14 in 2011 plan)	Severe Winter Weather	Creation of a plan that provides established procedures and prioritization for sanding efforts.	City of Kyle Public Works	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		12 months	Not Started	N/A
Cost and Benefit Considerations				
This low cost planning activity will ensure that careful consideration is made for road prioritization for sanding activities that will benefit many residents and visitors.				

Number/Title	Hazard	Item Description	Implementation Agency	
11 Coordination of Limb and Large Item Pick-up day for Wildfire Mitigation (previously action 15 in 2011 plan, modified)	Wildfire, Severe Winter Weather, Lightning	Cross marketing of existing brush collection efforts from new trash vendor in order to promote mitigation.	City of Kyle Stormwater, City of Kyle Communications	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services, trash provider		2 months	In Progress	N/A
Cost and Benefit Considerations				
At only the cost of the staff for coordination, the community cross-marketing new resources for collecting/ accepting brush in order to promote cleaning brush and dead trees to decrease fuel for wildfire, potential debris that could fall on power lines during freezing conditions and that could ignite during lightning strike. This would benefit any citizen that resides in a location with vegetation and trees. This will benefit the whole community.				

Number/Title	Hazard	Item Description	Implementation Agency	
12 Engineering review of New Police Department construction (CIP project) to ensure soundness against natural hazards (previously actions 16, 17 in 2011 plan, modified)	Flood, Tornadoes, Windstorm, Hurricanes/ Tropical Storms, Hailstorms	Contract with a firm to review the new Police Department building to ensure its resiliency.	City of Kyle Engineering	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services, cost of engineer study		12 months	Not started	E/F
Cost and Benefit Considerations				
The cost of this review will benefit the City government as it will assist with the assurance of the continuity of operations for the community during disaster conditions.				



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Number/Title	Hazard	Item Description	Implementation Agency	
13 Evacuation Plans/ Alternate road consideration (previously action 19 in 2011 plan, modified)	Hurricanes/ Tropical Storms, Floods, Dam/ Levee Failure, Wildfire	Documentation of an evacuation plan that includes multiple exits.	City of Kyle Stormwater, City of Kyle Emergency Management	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services, possible cost of buy out for an easement of land to develop an additional emergency exit for the community, pursuit of grant funding for effort		18 months	Not started	F
Cost and Benefit Considerations				
The cost of not establishing a way out of the community would greatly outweigh the cost of mitigating this risk of not being able to get citizens out of danger.				

Number/Title	Hazard	Item Description	Implementation Agency	
14 Expansive Soil Online Information Sheet	Expansive Soils	Creating and providing information regarding expansive soils to developers and citizens building in the community. The information about the hazard will provide recommendations for soil compaction and engineered foundations, especially for non- site built structures.	City of Kyle Stormwater	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services, website maintenance costs		3 months	Not started	E/F
Cost and Benefit Considerations				
This free effort would provide awareness and public information that will benefit those looking to perform new development and those who are improving or repairing existing property.				

Number/Title	Hazard	Item Description	Implementation Agency	
15 Plum Creek Dam Evacuation Plan Request (previously action 18 in 2011 plan, modified)	Dam/Levee Failure, Floods	Coordination dam owners to provide the City with disaster procedures and evacuation plans associated with dam failure.	City of Kyle Stormwater	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Cost covered by USACE, existing staff/ in-kind services		3 months	Not started	N/A
Cost and Benefit Considerations				
This request for information from dam owners would require very little effort from the community and would benefit all that are downstream of the structure.				

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Number/Title	Hazard	Item Description	Implementation Agency	
16 WaterWise Campaign (previously action 12 in 2011 plan, modified)	Drought	Promotion commercial for WaterWise Conservation Program for the City-enhancement to existing program.	City of Kyle Communications, City of Kyle Public Works	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Cost for commercial production, internal		9 months	Ongoing	N/A
Cost and Benefit Considerations				
Promoting this existing program will potentially improve water usage within the community.				

Number/Title	Hazard	Item Description	Implementation Agency	
17 Drought Monitoring Program (previously action 11 in 2011 plan, modified)	Drought	Provide widget on City homepage that provides the latest US Drought Monitor conditions for the day during drought conditions.	City of Kyle Communications, City of Kyle Public Works	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		6 months	Not started	N/A
Cost and Benefit Considerations				
This low cost monitoring and inclusion of drought water conservation measures will take more time than money to institute and could save the community from a water shortage. All residents that use the water source would benefit.				

Number/Title	Hazard	Item Description	Implementation Agency	
18 Riparian Zone Sign GIS Layer	Floods, Drought	Enhancement on existing Parks program item that placed riparian zone signs in areas where park land vegetation is left natural. Action would map the points of the sign placement using GIS.	City of Kyle GIS, City of Kyle Parks and Recreation Department	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		6 months	Ongoing	N/A
Cost and Benefit Considerations				
Being able to map assigned riparian locations would assist with better understanding where these zones are and benefit multiple programs involved in development within the City.				



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Number/Title	Hazard	Item Description	Implementation Agency	
19 Creation of Drainage Master Plan	Floods, Drought	Contracting of Drainage Master Plan for the community.	City of Kyle Engineering Department	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$200,000- general fund		18 months	Ongoing	E/F
Cost and Benefit Considerations				
This project is already an existing priority and has obligated funding.				

Number/Title	Hazard	Item Description	Implementation Agency	
20 Creation of Drainage Crew on City Staff	Floods, Drought	Drainage project construction crew being hired for implementation of drainage projects.	City of Kyle Public Works	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Annual cost of salary, vehicles and equipment for team		12 months	Ongoing	N/A
Cost and Benefit Considerations				
The creation of this team is an existing priority that is already funded and currently being implemented.				

Number/Title	Hazard	Item Description	Implementation Agency	
21 Water Improvements-Line Upgrades and Replacements (CIP 34)	Drought, Wildfires	An existing CIP project to provide necessary repairs, line replacements/improvements, upgrades of existing water distribution infrastructure. These are needed to maintain adequate flows and pressure to provide necessary compliance with TCEQ regulations.	City of Kyle Public Works	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$1,200,000 from Utility Fund phased over 4 years		48 months	Ongoing	E
Cost and Benefit Considerations				
This existing project is already a priority in the Capital Improvement Plan and has obligated funding.				

Hays County Hazard Mitigation Plan, City of Kyle Annex

Number/Title	Hazard	Item Description	Implementation Agency	
22 Water Improvements- Pumphouse Rd/ Melinda Lane Project (CIP 41)	Drought, Wildfires	The construction of a new 8" water line to be installed down Pumphouse Rd. that will eliminate an existing smaller undersized line that is currently at capacity. Project will also provide fire protection where there is currently none.	City of Kyle Public Works, City of Kyle Engineering	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$120,000 from Water Impact Fees		12 months	Ongoing	F
Cost and Benefit Considerations				
This existing project is already a priority in the Capital Improvement Plan and has obligated funding.				

Number/Title	Hazard	Item Description	Implementation Agency	
23 Quick Connect Power Ports (CIP 38)	Extreme Heat, Severe Winter Storms, Lightning, Windstorms, Tornadoes, Hurricanes/ Tropical Storms	Installation of fast connect couplings and associated wiring at water pump stations to allow rapid connection of emergency power generator to station, equipment and motors.	City of Kyle Public Works	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$40,000 from Utility Fund		12 months	Ongoing	E
Cost and Benefit Considerations				
This project will provide more reliable water service abilities during natural disasters or other critical emergencies where normal power has been disrupted is an existing Capital Improvement Plan project and has funding.				

Number/Title	Hazard	Item Description	Implementation Agency	
24 Water Improvements- Stagecoach, Scott Street, Opal Street	Floods, Drought, Wildfires	Phase I to a project that involves the construction of a new 12" water line along Stagecoach. This line is essential to eliminate an existing, small, undersized line that has already reached capacity. The new line will add fire protection where there currently is none.	City of Kyle Public Works and Engineering	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$185,000 from Water Impact Fees		12 months	Ongoing	E/F
Cost and Benefit Considerations				
To reduce cost, the project is proposed to be completed in-house by City staff and already is a project within the Capital Improvement Plan.				



Hays County Hazard Mitigation Plan, City of Kyle Annex

Number/Title	Hazard	Item Description	Implementation Agency	
25 Monarch Water System Inter-Connect using SCADA	Drought	This project will provide a water inter-connect that may be used by either the City or Monarch during emergency situations.	City of Kyle Public Works, Monarch Water	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Cost will be split between City and Monarch. \$70,000		12 months	Ongoing	E
Cost and Benefit Considerations				
This will provide an additional source of water during emergency situations and will benefit the entire population utilizing the water supply. This is an existing project in the Capital Improvement Plan.				

Number/Title	Hazard	Item Description	Implementation Agency	
26 Engineering & Easement of Lehman Road	Floods	This reconstruction to a 2 lane road with an additional turn lane and a bridge over Plum Creek will minimize road closures due to rising water.	City of Kyle Public Works, City of Kyle Engineering	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$7,895,448 from Road Bonds, phased over 24 months		24 months	Ongoing	E
Cost and Benefit Considerations				
Existing Capital Improvement Plan project with bond funding associated with it.				

Number/Title	Hazard	Item Description	Implementation Agency	
27 Engineering & Easement- N. Burleson Street	Floods	This reconstruction of a 2 lane roadway will include drainage improvements that will enhance land use in the area.	City of Kyle Public Works, City of Kyle Engineering	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$9,052,355 from Road bonds		36 months	Ongoing	E
Cost and Benefit Considerations				
Existing Capital Improvement Plan project with bond funding associated with it.				



Hays County Hazard Mitigation Plan, City of Kyle Annex

Number/Title	Hazard	Item Description	Implementation Agency	
28 Prepare and implement a prairie or woodland restoration plan for 1 or more of Kyle's park properties	Floods	Selection of a municipal park where all or a portion of the site may be restored to a natural grassland or woodland.	City of Kyle Parks	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Parks funding		36 months	Not started	E
Cost and Benefit Considerations				
Existing Parks Master Plan project with bond funding associated with it.				

Number/Title	Hazard	Item Description	Implementation Agency	
29 Acquire parcels for the assembly of interconnected greenways	Floods	For improved drainage and public recreation, this project also called a Riparian Corridor Land Assembly will be a project that interconnects greenways into a trail system that connects across Kyle.	City of Kyle Parks, Stormwater	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Parks Funding		36 months	Ongoing	E
Cost and Benefit Considerations				
Existing Parks Master Plan project with bond funding associated with it.				




Hays County Hazard Mitigation Plan, City of Kyle Annex

3.5 Capabilities Assessment

Evaluation/Prioritization of Actions

Each action added to the plan was developed using the Mitigation Action Summary Worksheet shown in Figure KY.8.

Figure KY.8, Mitigation Action Summary Worksheet



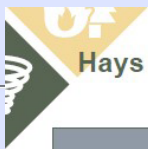
Hays County Hazard Mitigation Plan Update Process

Mitigation Action Summary Worksheet

Community Name:

Person completing questionnaire:

Mitigation Action/ Project Title	
Background/ Issue	
Opportunities for Integration	
Responsible Agency	
Partners	
Strategy for Existing Structures	



Hays County Hazard Mitigation Plan Update Process

Mitigation Action Summary Worksheet

Strategy for Future Development	
Potential Funding	
Cost Estimate (Values from "Measuring Costs" fields from Benefit and Cost Review Worksheet)	
Benefits (Statements from the "Difference" fields on the Benefit and Cost Review Worksheet)	
Timeline	
Priority (Based off Priority worksheet)	



Table KY.13, Mitigation Action Prioritization (with Hazards in order of highest priority to lowest)

Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community	Risk Ranking Score	Total Score
19. Creation of Drainage Master Plan	1	1	1	1	0	1	1	1	1	1	95	104
6. Increase Public Awareness of Hazard Mitigation	1	1	1	1	0	1	1	1	0	1	95	103
20. Creation of Drainage Crew on City Staff	1	1	1	1	0	0	1	1	1	1	95	103
26. Engineering & Easement of Lehman Road	1	0	1	1	1	0	1	1	1	1	95	103
13. Evacuation Plans/Alternate road consideration	1	0	1	1	1	0	1	1	0	1	95	102
18. Riparian Zone Sign GIS Layer	0	0	1	1	0	1	1	1	1	1	95	102
24. Water Improvements- Stagecoach, Scott Street, Opal Street	1	0	1	1	0	0	1	1	1	1	95	102
27. Engineering & Easement- N. Burleson Street	1	0	1	1	0	0	1	1	1	1	95	102
5. StormReady Designation for Kyle	1	0	1	1	0	0	1	1	0	1	95	101
21. Water Improvements- Line Upgrades and Replacements	0	0	1	1	0	0	1	1	1	1	95	101
22. Water Improvements- Pumphouse Rd/Melinda Lane Project	0	0	1	1	0	0	1	1	1	1	95	101
28. Prepare and implement a prairie or woodland restoration plan for 1 or more of Kyle's park properties	0	0	1	1	0	1	1	1	0	1	95	101
4. CodeRed Registration Drive	1	0	1	1	1	0	1	-1	0	1	95	100
1. Promote Flood Insurance in the community	0	0	1	1	0	0	1	1	0	0	95	99
15. Plum Creek Dam Evacuation Plan Request	1	0	1	1	0	0	1	-1	1	1	94	99
12. Engineering Review of New Police Department and Old City Hall to ensure soundness against natural hazards	1	1	1	-1	0	0	0	1	0	0	95	98
3. Advanced Floodplain Management Courses	0	1	1	0	0	1	-1	-1	0	1	95	97
2. Adopt City Engineering Manual with Drainage Incorporated	1	1	1	0	0	0	-1	-1	0	0	95	96



Hays County Hazard Mitigation Plan, City of Kyle Annex

Table KY.13, Mitigation Action Prioritization (with Hazards in order of highest priority to lowest) , cont.

Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community	Risk Ranking Score	Total Score
7. Installation of Generators for Old City Hall and Library and Procedures for Providing Temporary Sheltering	1	0	1	1	1	0	1	1	0	1	84	91
10. Street Prioritization Procedure for Sanding	1	0	1	1	1	0	1	-1	0	0	84	88
11. Coordination of Limb and Large Item Pick-up day for Wildfire Mitigation	1	1	1	1	1	1	-1	-1	0	0	84	88
9. Energy Prioritization Collaboration with Electric Cooperative	1	0	1	0	-1	0	1	1	0	0	84	87
23. Quick Connect Power Ports	1	0	1	1	0	1	1	1	1	1	72	80
25. Monarch Water System Inter-Connect using SCADA	0	0	1	1	1	1	1	1	1	1	72	80
17. Drought Monitoring Program	1	0	1	1	0	1	1	1	0	1	72	79
29. Acquire parcels for the assembly of interconnected greenways	0	0	1	1	0	1	1	1	1	0	72	78
16. WaterWise Campaign	0	0	1	1	0	1	1	-1	1	0	72	76
8. Adopt wildfire maps from Hays County Firewise project	1	1	1	1	0	1	1	1	1	1	49	58
14. Expansive Soil Information Sheet	0	1	1	-1	0	0	1	-1	0	0	48	49

Mitigation Actions by Hazard

The mitigation actions are shown with corresponding hazards in Table KY.14 below.

Table KY.14, Mitigation Action Impact, City of Kyle

Action Number	Drought	Extreme Heat	Severe Winter Storms	Lightning	Hailstorms	Windstorms	Tornadoes	Expansive Soils	Floods	Land Subsidence	Hurricanes/Tropical Storms	Earthquakes	Dam/Levee Failure	Wildfire
1									X					
2						X	X	X	X					
3									X					
4	X	X	X	X	X	X	X		X		X	X	X	X
5			X	X	X	X	X		X		X			
6	X	X	X	X	X	X	X	X	X		X	X	X	X
7		X	X	X	X	X	X		X		X	X	X	X
8	X													
9	X	X	X	X		X	X				X			
10			X											
11			X	X										X
12					X	X	X		X		X			
13									X		X		X	X
14								X						
15									X				X	
16	X													
17	X													
18	X								X					
19	X								X					
20	X								X					
21	X													X
22	X													X
23		X	X	X		X	X				X			
24	X								X					X
25	X													
26									X					
27									X					
28									X					
29									X					



3.6 Integration Efforts

Table KY.15 captures ways that the HMP risk assessment, mitigation goals and actions can be integrated into other City of Kyle documents, programs, and regulations.

Table KY.15, Plan Integration Efforts, City of Kyle

Name of Document	Type	Item Type	Process for Integration
City of Kyle Emergency Safety Plan	Outreach Document	Risk Assessment	<p>Inclusion of MPC member on safety planning committee to suggest the addition of following language to plan:</p> <ul style="list-style-type: none"> • If floodwaters rise around your car but the water is not moving, abandon the car and move to higher ground. Do not leave the car and enter moving water. • Avoid camping or parking along streams, rivers, and creeks during heavy rainfall. These areas can flood quickly and with little warning. • Tornado sheltering/when in a car. • Lightning when outdoors instructions. • Icy roads tips. • How to know if you are experiencing heat casualty symptoms. • How to know if you are experiencing extreme cold symptoms. • More specific evacuation route reference.
Hays Inform	Program	Action	Coordinate with Kyle Communications Department to link to existing Hays County HaysInformed.com emergency preparedness/awareness page when creating Public Awareness Page for hazards on Kyle website (Action 6).
City of Kyle Budget	Funding	Action	Seek training funds for Floodplain Administration training on future budgets through Kyle Engineering General Fund Line Item 18 for training. Pursue approval for funding during City budget approval period.
Parks Master Plan	Program	Goals	Seek participation from Parks Director in Kyle MPC in order to further collaborate efforts that can meet objectives from both the HMP and Parks Master Plan.
Hazard Mitigation Grant Program (HMGP)	Funding	Action	<p>Identify actions that can be funded through new and existing grant awards. Review existing mitigation actions for eligibility for the grant program, to include Benefit Cost consideration. Prepare grant application documents in advance to prepare for future grant periods.</p> <p>Process involves identification of actions from Plan; obtaining Council approval to apply; notification of interest in grant to the public; completion of application for funding; if awarded, obtaining Council approval to accept; if accepted, administration of funds and implementation of project.</p>
Pre-Disaster Mitigation (PDM)			
Flood Mitigation Assistance (FMA)			
TWDB Flood Protection Planning (FPP) Grant			



Table KY.15, Plan Integration Efforts, City of Kyle, cont.

Name of Document	Type	Item Type	Process for Integration
TWDB Clean Water State Revolving Fund (CWSRF)	Funding	Action	Identify actions that can be funded through new and existing loans. Review existing mitigation actions for eligibility for the loan program, to include Benefit Cost consideration. Prepare loan application documents in advance to prepare for future application periods.
Texas Water Development Fund (DFund)			Process involves obtaining Council approval to apply; notification of interest in loan to the public; completion of application for loan; if awarded, obtaining Council approval to accept; if accepted, administration of funds and implementation of project.

Incorporation Achievements Since Previous Plan Update

The City of Kyle incorporated the HMP into other planning mechanisms as a demonstration of progress in local hazard mitigation efforts. This was achieved by identifying MPC planners and or stakeholders to participate in the following local planning efforts:

- 2016 Kyle Parks and Recreation Master Plan
- City of Kyle 5 Year Capital Improvements Plan- Fiscal Years 2016-20
- City of Kyle Economic Development Strategic Plan
- Kyle Connected Transportation Master Plan 2040
- City of Kyle Stormwater Management Plan



Section 4: Finalize Plan Update (Review, Evaluation, and Implementation)

4.1 Changes in Development

Like most of Hays County, the City of Kyle is experiencing a large influx of growth and residential development. 77% of existing dwelling units in Kyle were built since 2000. The benefit of recent development is that any building codes instituted from 2000 on were implemented for the structures and in turn the development is more resilient to hazards. The population continues to grow as more people from the Austin area seek a less populated community in which to raise a family. Although the growing population could cause some increase in vulnerability to natural hazards, the adherence to building codes decreases risk.

New development is a sign of the growth that is occurring in Kyle, Texas.



4.2 Progress in Mitigation Actions

Past Mitigation Action Progress Reports Summary - Completed and Canceled

2011 Action Number	Hazard	Item Description	Lead Department
2	All hazards	Adopt City Structural Engineering Design Manual to mitigate against flood, tornado, and wind damage.	City of Kyle City Council, City of Kyle Engineering
Cost Estimate/Funding		Schedule	Status as of 2017
Existing City staff/ in-kind services		12 months	Completed.
Cost Effectiveness			
A low-cost method of ensuring that new development and substantial improvements are done with less risk for flood, tornado, and wind damage.			

2011 Action Number	Hazard	Item Description	Lead Department
5	All hazards	Development of and maintenance of County-wide and individual community HAZMAP Plans	City of Kyle
Cost Estimate/Funding		Schedule	Status as of 2017
Existing staff resources		Original Plan adopted on 4/20/2004. Update in 2011	Completed.
Cost Effectiveness			
Not independently cost-effective.			

2011 Action Number	Hazard	Item Description	Lead Department
8	Flood	Promote Flood Insurance	City of Kyle
Cost Estimate/Funding		Schedule	Status as of 2017
\$2,000		Ongoing	Canceled. This item duplicates the effort of Action 1.
Cost Effectiveness			
Not independently cost-effective, but the initial step identifying appropriate mitigation actions.			

4.3 Changes in Priorities

Plan-level priority changes are reflected in the changes to the plan-level goals shown in Chapter 3: Mitigation Strategy within the main plan document. As the City of Kyle continues to grow, the community demand for water in order to meet the needs of new citizens is creating a priority for water conservation and availability. This priority has led to the creation of the Hays County Public Utilities Agency, an alliance made up of San Marcos, Kyle and Buda and was done in an effort to ensure the availability of water for years to come.

In addition to the concerns for water conservation, the community also has a recent push for flood safety that has increased the number of flood-related mitigation actions in the community mitigation strategy.





Section 5: Approval and Adoption

5.1 Approval and Adoption Procedure

The procedures for approval and adoption are described in Chapter 4.1 of the main plan document.

Table KY.16, Municipal Jurisdiction Adoption Date

Municipality	APA Date	Adoption Date
City of Kyle		

Approval and Adoption



Jurisdiction Adoption Documentation Placeholder

References

- City of Kyle. (2014, 06 10). City Engineer. Retrieved from Stormwater Program and Storm Drainage & Flood Risk Mitigation Utility: <http://www.cityofkyle.com/cityengineer/stormwater-program-and-storm-drainage-flood-risk-mitigation-utility>
- City of Kyle. (2016). Finance. Retrieved from 5 Year Capital Improvements Plan for Fiscal Years 2016-20: http://www.cityofkyle.com/sites/default/files/fileattachments/finance/page/1070/cip-presentation_post_online.pdf
- City of Kyle, Texas. (2016, 12 6). A Resolution Approving and adopting an updated Parks and Recreation Master Plan. Resolution No. 1045. Kyle, TX.
- Halff Associates. (2016, 12 06). Kyle Plans. Retrieved from 2016 Kyle Parks and Recreation Master Plan: http://www.cityofkyle.com/sites/default/files/fileattachments/parks_and_recreation/page/1368/combined_kyle_park_plan_draft_11.28.2016.pdf
- Kyle Economic Development. (2015, 9 10). Economic Development Strategic Plan. Retrieved from KED Strategic Plan: <http://www.kyleed.com/sites/default/files/files/KEDStrategicPlan9-10-15FINAL.pdf>
- Lockwood, Andrews & Newnam. (2016). KyleConnected Transportation Master Plan 2040.
- Municode. (2017, 03 02). Kyle, TX. Retrieved from Municipal Website Ordinances: <https://www.municode.com/library/search?stateId=43&clientId=2876&searchText=How%20May%20We%20Help%20You%3F>
- National Fire Protection Association. (2013, June). NFPA News & Research. Retrieved from Lightning Fires and Lightning Strikes: <http://www.nfpa.org/news-and-research/fire-statistics-and-reports/fire-statistics/fire-causes/lightning-fires-and-lightning-strikes>
- National Highway Traffic Safety Administration. (2017, 03 11). Traffic Safety Facts. Retrieved from Texas 2011-2015: <https://cdan.nhtsa.gov/SASStoredProcess/guest>
- National Oceanic and Atmospheric Administration. (2016). Historical Hurricane Tracks. Retrieved from National Oceanic and Atmospheric Administration Coastal Management: <https://coast.noaa.gov/hurricanes/>
- National Oceanic and Atmospheric Administration Storm Event Database. (2016, 12 01). National Centers for Environmental Information. Retrieved from Data Access: <https://www.ncdc.noaa.gov/data-access>
- Texas A&M Forest Service. (2016, 12 01). Wildfire Risk Assessment Portal. Retrieved from Public Viewer: <https://www.texaswildfirerisk.com/>
- Texas Department of Transportation. (2017, 03 11). Crash Records Information System. Retrieved from C.R.I.S Query: <https://cris.dot.state.tx.us/public/Query/#/public/welcome>
- Texas Natural Resources Information System. (2011). TNRIIS Data Catalog Low Water Crossings. Retrieved from TNRIIS: <https://tnris.org/data-catalog>
- Tornado Facts. (2016, 03 16). Tornado Facts and Information . Retrieved from Tornado Scale: <http://www.tornadofacts.net/tornado-scale.php>
- USGS Earthquake Hazard Program. (2015). USGS Earthquake Hazard Program. Retrieved from USGS: <https://earthquake.usgs.gov/data/>



City of Mountain City Hays County Hazard Mitigation Plan Update 2018



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Mountain City Annex

Section 1: Organize and Review

This section contains a brief description of Mountain City and its jurisdictional features. In addition, Section 1 contains the following details regarding Mountain City's:

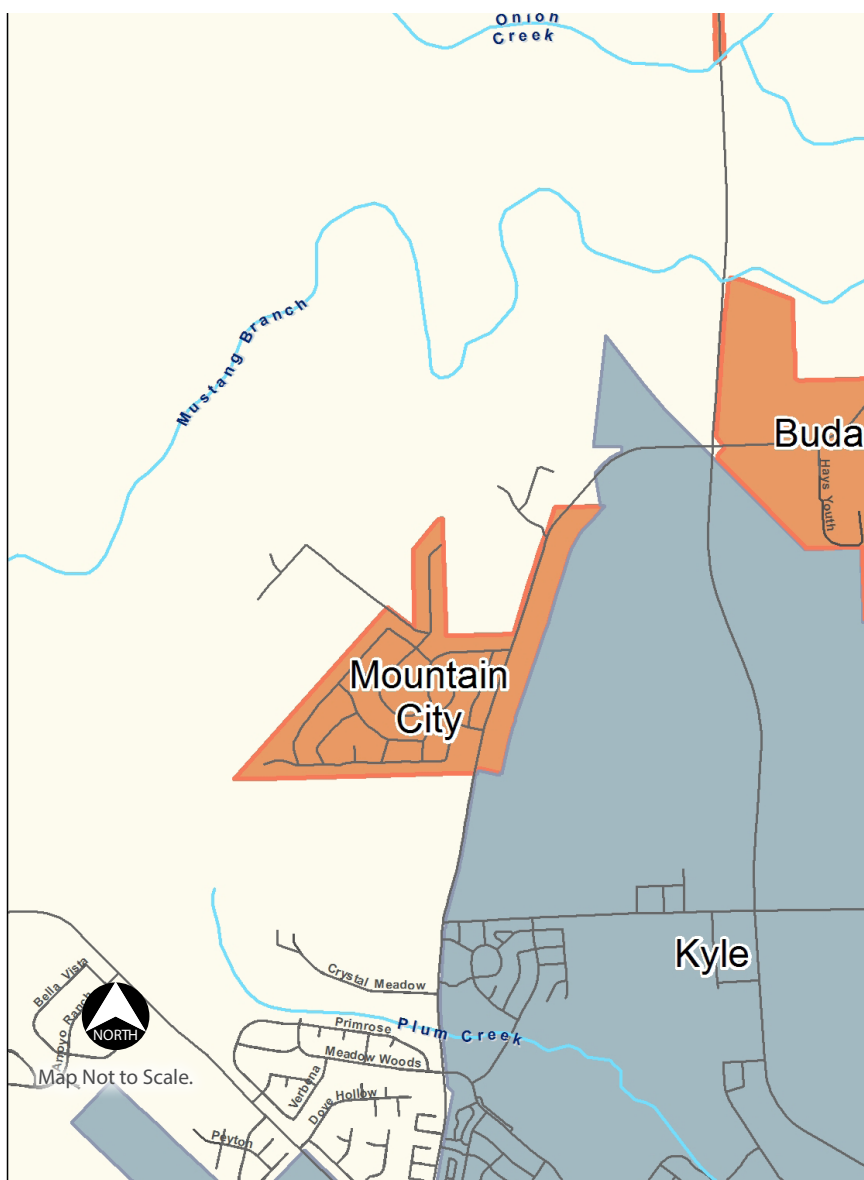
- participation in the Hays County HMP Update process,
- stakeholder engagement,
- public outreach strategy,
- incorporation efforts, and
- plan maintenance procedures.

*Population :	537
Size of Community:	0.42 sq. miles
*Population over 65 years old	55
*Population under 16 years old	130
Mountain City is serviced by the following responders:	
Fire - Kyle Fire Department	
EMS - San Marcos Hays County EMS	
Law Enforcement - Hays County Sheriff's Office	

**HAZUS-MH 3.2 Updated Census 2010 Population Estimates*



Figure MC.1, Mountain City



1.1 Community Description

When planning, it is important to take into account the characteristics that make a community unique. Consideration of unique needs when it comes to mitigating or recovering from natural hazards ensures that all members of the community and their needs are addressed.

Located 12 miles north of San Marcos in Central Hays County, Mountain City is less than a square mile in size. The community previously existed as a subdivision called Mountain City Oaks and incorporated as Mountain City in 1984 (Mountain City, Texas, 2017).

Served by Hays Consolidated Independent School District (ISD), the community has no school structures located within the City limits.

The community is 100% residential with 237 structures making up the entire City.

Hays County Hazard Mitigation Plan, Mountain City Annex

Mountain City is governed by a Mayor, Mayor Pro-Tem, 3 Aldermen, and supported by a City Secretary, City Treasurer, and City Administrator.

Mountain City's main utility providers are shown in Table MC.1.

Major Employers

Mountain City is 100% residential and does not have any employers besides home-based operations run and operated by community members.

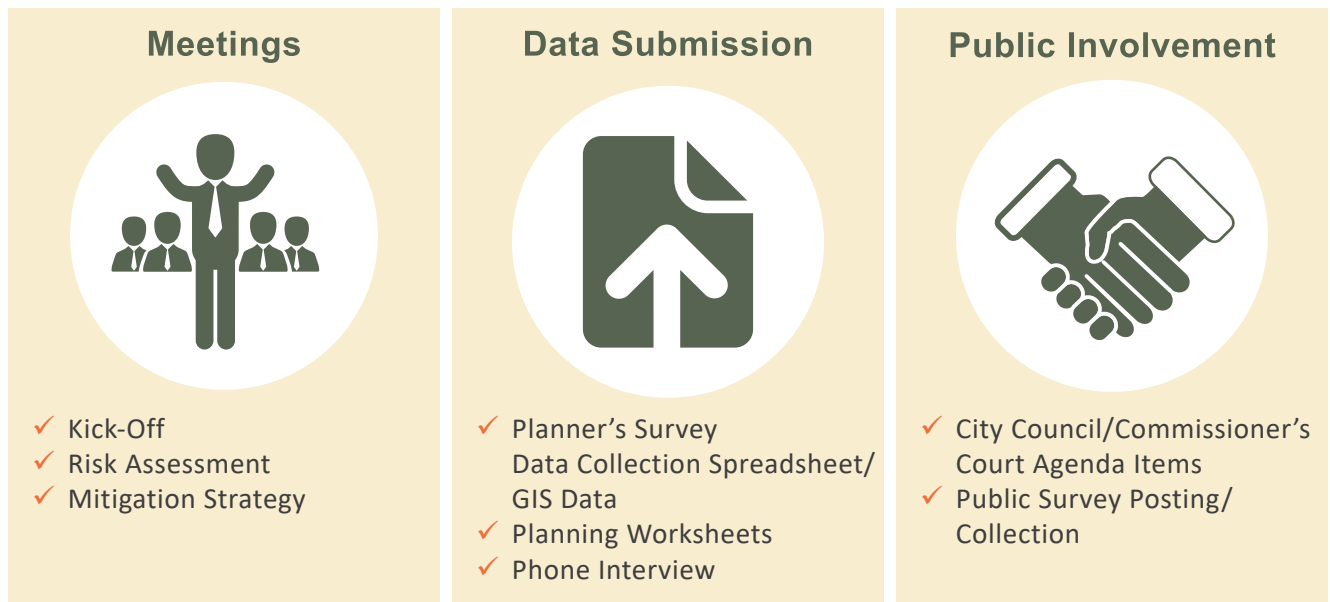
Table MC.1, Utility Providers

Type	Provider
Electric	Pedernales Electric Cooperative (PEC)
Water	Mountain City Oaks Water System

Community Planning Involvement

MPC planning activities for the Hays County Hazard Mitigation Plan (HMP) Update are captured in Figure MC.2, which utilizes check-marks to indicate each of the activities that were completed by the Mountain City MPC members.

Figure MC.2, Mountain City Plan Participation



1.2 Outreach Strategy

Mountain City was very active in the following outreach activities used to inform the public of their participation in the Hays County HMP Update.

Public Survey Promotion

Mountain City advertised the Hays County HMP Update Public Survey through the community email list, which is a self-subscribed list to which community members may subscribe.



As of March 10, 2017, Mountain City had 25 residents respond to the public survey. Details on how the survey data was directly incorporated into the risk ranking process for hazards is included in Chapter 2, the risk assessment portion of the main plan document.

City Council Meeting Announcement

On February 13, 2017, the Mayor presented information on the Hays County HMP Update to the Mountain City Council. Elected officials, local agency leaders, and members of the public attended the meeting. The Council agenda and item report for this presentation are included in Plan Appendix A of the Hays County HMP Update.

Plan Phase Newsletters

Mountain City MPC utilized newsletters for each phase of the planning process in order to share updates with stakeholders, elected officials, City staff, and the public. Copies of the newsletters can be found in Plan Appendix A of the Hays County HMP Update.

Plan Draft Public Review and Comment Period

The link to the draft Hays County HMP Update was posted on the Mountain City website from July 12, 2017 to July 26, 2017 and a hard copy was placed in the Mountain City Hall for public review. No public comments were received during this review period.

1.3 Incorporation of Sources

In addition to stakeholder and public input, the MPC also reviewed other planning resources that could provide useful information to the plan update process. Table MC.2 lists the documents reviewed and how they were considered for incorporation in the updated plan.

Table MC.2, Review/Incorporation of Sources

Name of Document	Type	How Incorporated
2013 State of Texas Hazard Mitigation Plan	Plan	Utilized hazard definitions and hazard classification names.
Flood Insurance Study	Study	Incorporated best available hydraulic and hydrologic study results for flood hazard profile.
Mountain City Waste Management Program	Program	Reviewed for opportunities for enhancement to incorporate brush pick-up service for wildfire and lightning mitigation. (Mountain City, TX, 2016)
Mountain City Building Permit	Program	Research for applicability of floodplain management elements. (Mountain City, TX, 2017)
Mountain City Directory Information Request Form	Program	Review for opportunities to enhance the current contact system for residents in Mountain City.(Mountain City, TX, 2017)
Mountain City Ordinances	Regulations	Reviewing ordinances for possible incorporation of mitigation practices, such as flood damage prevention ordinance or building codes.
Interlocal Agreement for Emergency Water Service	Agreement	Agreement between Hays Consolidated ISD and Mountain City Oaks Water System in order to interconnect their water systems to serve as alternative sources of water for emergency situations. Seeking ways to enhance to reduce the impacts of drought. (Hays County, 2010)

Section 2: Risk Assessment

Mountain City Jurisdictional Hazards

This section contains Mountain City's hazard profiles for each natural hazard included in the Hays County HMP Update. Profiles include:

- Location - the area where the hazard is known to occur
- Previous Occurrences - a history of reported events for the hazard
- Significant Previous Occurrences (when applicable) - notable hazard events within the community
- Extent - the strength or magnitude of the hazard
- Probability - the likelihood of the hazard event occurring in the future
- Impact - the consequence or effect (or possible effect) of hazard events
- Vulnerability Summary - identification of structures, systems, populations or assets susceptible to loss or damage and how they are/could be impacted

Hazard descriptions and extent scales for hazard magnitudes are found in Chapter 2, the risk assessment portion of the main plan document.

When available, data specific to Mountain City was used for hazard analysis. When no instances were reported specifically for the jurisdiction for regional hazards, County-wide data was applied.

State and national datasets were used to determine occurrence, extent, and the respective probabilities, rather than verbal testimonies, in an effort to retain data consistency. For some hazards, the National Oceanic and Atmospheric Administration (NOAA) Storm Events Database was used as the most comprehensive data available for hazards. The Storm Events Database does not always reflect the most recent totals for fatality, injury, and damage amounts for previous hazard occurrences. The Previous Occurrences paragraph identifies instances in which this may occur. Verbal testimony, when available, was integrated into impact or vulnerability summaries to account for updates in this data.

2.1 Hazard Profiles

Hazards profiled within the risk assessment include:

- Drought - Within Chapter 2, the Risk Assessment portion of main Plan document.
- Extreme Heat - Within Chapter 2, the Risk Assessment portion of main Plan document.
- Severe Winter Storms - Within Chapter 2, the Risk Assessment portion of main Plan document.
- Lightning - Within Chapter 2, the Risk Assessment portion of main Plan document.
- Hailstorms
- Windstorms
- Tornadoes
- Expansive Soils
- Floods
- Hurricanes/Tropical Storms
- Earthquakes
- Wildfires





Hailstorms

Hailstorms: Location

The entire extent of Mountain City is exposed to some degree of hail hazard. Since hail can occur at any location, hail events could be experienced anywhere within the jurisdiction.

Hailstorms: Previous Occurrences

While Mountain City has not had any previous occurrences reported through the NOAA Storm Events Database, if an event were to occur, it would be similar in size and magnitude to events within the surrounding County area. There were 57 hail events reported for Hays County since the year 1967.

Hailstorms: Extent and Probability

The Tornado and Storm Research Organization (TORRO) created a hail extent index to measure hail called the Hailstorm Intensity Scale. According to the reported previous hail occurrences for the planning area, the maximum hail extent experienced was up to 3 in., or 76.20 mm. in diameter. This corresponds to a TORRO Hailstorm Intensity Scale classification of a “Super Hailstorm.” Refer to Chapter 2, the risk assessment portion of the main plan document, for TORRO hail extent scale descriptions.

Based on 57 reported events in 49 years, a hail event occurs in Hays County approximately once a year, on average. Since hail events can happen anywhere throughout the HMP update area, Mountain City’s future probability is assumed to be similar to the surrounding County area. The City’s probability for a hail event is approximately once a year (on average) in the future, with hail up to 3 in., or 76.20 mm. in diameter, corresponding to a TORRO Hailstorm Intensity Scale classification of a “Super Hailstorm.”

Hailstorms: Impact

Based on the maximum hail extent experienced (76.20 mm) in the surrounding County area, the TORRO Hailstorm Intensity Scale indicates that impact can be expected to include any of the following:

- Varying degrees of damage to vegetation and crops
- Damage to plastic structures
- Varying degrees of damage to glass
- Paint and wood scored
- Vehicle bodywork damage
- Varying degrees of roof damage
- Varying degrees of risk of injuries
- Varying degrees of aircraft damage
- Brick walls pitted
- Risk of severe or even fatal injuries to persons caught in the open

During undocumented past instances of hail (based on resident testimony without dates or measurement data to include in this analysis), there are typically 3-5 roofs that need to be restored after a typical hail event.

Hailstorms: Vulnerability Summary

The shingle roof type on the residential structure that serves as City Hall could be susceptible to hail damage. There is no critical City equipment or vehicles.





Windstorms

Windstorms: Location

The entire extent of Mountain City is exposed to some degree of wind hazard. Since wind can occur at any location, wind events could be experienced anywhere within the jurisdiction.

Windstorms: Previous Occurrences

While Mountain City has not had any previous occurrences reported through the NOAA Storm Events Database, if an event were to occur, it would be similar in size and magnitude to events within the surrounding County area. There were 38 wind events reported for Hays County and its unincorporated jurisdictions from year 1974.

Windstorms: Extent and Probability

Wind is measured by the Beaufort Wind Scale that relates wind speed to observed conditions on land and sea. According to the reported previous windstorm occurrences for the planning area, the maximum wind extent experienced was 70 knots (corresponding to Beaufort Wind Scale Classification: Hurricane). Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of wind extent scales.

Based on 38 reported events in 42 years, a wind event occurs approximately once every year (on average) in Hays County. Since wind events can happen anywhere throughout the HMP update area, Mountain City's future probability is assumed to be similar to the surrounding County area. In the future, the City's probability of a wind event of up to 70 knots, or 80.55 miles per hour, (Hurricane Classification in the Beaufort Wind Scale) is approximately once every year (on average) in the future.

Windstorms: Impact

Data available from the Texas Department of Transportation's Crash Records Information System shows that between the years of 2010 and 2017, rural Hays County experienced 5 crashes related to severe crosswind weather conditions. There were no injuries reported from these crash events (see Table MC.3). Since wind events occur on a regional scale, it is assumed that weather related crashes in the surrounding County area would be similar to those experienced in these conditions within Mountain City.

Table MC.3, Windstorms, Vehicle Accidents, Hays County

City	Fatality	Incapacitating Injury	Non-Incapacitating Injury	Possible Injury	Crash Year	Street Name	Surface Condition	Weather Condition
Rural Hays County	0	0	0	0	2010	LIME KILN RD	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2017	US0290	Wet	Severe Crosswinds

(Texas Department of Transportation, 2017)





Structures can be damaged by flying debris and impact from winds, damaging rooftops and causing other structural damage. Critical infrastructure, such as utility poles and street signals, could also be disrupted, impacting all residents in the affected area. Debris on the roadway can also cause obstruction for emergency responders' ability to provide services.

Windstorms: Vulnerability Summary

Mountain City has previously experienced debris accumulation on roadways during past windstorm events. Such incidents could cause impact on the ability of public safety officials to respond to emergency calls. Undocumented accounts of wind events (without magnitude that could be included in analysis) indicated that in April of 2016, straight line winds caused downed trees and power lines. Pedernales Electric Cooperative performed repairs on the lines, however power was interrupted for residents for several hours.

Additionally, the residential structure serving as City Hall is not retrofitted to mitigate damages caused by extreme winds and does not have generator back-up. A lack of resources for electricity for City Hall or damage to the structure could lead to delays in getting assistance for members of the community.





Tornadoes

Tornadoes: Location

The entire extent of Mountain City is exposed to some degree of tornado hazard. Since tornadoes can occur at any location, tornado events could be experienced anywhere within the jurisdiction.

Tornadoes: Previous Occurrences

Since tornadoes can occur at any location, tornado events could be experienced anywhere within the jurisdiction. While Mountain City has not had any previous occurrences reported through the NOAA Storm Events Database, if an event were to occur, the event would be similar in size and magnitude to events within the surrounding County area. Table MC.4 lists the 16 tornado events reported for Hays County and its unincorporated jurisdictions since year 1953.

Fatality, injury and damage amounts are shown in Table MC.4, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table MC.4, Tornado Events, Hays County

Location	Date	Type	Extent	Fatalities	Injuries	Property Damage	Crop Damage
Hays County	4/28/1953	Tornado	F3	1	5	250,000.00	0.00
Hays County	4/30/1954	Tornado	F1	0	0	250,000.00	0.00
Hays County	5/2/1958	Tornado	F1	0	0	30.00	0.00
Hays County	11/12/1961	Tornado	F2	0	0	2,500.00	0.00
Hays County	9/20/1967	Tornado	NA	0	0	250.00	0.00
Hays County	9/20/1967	Tornado	NA	0	0	30.00	0.00
Hays County	5/10/1975	Tornado	F1	0	0	25,000.00	0.00
Hays County	3/30/1976	Tornado	F2	0	0	25,000.00	0.00
Hays County	3/30/1976	Tornado	F2	0	1	250,000.00	0.00
Hays County	8/10/1980	Tornado	F2	0	0	25,000,000.00	0.00
Hays County	4/22/1985	Tornado	F2	0	0	250,000.00	0.00
Hays County	8/22/1991	Tornado	F1	0	0	2,500.00	0.00
Countywide	5/13/1994	Tornado	F0	0	0	500.00	500.00
Henly	11/15/2001	Tornado	F0	0	1	50,000.00	0.00
Driftwood	10/8/2002	Tornado	F0	0	0	70,000.00	0.00
M. Gaynor	5/23/2015	Tornado	EF0	0	0	0.00	0.00
Total				1	7	\$26,175,810.00	\$500.00

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)

Tornadoes: Extent and Probability

Tornadoes are measured by severity on the Fujita and Enhanced Fujita Scales, with a range from 0-6. According to the reported previous tornado occurrences in the jurisdiction, the maximum tornado extent experienced was a category F3 tornado in 1953. Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of the Fujita (F) Scale and Operational Enhanced Fujita (EF) Scale.

Based on 16 reported events in 63 years, a tornado event occurs approximately every 4 years on average in Hays County. Mountain City's future probability is assumed to be similar to the surrounding County area. The City can expect a tornado event approximately once every 4 years (on average) in the future, with up to an F3 magnitude.





Tornadoes: Impact

Based on the surrounding County area having experienced tornadoes between F0 and F3 levels in the past, if similar events were to happen in the future in the City, the type of impacts that the jurisdiction can expect associated with those magnitudes would include (from least to greatest severity):

- Light Damage - Broken branches; shallow rooted trees pushed over; some chimney damage.
- Moderate Damage - Surface damage to roofs; mobile homes pushed off foundation; moving vehicles pushed off the road.
- Significant Damage - Frame houses have roof torn off; mobile homes completely destroyed; train boxcars overturned; large trees snapped or uprooted; smaller debris turned into missiles.
- Severe Damage - Roofs completely torn off well-constructed buildings, along with some walls; majority of trees uprooted; trains overturned; vehicles lifted off the ground.

(Tornado Facts, 2016)

Critical infrastructure, such as utility poles and street signals, could also be disrupted, impacting all residents in the affected area. Debris on the roadway can also cause obstruction for emergency responders' ability to provide services.

Tornadoes: Vulnerability Summary

Mountain City is 100% residential. There are no shelters or other buildings available within the City to provide temporary shelter for residents after a disaster event. There is no dedicated reverse-911 system or emergency communications source for residents, besides the email lists that they can subscribe to for emails regarding administrative issues and upcoming events. This leaves residents at risk if they are unaware of a tornado threat and therefore do not take shelter.

Mountain City has previously experienced debris accumulation on roadways during past windstorm events. This illustrates vulnerability as high winds and heavy debris accompany tornadoes. Such incidents could cause impact on the ability of public safety officials to respond to emergency calls. Additionally, the residential structure serving as City Hall is not retrofitted to mitigate damages caused by the extreme winds that accompany tornadoes and does not have generator back-up for these kind of events. A lack of resources for electricity for City Hall or damage to the structure could lead to delays in getting assistance for members of the community.





Expansive Soils

Expansive Soils: Location

Figure 2.3 within Chapter 2 (the risk assessment portion of the main plan document) shows the location of expansive soil areas for the City. The entire extent of the jurisdiction is classified as having less than 50 percent of the area underlain by soils with clays of high swelling potential, therefore all of the jurisdiction is equally at risk.

Expansive Soils: Previous Occurrences

There was no documentation of past site-specific events of structural damage due to expansive soils from local, State, or national databases queried.

Expansive soils cannot be documented as a time-specific event, except when they lead to structural and infrastructure damage. There are no specific damage reports or historical records of events in the City, however future events can occur.

Expansive Soils: Extent and Probability

Considering the amount of swelling potential within the jurisdiction, and the lack of reported events, the probability of a future event is low (0 - 1 occurrences in the next 10 years affecting less than 5 structures).

Expansive Soils: Impact

There have been several undocumented residential foundation problems that have occurred within the community (less than \$10,000 in damage) that could possibly be attributed to the presence of expansive soils.

Expansive Soils: Vulnerability Summary

The residences in the community were mostly constructed between 20 and 30 years ago, before the community was incorporated and before National Building Codes were adopted with specific codes for foundation work. As time progresses and the structures continue to age, the number of foundation issues could grow. A general lack of concern for the hazard creates a vulnerability due to the resulting lack of individual-level (homeowner) mitigation action for expansive soils.





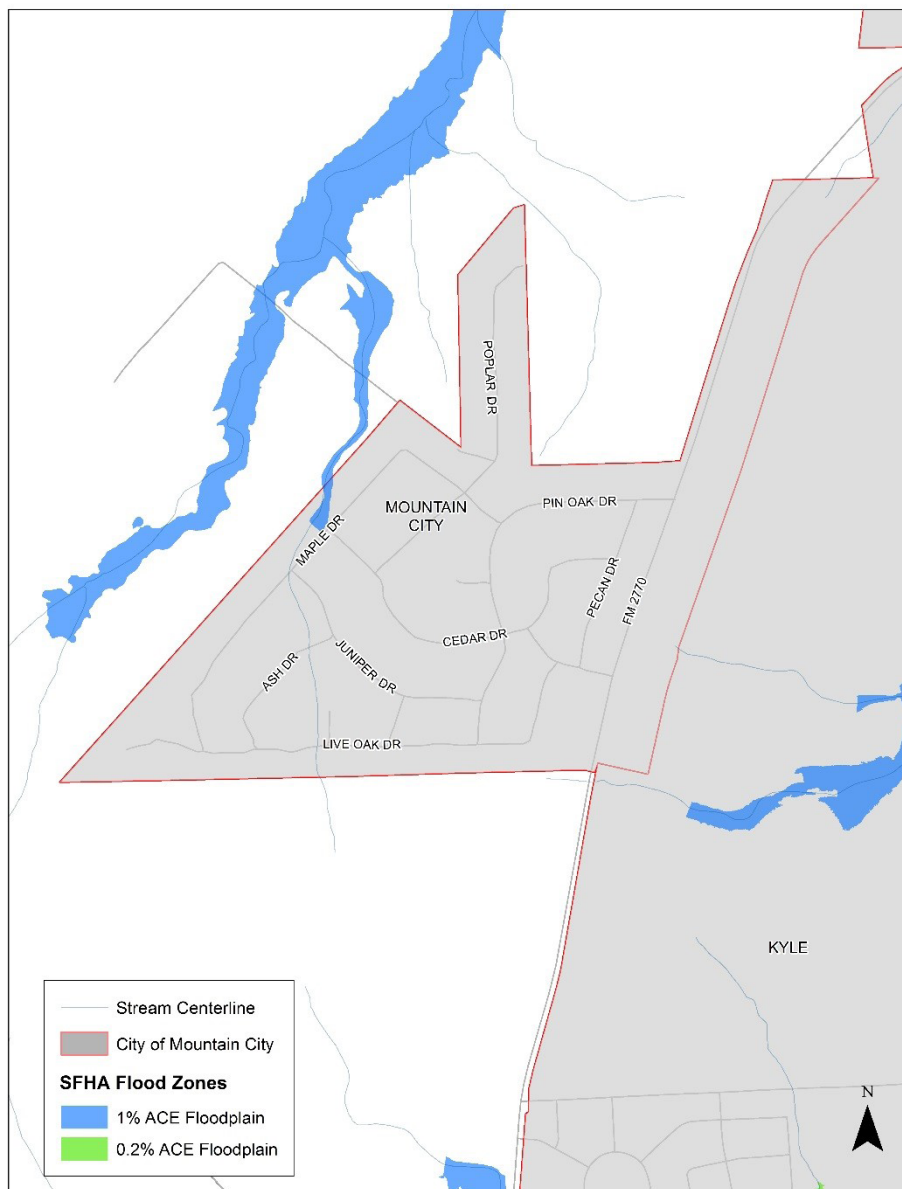
Floods

Floods: Location

The 1% Annual Chance Event (ACE) floodplain for Mountain City is shown in Figure MC.3, showing little Special Flood Hazard Area (SFHA) within the City limits. However, an unnamed tributary to Mustang Branch is located within the City, therefore localized flooding could still occur. Homes and roads located adjacent to this unnamed tributary would be the areas most affected if a flooding event were

to occur.

Figure MC.3, Special Flood Hazard Areas, Mountain City



(Texas Natural Resources Information System, 2011)



Floods: Previous Occurrences



Hays County was included in 3 Federal disaster declarations between 2013 and 2015, all related to flooding. Although there were no flood events reported specifically for Mountain City in the NOAA Storm Events Database, Table MC.5 lists the 69 documented events reported for Hays County and its unincorporated jurisdictions from year 1997 to 2016. Due to the size and extent of some flood occurrences as well as the regional nature of reports in the NOAA Storm Events Database, the jurisdiction may have been affected by many of the events that were reported for the surrounding areas.

Fatality, injury and damage amounts are shown in Table MC.5, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table MC.5, Flood Events, Hays County

Location	Date	Type	Fatalities	Injuries	Property Damage	Crop Damage
Countywide	5/23/1997	Flash Flood	0	0	10,000.00	0.00
Countywide	6/6/1997	Flash Flood	0	0	10,000.00	0.00
Countywide	6/7/1997	Flash Flood	0	0	15,000.00	0.00
Countywide	6/8/1997	Flash Flood	2	7	2,500,000.00	50,000.00
Countywide	6/21/1997	Flash Flood	0	0	5,000.00	0.00
Countywide	6/22/1997	Flash Flood	0	0	50,000.00	50,000.00
Countywide	2/21/1998	Flash Flood	0	0	5,000.00	0.00
Countywide	7/3/1998	Flash Flood	0	0	20,000.00	0.00
Countywide	8/22/1998	Flash Flood	0	0	20,000.00	10,000.00
Countywide	8/23/1998	Flash Flood	0	0	10,000.00	0.00
Countywide	10/17/1998	Flash Flood	0	100	500,000.00	50,000.00
HAYS (ZONE)	10/17/1998	Flood	0	25	4,000,000.00	50,000.00
HAYS (ZONE)	10/17/1998	Flood	0	25	4,000,000.00	50,000.00
Countywide	6/21/1999	Flash Flood	0	0	3,000.00	0.00
Countywide	6/9/2000	Flash Flood	0	0	15,000.00	0.00
Countywide	11/2/2000	Flash Flood	0	0	20,000.00	0.00
HAYS (ZONE)	11/4/2000	Flood	0	0	0.00	0.00
North Portion	8/26/2001	Flash Flood	0	0	10,000.00	0.00
Countywide	8/31/2001	Flash Flood	0	0	20,000.00	0.00
Countywide	8/31/2001	Flash Flood	0	0	30,000.00	20,000.00
Countywide	11/15/2001	Flash Flood	0	20	200,000.00	50,000.00
HAYS (ZONE)	11/15/2001	Flood	0	0	0.00	0.00
West Portion	6/30/2002	Flash Flood	0	0	10,000.00	0.00
HAYS (ZONE)	7/1/2002	Flood	0	0	0.00	0.00
South Portion	7/1/2002	Flash Flood	0	0	0.00	0.00
Countywide	7/2/2002	Flash Flood	0	0	0.00	0.00
West Portion	7/3/2002	Flash Flood	0	0	0.00	0.00
West Portion	7/5/2002	Flash Flood	0	0	0.00	0.00



Hays County Hazard Mitigation Plan, Mountain City Annex

Table MC.5, Flood Events, Hays County, cont.

Location	Date	Type	Fatalities	Injuries	Property Damage	Crop Damage
South Portion	9/19/2002	Flash Flood	0	0	0.00	0.00
South Portion	10/24/2002	Flash Flood	0	0	0.00	0.00
Countywide	11/4/2002	Flash Flood	0	0	0.00	0.00
Countywide	2/20/2003	Flash Flood	0	0	10,000.00	0.00
West Portion	6/13/2003	Flash Flood	0	0	5,000.00	0.00
South Portion	9/11/2003	Flash Flood	0	0	3,000.00	0.00
Northwest Portion	1/16/2004	Flash Flood	0	0	3,000.00	0.00
East Portion	6/5/2004	Flash Flood	0	0	0.00	0.00
Countywide	6/9/2004	Flash Flood	0	0	350,000.00	0.00
Driftwood	6/26/2004	Flash Flood	0	0	0.00	0.00
West Portion	6/27/2004	Flash Flood	0	0	0.00	0.00
West Portion	6/28/2004	Flash Flood	0	0	0.00	0.00
Countywide	6/29/2004	Flash Flood	0	0	0.00	0.00
South Portion	6/30/2004	Flash Flood	0	0	0.00	0.00
HAYS (ZONE)	6/30/2004	Flood	0	0	0.00	0.00
West Portion	7/25/2004	Flash Flood	0	0	0.00	0.00
Countywide	10/2/2004	Flash Flood	0	0	0.00	0.00
Countywide	10/23/2004	Flash Flood	0	0	0.00	0.00
HAYS (ZONE)	10/23/2004	Flood	0	0	0.00	0.00
HAYS (ZONE)	10/24/2004	Flood	0	0	0.00	0.00
Countywide	11/16/2004	Flash Flood	0	0	0.00	0.00
HAYS (ZONE)	11/17/2004	Flood	0	0	0.00	0.00
Countywide	11/21/2004	Flash Flood	0	0	0.00	0.00
Countywide	11/22/2004	Flash Flood	0	0	0.00	0.00
Countywide	11/22/2004	Flash Flood	0	0	0.00	0.00
Southeast Portion	11/23/2004	Flash Flood	0	0	0.00	0.00
South Portion	5/6/2006	Flash Flood	0	0	0.00	0.00
Henly	3/30/2007	Flash Flood	0	0	0.00	0.00
Driftwood	3/30/2007	Flood	0	0	0.00	0.00
Henly	5/2/2007	Flash Flood	0	0	0.00	0.00
Henly	7/2/2007	Flash Flood	0	0	0.00	0.00
Henly	5/17/2010	Flash Flood	0	0	0.00	0.00
Driftwood	9/7/2010	Flash Flood	0	0	0.00	0.00
Driftwood	5/10/2012	Flash Flood	0	0	0.00	0.00
Driftwood	5/11/2012	Flash Flood	0	0	0.00	0.00
Fitzhugh	5/17/2015	Flash Flood	0	0	0.00	0.00
Henly	5/30/2015	Flash Flood	0	0	0.00	0.00
Fitzhugh	6/14/2015	Flash Flood	0	0	0.00	0.00
Driftwood	10/30/2015	Flash Flood	0	0	10,000,000.00	0.00



Hays County Hazard Mitigation Plan, Mountain City Annex

Table MC.5, Flood Events, Hays County , (cont.)

Location	Date	Type	Fatalities	Injuries	Property Damage	Crop Damage
Fitzhugh	5/19/2016	Flash Flood	0	0	0.00	0.00
Driftwood	8/16/2016	Flash Flood	0	0	0.00	0.00
Totals			2	177	\$21,824,000.00	\$330,000.00

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)



Floods: Significant Past Events

Hays County experienced 3 disaster declarations discussed under Floods: Previous Occurrences. Refer to the Floods: Significant Past Events section within the Hays County Annex for narratives discussing these events.

Floods: Extent

While Mountain City has few properties in the designated floodplain, community testimony indicates that the City does experience flooding issues during large rain events. Past events have led to flooding of up to 4-6 inches in depth in roadways and low-lying areas, impeding and affecting City traffic and operations for periods of time. While residential flooding is limited, the events have caused minor damage to several residences and structures within the City.

Floods: Probability

Probability has been calculated on the basis of NOAA reported events, as a standard, consistent calculation method for all hazards profiled with the Hays County HMP. Based on 69 reported events in 19 years, a flood event occurs approximately 3 to 4 times per year on average in Hays County and its unincorporated jurisdictions. Due to the size and extent of some flood occurrences, as well as the regional nature of reports in the NOAA Storm Events Database, Mountain City's future probability is assumed to be similar to the surrounding County area. The City can expect a flood event approximately 3 to 4 times per year on average in the future, up to 4-6 inches in depth.

Floods: Impact

The following describes the inventory counts and building replacement values for the jurisdictional area.

Mountain City Building Counts			
Residential	Commercial	Other	Total
131	11	9	151

Mountain City Building Replacement Value		
Building (\$)	Content (\$)	Total (\$)
63,243,144	35,328,106	98,571,249

A Probabilistic 100-year Return Period HAZUS-MH 3.2 analysis was run for Mountain City. HAZUS results are calculated to census blocks. This analysis utilized the best available LiDAR (COA 2012 and CAPCOG 2008) and depth grids. These blocks were then intersected with the City to run a weighted area analysis to get jurisdictional results. The following paragraphs describe results from the 100-year Return (1% Annual Chance Event) weighted area analysis.

While this analysis did not produce any damages due to its upstream location on the Mustang Branch Tributary 2 - 1, the area could experience damages from an extreme event or localized flooding.





HAZUS-MH Results

General Building Stock Damage

HAZUS estimates that no buildings will be at least moderately damaged in Mountain City. 'At least moderately damaged' is defined by HAZUS as greater than 10% damage to a building. For this scenario, no buildings received any damages.

Building-Related Losses

Exposed Value is the total building and content values for structures within the community. The exposed value for the community is \$101,284,964. The total building-related losses were \$0 for this scenario.

Essential Facility Damage

HAZUS does not estimate any critical facilities or infrastructure interruption for more than 1 day on the day of the event. The model estimates that 100% of community hospital beds would be available for use by patients already in the hospital and those injured by an event.

Debris Generation

HAZUS estimates that no debris will be generated in this scenario.

Shelter Requirements

The model estimates no households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, no people are estimated to seek temporary shelter in public shelters.

Floods: Vulnerability Summary

According to community testimony, a recent change to the impervious cover on the side of the City that borders the high school led to an increase in flooding to homes that back-up to the property. The intent of the school was to reduce the strain that a row of cedar trees had on the local water supply. The unintended consequence of the removal of the trees negatively impacted the several residents of Mountain City.

National Flood Insurance Program Repetitive Loss

Mountain City is a current participant in the National Flood Insurance Program (NFIP) and has 2 tallied Repetitive Loss payments (as of September of 2016) with an average total (building & contents) payment of \$11,602.33. Details regarding Repetitive Loss can be found in Chapter 2: Step 4 National Flood Insurance Program Participation/Losses (within the risk assessment portion of the main plan document).

Structure Type	Number of Structures	Number of Claims	Amount of Claims
Residential	1	2	\$23,204.66
Non-Residential	0	0	N/A

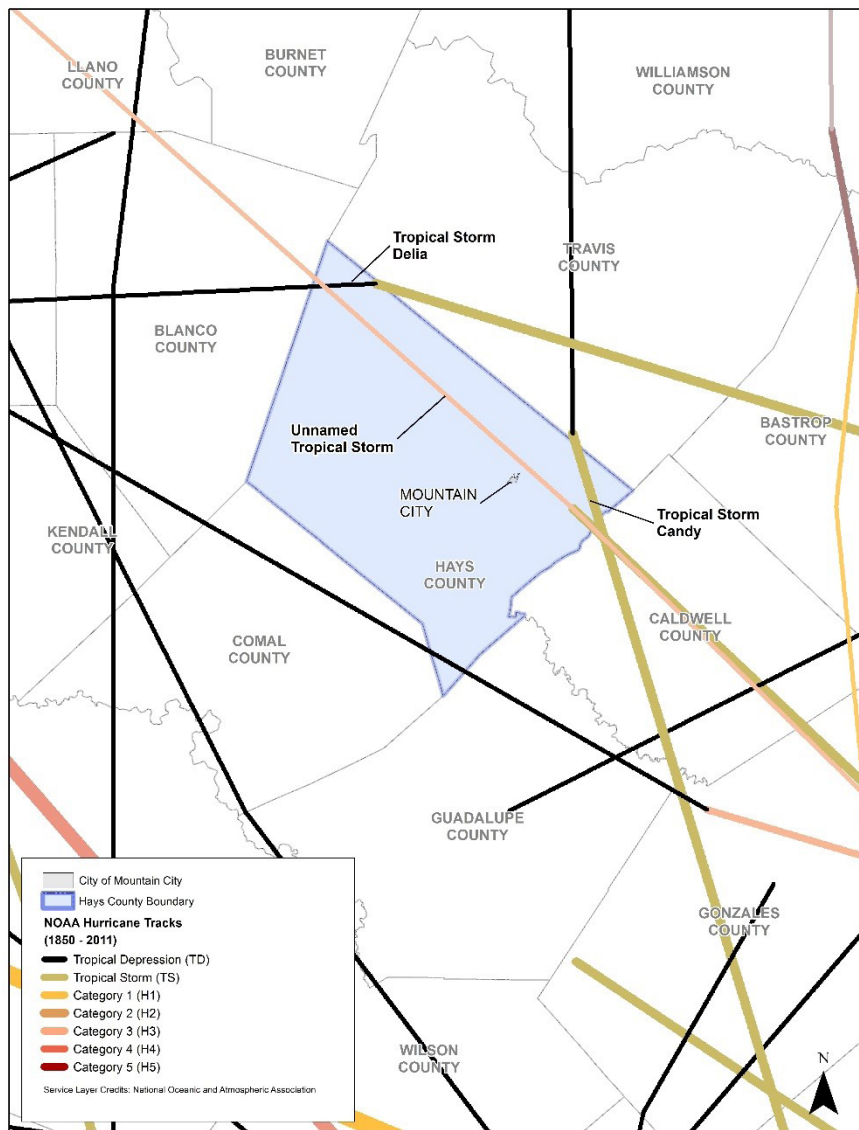


Hurricanes/Tropical Storms

Hurricanes/Tropical Storms: Location

Due to the regional nature of a hurricane or tropical storm event, the entire extent of Mountain City is equally exposed to a hurricane or tropical storm. Figure MC.4 illustrates the location of the jurisdiction with historical hurricane and tropical storm paths documented by NOAA's Hurricane Tracker from 1850 to 2011.

Figure MC.4, Historical Hurricane/Tropical Storm Paths, Mountain City



(National Oceanic and Atmospheric Administration, 2016)

Hurricanes/Tropical Storms: Previous Occurrences

The following previous events are listed based on NOAA Storm Events Database for Tropical Storm Hermine and NOAA Hurricane Tracker for all other events. By the time most hurricanes reach the County, they are tropical storms, depressions or thunderstorms. Because hurricane and tropical storm events occur on a regional scale, all events listed for Hays County have been included, as they would impact Mountain City.

July 13 to July 22, 1909 – An unnamed storm made landfall near Freeport, as a Category 3 Hurricane. This storm impacted Hays County and participating communities as a tropical depression with wind speeds





up to 30 knots. No significant damages, injuries, or fatalities were reported for the City.

June 22 to June 26, 1968 – Tropical Storm Candy made landfall near Port Aransas. This storm impacted Hays County and participating communities as a tropical storm with wind speeds slowing to 30 knots as a tropical depression just after leaving the County. No significant damages, injuries, or fatalities were reported for the planning area.

September 1 to September 7, 1973 – Tropical Storm Delia made landfall near the border of Brazoria and Matagorda counties. This storm impacted Hays County and participating communities as a tropical storm with wind speeds slowing to 30 knots as a tropical depression just after leaving the County. No significant damages, injuries, or fatalities were reported for the HMP update area.

September 6 to September 8, 2010 – According to the NOAA Storm Events Database, Tropical Storm Hermine made landfall near the Texas/Mexico border on the night of September 6. South Central Texas was hit very hard with widespread rains of 8-12 inches across much of the IH-35 corridor from Austin down to San Antonio.

Hurricanes/Tropical Storms: Extent and Probability

The Saffir-Simpson Scale measures pressure, wind speed, and storm surge in 5 categories. According to the reported previous hurricane occurrences in the jurisdiction, the maximum hurricane extent experienced was categorized as a tropical storm. Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of storm extents.

Based on 4 reported events in 107 years, a hurricane or tropical storm event occurs approximately every 27 years on average in Hays County. Since hurricane and tropical storm events can happen anywhere throughout the HMP update area, Mountain City's future probability is assumed to be similar to the surrounding County areas. In the future, the City can expect an event approximately once every 27 years on average, of up to a magnitude of a tropical storm at a 100-yr Max Wind Speed of 72 mph based on historical extents and HAZUS analysis.

Hurricanes/Tropical Storms: Impact

A Probabilistic 100-year Return Period HAZUS-MH 3.2 analysis was run on Mountain City. The following describes the results of this analysis.

HAZUS-MH Results

General Building Stock Damage

The total property damage losses were \$14,040. The majority of damage can be expected to impact residential areas (98%). The remaining damages (2%) are for commercial, industrial, agriculture and religious buildings. While some building damage is experienced, it is estimated that no buildings will be completely destroyed or experience severe damage. Exposed Value is the total building and content values for structures within the community. Loss values are divided separately for building and content loss in dollars.

Exposed Value (\$) (Building + Content)	Building Loss (\$)	Content Loss (\$)	Total Loss (\$)
101,284,964	14,035	4	14,040



Essential Facility Damage

HAZUS does not estimate any critical facilities or infrastructure to be interrupted for more than 1 day on the day of the event. The model estimates that 100% of available hospital beds would be available for use by patients already in the hospital and for those injured by the hurricane.

Debris Generation

HAZUS estimates the amount of debris that will be generated by the hurricane at a total of 1 ton. Of the total amount, brick/wood comprises 100% of the total. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckload (with 1 to 25 tons per truck) to remove the building debris generated by the hurricane.

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of people displaced that will require accommodations in temporary public shelters. The model estimates no households to be displaced due to the hurricane. While there is an estimation of over \$14,000 in property damages expected, it is aforementioned that “no buildings are estimated to be completely destroyed or experience severe damage.” Residents would likely remain in their homes as damages were repaired, therefore it is estimated that no temporary shelter is needed.

Hurricane/Tropical Storms: Vulnerability Summary

Similar to the impacts of Windstorms, Hailstorms, and Lightning, Mountain City can expect to be impacted with debris and possible interruptions of critical infrastructure. In addition, the community’s proximity to Interstate Highway 35 could lead to traffic delays caused by major evacuation efforts if the highway is used as an evacuation route for coastal residents.





Earthquakes

Earthquakes: Location

Locations within proximity to fault lines are typically the areas most at risk for earthquakes. Figure MC.5 shows USGS documented fault lines and the locations of earthquakes from 1847 to 2015 in relation to Mountain City.

Figure MC.5, Texas Earthquakes, 1847 – 2015, Mountain City



(USGS Earthquake Hazard Program, 2015)



Earthquakes: Previous Occurrences

According to USGS 1847-2015 data, there have been no documented earthquake events for Mountain City, as illustrated in Figure MC.5.

Earthquakes: Extent and Probability

Earthquakes are measured by Peak Ground Acceleration (PGA). The HAZUS Max PGA for the planning



area is 1.56% (see Mountain City Impact Section for a description of the HAZUS Analysis). This corresponds to the Modified Mercalli Scale Category IV, with light perceived shaking and no potential structure damage. HAZUS measures PGA on a census tract level. Cities within more than 1 census tract were assigned the highest PGA level to reflect the maximum possible extent. Refer to Chapter 2, the risk assessment portion of the main plan document, for extent scale and PGA descriptions.

As there have been no recorded previous occurrences of earthquakes for Mountain City and the PGA is less than 2% for the area, the probability of an earthquake in the City in the future is low (0 - 1 occurrences in the next 10 years at up to a 500-yr PGA of 1.56%).

Earthquakes: Impact

The FEMA How-To Guidance, Understanding Your Risks (FEMA 386-2, page 1-7), suggests the earthquake hazard should be profiled if the PGA is greater than 3%g, where PGA is measured in the acceleration of gravity (g). The City's PGA is less than 3%g (0.03) and there have been no recorded earthquakes in or near the jurisdiction. Therefore, only a minimum level-1 HAZUS analysis was profiled using the 500-year probability event scenario. The HAZUS analysis produced a PGA of 1.56%. HAZUS scenario would produce \$0 in building damages (Residential, Commercial, Agriculture, Religious and Government) from an event. Critical facilities and infrastructure would not experience any loss of service. There would be no critical facilities or infrastructure that would experience moderate to complete damage. No debris would be generated from this event and no people or households would require temporary housing. There would be no moderate, extensive or completely damaged buildings by this event. HAZUS estimates no residents are expected to be displaced from their homes or will require accommodations in temporary public shelters due to the simulated earthquake. Additionally, there would be no casualties or fatalities from this event.

Earthquakes: Vulnerability Summary

While the probability of an earthquake in Mountain City is low, with no significant prior events on file, there are fault lines within the community that could cause impact if there were to be an increase in seismic activity in the area. There is 1 fault line located on the west side of the City running along Maple Drive according to USGS data. Mountain City could expect to be impacted with debris and possible utility interruptions if an event were to occur in an unlikely and unprecedented scenario exceeding the 500-yr probability event scenario run in HAZUS. If an event of this magnitude were to incapacitate roadways, emergency responders would be hindered from responding, leaving the residents at risk.





Page 21 Dam/Levee Failure have been redacted from this copy of the plan.

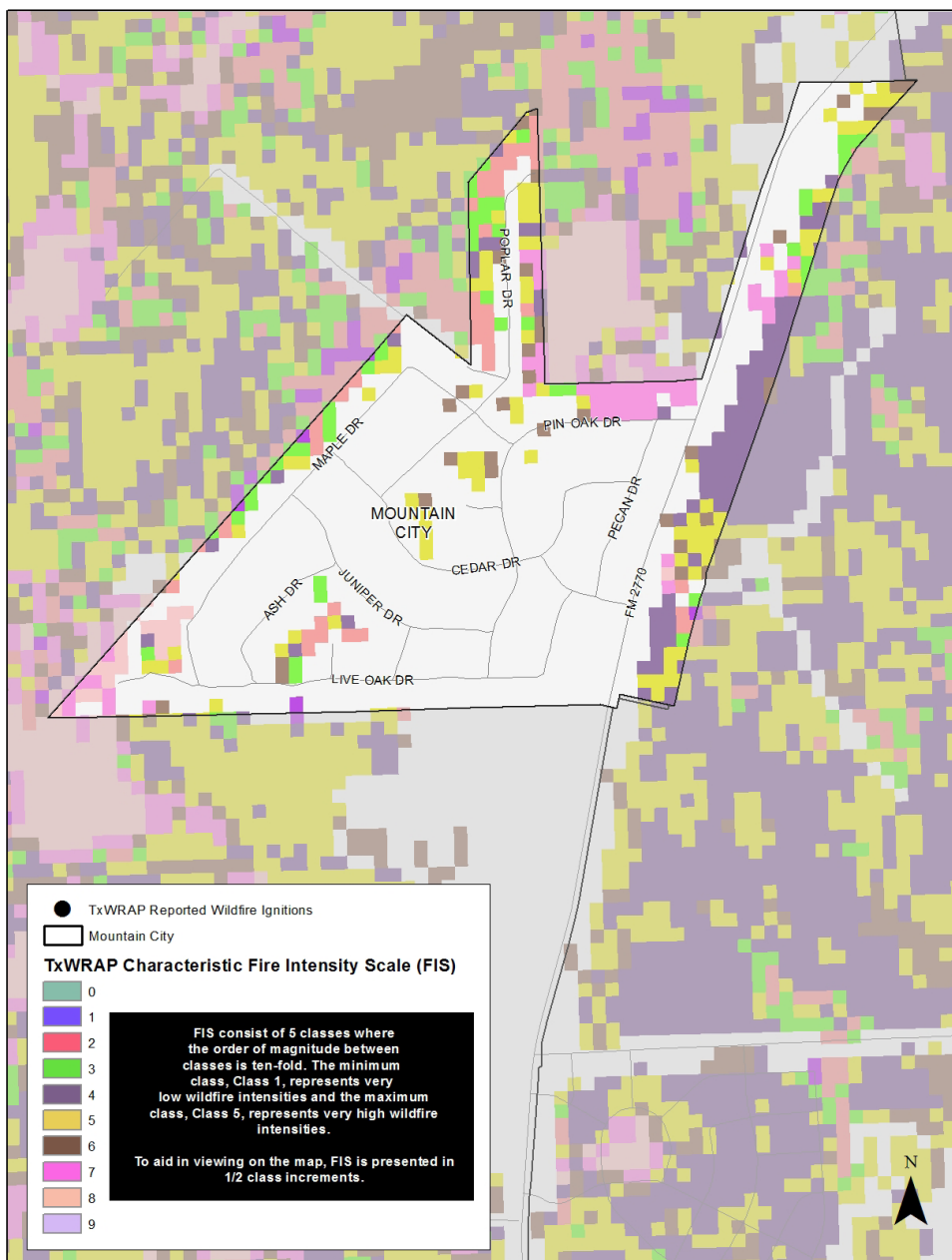


Wildfires

Wildfires: Location

The Texas A&M Forest Service's Texas Wildfire Risk Assessment Portal (TxWRAP) can be used to help communities understand their wildfire risk. Figure MC.6 below shows the location of TxWRAP's documented wildfire occurrences with Fire Intensity Scale (FIS) classifications within Mountain City. TxWRAP identifies FIS areas as those where wildfire fuels and associated potential dangerous fire behavior exist, based on a weighted average of 4 percentile weather categories.

Figure MC.6, Fire Intensity Scale (FIS), Mountain City



(Texas A&M Forest Service, 2016)



Wildfires: Previous Occurrences

There were no reported wildfire ignitions within Mountain City according to TxWRAP and USGS Federal Fire Occurrence data from the years 1980 to 2015.

Wildfires: Extent and Probability

Table MC.6 lists the Fire Intensity Acreage for the City, according to the Texas A&M Forest Service TxWRAP Community Summary Report. Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of the FIS.

Table MC.6, TxWRAP Fire Intensity Acreage, Mountain City, Texas

Class	Acres	Percent
Non-Burnable	189	74.00%
1 (Very Low)	1	0.50%
1.5	12	4.60%
2 (Low)	7	2.80%
2.5	11	4.30%
3 (Moderate)	15	6.00%
3.5	7	2.70%
4 (High)	8	3.20%
4.5	5	1.80%
5 (Very High)	0	0.00%
Total	255	100.0 %



There were no reported ignitions from TxWRAP and USGS Federal Fire Occurrence data in 35 years for Mountain City. However, a wildfire can be ignited from a variety of sources including lightning or by human activity such as campfires, smoking, arson, or equipment use. When considering the lack of reported previous events for the City, a wildfire event in the future is moderate, 1-10 occurrences in the next 10 years with up to a potential fire intensity of 4.5, or “High” classification on the TxWRAP FIS.

Wildfires: Impact

Impact on the community can be measured using TxWRAP housing density levels within the WUI. Areas with a higher housing and population density would be affected to a greater extent than rural areas, especially in areas near burnable fuels. In the event of a wildfire in high density areas of population, residential structures would be damaged or destroyed, critical infrastructure such as water, sewer and electrical services would be interrupted and residents would experience injury or loss of life. Table MC.7 lists the population, percent of total population, WUI acreage and percent of WUI acreage for Mountain City, according to the Texas A&M Forest Service TxWRAP Community Summary Report.

Table MC.7, WUI Acreage, Mountain City

Housing Density		WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
	LT 1hs/40ac	0	0.0 %	3	1.0 %
	1hs/40ac to 1hs/20ac	0	0.0 %	1	0.4 %
	1hs/20ac to 1hs/10ac	0	0.0 %	7	2.6 %
	1hs/10ac to 1hs/5ac	0	0.0 %	30	11.6 %
	1hs/5ac to 1hs/2ac	5	0.5 %	22	8.5 %
	1hs/2ac to 3hs/1ac	1,101	99.5 %	193	75.8 %
	GT 3hs/1ac	0	0.0 %	0	0.0 %
Total		1,106	100.0 %	255	100.0 %

Wildfires: Vulnerability Summary



Mountain City has residences that back-up to ranches that place them in the WUI and at risk for ignition of structures. There is infrastructure that supports the water supply as well as Pedernales Electric Cooperative power lines located in an area that backs up to ranches as well. The area is kept mowed, however a risk remains if private lots are not kept from becoming overgrown with vegetation.

The community has no official fire hydrants. There are pipe stands that can be used to fill water tanks for the purposes of fighting fires, however a pump could not be used by fire apparatus to fight a structure fire without causing water lines to collapse.

The community is serviced by an Emergency Services District that is dedicated to a portion of the County rather than just Mountain City.



2.2 Risk Ranking Result

On January 12, 2017, members of the Mountain City MPC completed a questionnaire as part of the Hays County Hazard Mitigation Plan Update: Risk Assessment. The questions covered the risk associated with the hazards that affect the community based on the level of concern over each profiled hazard, the hazards' impact on health and safety as well as property damage and business continuity. The answers from this questionnaire were combined with public survey results on perception of risk. The values from both sources were analyzed using the Halff Risk Ranking Tool (details regarding the risk ranking tool are in Chapter 2, the risk assessment portion of the main plan document). The results provided a quantified ranking of risk, with values ranging from 0 to 100. The results for Mountain City are shown below (hazard values are shown from highest to lowest risk):

Ranking Order	Hazard	Risk Ranking Value
1	Wildfire	92.8
2	Tornadoes	70.3
3	Drought	60.5
4	Wind Storms	55.3
5	Lightning	54.8
6	Floods	54.7
7	Hail Storms	45.8
8	Extreme Heat	44.7
9	Earthquakes	40.6
10	Expansive Soils	38.9
11	Severe Winter Storms	38.9 (Exact same value as Expansive Soils)
12	Hurricanes/Tropical Storms	32.8
-	Dam/Levee Failure	Not Profiled
-	Land Subsidence	Not Profiled



Section 3: Mitigation Strategy

This section examines the community's ability to perform mitigation (a review of existing capabilities is shown in Table MC.8) and identifies specific actions to address vulnerabilities for each hazard profiled in the Hays County HMP Update. The mitigation strategy is the application of actions into an approach for performing structural and non-structural mitigation efforts within the jurisdiction. Actions are also prioritized and considered for incorporation into other community programs, regulations, projects or plans.

Completed and canceled actions are also included in a separate section for future reference.

3.1 Existing Capabilities

Table MC.8, Existing Capabilities

Capability Name	Capability Type	Ability to Expand/Improve
Mayor/Emergency Management Coordinator	Elected Official	Political support and funding for mitigation actions/management of City-level HMP updates. Could attend mitigation information session to learn about community risks and mitigation strategy.
Aldermen		Political support and participation in HMP MPC. Could attend mitigation information session to learn about community risks and mitigation strategy.
City Administrator	City Staff	Support for implementation of mitigation actions. Participation in MPC as stakeholder.
Engineer/Floodplain Administrator	Consultant	Expertise in structural mitigation projects and compliance with flood damage prevention ordinance. Attend advanced floodplain management training.
Sales Tax	Funding	Provides potential funding for Hazard Mitigation items.
Property Tax		Provides potential funding for Hazard Mitigation items.
Permitting and Licensing Fees		Provides potential funding for Hazard Mitigation items.
Chapter 211 of the Local Government Code: Zoning	Authority	State-level code that authorizes the City to regulate zoning (State of Texas, 1987).
Chapter 213 of the Local Government Code: Municipal Comprehensive Plans		State-level code that authorizes the City to adopt a comprehensive plan for the long-range development of the City (State of Texas, 1997).
Chapter 214 of the Local Government Code		State-level code that authorizes the City to have regulatory authority as it relates to building codes (such as structural integrity and plumbing) (State of Texas, 1995).
Ordinance No. 021609		Gives the City authority to establish and maintain a uniform ordinance for development, maintenance and use of the property within its jurisdiction (Mountain City, TX, 2014). Development standards can be reviewed by MPC for consideration of amendments that would increase resiliency and mitigate risk.
Ordinance No. 121514A		Adopts National Model Building and Rehabilitation Codes (National Codes) (Mountain City, TX, 2014). Can continue to be updated as National codes are updated.
Waste Management	Program	Adopts an official vendor for Waste Management for Mountain City (Mountain City, TX, 2016). Brush pick-up provisions in the plan.
Interlocal Agreement for Emergency Water Service	Agreement	Provide opportunity for conservation measures. (Hays County, 2010)

3.2 National Flood Insurance Program Participation

Mountain City currently participates in the National Flood Insurance Program (NFIP). Currently, there are not any Certified Floodplain Managers on staff, due to a lack of resources and staff. The current Floodplain Administrator is the City Mayor. The amount of mapped floodplain in Mountain City is very small. The City has adopted minimum standards in their flood damage prevention ordinance and regulation of the development within the floodplain are done through Hays County Development Services as part of a Memorandum of Understanding between the City and the County. The City will continue to explore options for higher standards and consider application for the Community Rating System. Mountain City has a total of 8 NFIP policies in force, as of June 2016. This totals \$2,520,000.00 in total insurance coverage.

3.3 Mitigation Goals

The plan-level Mitigation Goals can be found in Chapter 3, the Mitigation Strategy portion of the Hays County HMP Update. These goals apply to each community and were mutually decided upon as the guiding goals for the development of actions in each jurisdiction.



Hays County Hazard Mitigation Plan, Mountain City Annex

3.4 Mitigation Actions

Risk Focus is defined as:

*E= Actions reducing risk to existing buildings and infrastructure

*F= Actions reducing risk to new development and redevelopment

Number/Title	Hazard	Item Description	Implementation Agency	
1 Adopt Higher Standards for Flood Damage Prevention Ordinance (previously action 2 in 2011 plan)	Floods	Create a plan to review the ordinance every 5 years and if possible, adopt 1 foot of freeboard in existing ordinance for new development and substantial repairs and also to include a field that requires City staff to check Flood Insurance Rate Maps before permits for building are approved.	Mountain City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		6 months	Not started	E/F
Cost and Benefit Considerations				
This item would only take the amount of time/labor required to amend an ordinance within the City. The benefit would be for substantially improved or new development.				

Number/Title	Hazard	Item Description	Implementation Agency	
2 Attend Local Floodplain Management Courses to receive Certification (previously action 3 in 2011 plan, modified)	Floods	Send member of the staff or elected official to training in order to become a Certified Floodplain Manager.	Mountain City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services, cost of accommodations for FEMA E-273 Floodplain Course and CFM testing session		6 months	Not started	E/F
Cost and Benefit Considerations				
If attending the course at the Emergency Management Institute, the cost of the course would be very low, and only include a minimal meal ticket purchase. The benefit of an informed floodplain administrator would help both new and existing residents through guidance on how to mitigate flood damages to development.				

Number/Title	Hazard	Item Description	Implementation Agency	
3 Improve Emergency Communication Capabilities- Phone Tree Plan (previously action 4 in 2011 plan, modified)	Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Floods, Hurricanes/Tropical Storms, Earthquakes, Wildfires	Continue existing City directory program and add phone tree responsibilities for non-critical hazard call down messaging, such as drought alerts.	Mountain City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff, community volunteer hours/ in-kind services		6 months	Ongoing	N/A
Cost and Benefit Considerations				
The implementation of this action would be a low-cost way to go beyond the current email communication that the community has with its members. The benefit would be to all who register to receive calls.				



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Number/Title	Hazard	Item Description	Implementation Agency	
4 StormReady Designation for Mountain City (previously action 6 in 2011 plan)	Windstorm, Hailstorm, Severe Winter Storms, Lightning, Hurricanes/ Tropical Storms, Tornadoes, Floods	Application preparation and submission for StormReady designation from the National Weather Service that attests to the community's level of preparedness for severe weather.	Mountain City Secretary	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		12 months	Not started	N/A
Cost and Benefit Considerations				
This free application would benefit all members of the community as Mountain City.				

Number/Title	Hazard	Item Description	Implementation Agency	
5 Cooling Plan for vulnerable members of the community during periods of extreme heat that result in power loss (previously item 7 in 2011 plan, modified)	Extreme Heat	Documented plan for how to provide cool accommodations for vulnerable populations during periods of extreme heat when electrical power is interrupted.	Mountain City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services, free brochures from FEMA		6 months	Not started	N/A
Cost and Benefit Considerations				
With existing staff documenting the interlocal agreements for assisting each other with accommodating their vulnerable populations, this effort would benefit approximately 185 who are either over 65 or under 16 years of age.				

Number/Title	Hazard	Item Description	Implementation Agency	
6 Promote Flood Insurance in the community (previously action 8 in 2011 plan)	Floods	Placing National Flood Insurance Program information brochures in City Hall.	Mountain City Secretary	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services, community volunteer hours/ in-kind services		1 month	Not started	N/A
Cost and Benefit Considerations				
The cost and labor required to promote the NFIP is negligible. The benefit is difficult to estimate.				



Hays County Hazard Mitigation Plan, Mountain City Annex

Number/Title	Hazard	Item Description	Implementation Agency	
7 Increase public awareness of hazard mitigation (previously action 9 in 2011 plan)	Drought, Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Expansive Soils, Floods, Hurricanes/Tropical Storms, Earthquakes, Wildfires	Increasing public awareness of natural hazards and hazardous areas; distributing information regarding hazards and potential mitigation measures. Promotional sources would include City website, social media, and public education programs. Provide link to HaysInformed on local page.	Mountain City Mayor	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		1 month	Not started	N/A
Cost and Benefit Considerations				
There is minimal cost and labor required to make this enhancement to the existing Mountain City website.				

Number/Title	Hazard	Item Description	Implementation Agency	
8 Monitor Drought Conditions (previously action 11 in 2011 action plan, modified)	Drought	Provide widget on Mountain City homepage that provides the latest US Drought Monitor conditions for the day, in addition to monitoring local water levels.	Mountain City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services, costs for water system monitoring		6 months	Ongoing. Water system purchase ongoing.	N/A
Cost and Benefit Considerations				
The cost for sharing the drought monitor should be minimal, however there may be more cost associated with monitoring the Mountain City Water System.				

Number/Title	Hazard	Item Description	Implementation Agency	
9 Develop drought contingency plan to ensure water for firefighting, provision of drinking water and reduction of groundwater depletion (previously action 12 in 2011 plan, modified)	Drought	Water conservation level triggers and actions documented and publicized.	Mountain City Water	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services, consultant fees from plan writers		6 months	Not started.	N/A
Cost and Benefit Considerations				
Although the cost of professional help for establishing a water conservation plan (drought plan) would be costly at the onset, the benefit to current and future residents is critical.				

Hays County Hazard Mitigation Plan, Mountain City Creek Annex

Number/Title	Hazard	Item Description	Implementation Agency	
10 Generator Purchase and Installation for City Hall	Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Floods, Hurricanes/Tropical Storms, Earthquakes, Wildfires	Back-up electrical power available to City Hall to ensure continuity of government operations and to also provide temporary sheltering for vulnerable populations in the City.	Mountain City Mayor	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services, grant writing assistance, Hazard Mitigation Grant program funding, if applicable and eligible		18 months	Not started	E
Cost and Benefit Considerations				
If grant funding is eligible, the cost/benefit of this project would have to be positive. There is only 1 public building in the City in use and it has no back-up source for power.				

Number/Title	Hazard	Item Description	Implementation Agency	
11 Icy Roads Response Plan (previously action 14 in 2011 plan, modified)	Severe Winter Storms	Documentation of how to keep ingress and egress to the community clear of ice so that first responders can access residents during severe winter storms.	Mountain City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services, County Support, possible contractor for ice removal		6 months	Not started	N/A
Cost and Benefit Considerations				
This planning effort would only take the time of City employees and could be critical to saving lives if a medical emergency occurred during a Severe Winter Storms event.				

Number/Title	Hazard	Item Description	Implementation Agency	
12 Coordination of new Limb and Large Item Pick-up day (Dumpster Day) for Wildfire Mitigation (previously action 15 in 2011 plan, modified)	Wildfires, Lightning, Windstorms, Tornadoes	Enhancement of existing large item pick-up or "Dumpster Day" to emphasize the wildfire mitigation benefits of cleaning brush and overgrown lots.	Mountain City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		2 months	Not started	N/A
Cost and Benefit Considerations				
This slight change to marketing an existing event would likely lessen the risk for wildland fire for residents located within the Wildland urban interface.				



Hays County Hazard Mitigation Plan, Mountain City Annex

Number/Title	Hazard	Item Description	Implementation Agency	
13 Flood-proofing repetitive loss structure that has been identified by FEMA for the number of flood insurance claims (previously action 16 in 2011 plan, modified)	Floods	Taking flood mitigation measures to reduce the amount of flood damage impacting a private residence in Mountain City that is classified as a Repetitive Loss structure by the National Flood Insurance Program.	Mountain City Council/ Hays County Planning & Development	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff hours/ in-kind services, cost-share for mitigating structure if Hazard Mitigation Grant funding is pursued		24 months	Not started	E
Cost and Benefit Considerations				
In order to qualify for grant funding for mitigation, the project would have to be cost-benefit effective. The City needs to analyze the actions available and cost-effective for mitigating the home.				

Number/Title	Hazard	Item Description	Implementation Agency	
14 Tree Removal Ordinance to enforce when and how trees should be removed (previously action 17 in 2011 plan, modified)	Floods, Wildfires, Windstorms, Lightning, Tornadoes, Severe Winter Storms	Development of an ordinance that would prohibit tree removal that would negatively impact neighboring properties. Also mitigate the effects of falling trees by calling for the removal of dead trees that could harm people or property or become debris during a wind event, or fuel during a fire event or lightning strike.	Mountain City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff hours/ in-kind services, legal consultation fees for review		6 months	Ongoing	N/A
Cost and Benefit Considerations				
This regulation would help the community enforce measures that would minimize adverse impact on neighbors, saving them an undetermined amount in damages or injuries.				

Number/Title	Hazard	Item Description	Implementation Agency	
15 Encroachment audit to ensure that the floodway in the City limits does not have any unauthorized dams or obstructions on a quarterly basis (previously action 18 in 2011 plan, modified)	Floods	Creation of an encroachment audit program to perform quarterly audits to visually inspect and document any violations to the flood prevention ordinance in the form of waste, debris or unauthorized private dams in the floodplain/floodway located near Maple Road.	Mountain City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services, volunteer hours to do inspections from the public street		2 months	Not started	E
Cost and Benefit Considerations				
The visual inspection of this property from the public road that runs parallel to it is virtually cost-free, besides the time to physically visit the site and the time to document the findings. The benefit to homeowners near the floodplain would be the prevention of adverse impacts in the future that could cause damage.				



Hays County Hazard Mitigation Plan, Mountain City Creek Annex

Number/Title	Hazard	Item Description	Implementation Agency	
16 Evacuation Plan Development (previously action 19 in 2011 plan, modified)	Wildfires, Floods	Creation of a formal evacuation plan that would provide residents with procedures for receiving evacuation messaging, evacuating the community, alternate routes and repatriation procedures for returning to the community safely.	Mountain City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services, possible acquisition of easement to create additional connectivity to community through creation of additional entrance/exit		24 months	Not started	N/A
Cost and Benefit Considerations				
With just the creation of a plan, the cost of this project could be minimal, however with the consideration of the creation of an additional point of entry/exit, the cost could increase substantially.				

Number/Title	Hazard	Item Description	Implementation Agency	
17 Homeowner maintenance workshops including expansive soil mitigation instruction for engineers and builders	Severe Winter Storms, Windstorms, Expansive Soils, Tornadoes, Drought, Wildfires, Floods	Public education workshops that feature experts from various fields that can provide advice on measures that can mitigate (xeriscaping for drought, foundation care for expansive soils, yard care for mitigating wildfire, safe room construction, retrofitting for flood or high winds), weatherproofing, protecting plumbing from cold, and rainwater harvesting.	Mountain City Mayor	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services for research or coordination of speakers, volunteer hours from speakers, cost of materials for hand outs		12 months	Not started	E
Cost and Benefit Considerations				
These overall low-cost workshops would save attendees an unknown amount in damages that could be mitigated.				

Number/Title	Hazard	Item Description	Implementation Agency	
18 Energy prioritization plan for citizens of the community for submittal to PEC	Extreme Heat, Severe Winter Storms, Windstorms, Tornadoes, Hurricanes/ Tropical Storms, Lightning	Identification and documentation of members of the community who depend on electricity for survival (medical).	Mountain City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services, hours from Pedernales Electrical Cooperative		6 months	Not started	N/A
Cost and Benefit Considerations				
The benefit of this survey to prioritize special needs in the community will assist and perhaps save lives.				



Hays County Hazard Mitigation Plan, Mountain City Annex

Number/Title	Hazard	Item Description	Implementation Agency	
19 Adoption of Soil Compaction Standards for Road Construction	Expansive Soils	Adoption of road techniques that require a higher level of soil compaction to mitigate expansive soils.	Mountain City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff, \$100 cost of printing		3 months	Not started	E/F
Cost and Benefit Considerations				
This low-cost effort would increase the resilience of new roads that support the entire population of the community.				

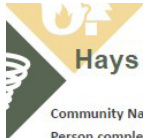


3.5 Capabilities Assessment

Evaluation/Prioritization of Actions

Each action added to the plan was developed using the Mitigation Action Summary Worksheet shown in Figure MC.7.

Figure MC.7, Mitigation Action Summary Worksheet

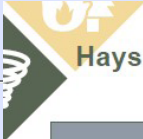


Hays County Hazard Mitigation Plan Update Process
Mitigation Action Summary Worksheet

Community Name:

Person completing questionnaire:

Mitigation Action/ Project Title	
Background/ Issue	
Opportunities for Integration	
Responsible Agency	
Partners	
Strategy for Existing Structures	



Hays County Hazard Mitigation Plan Update Process
Mitigation Action Summary Worksheet

Strategy for Future Development	
Potential Funding	
Cost Estimate (Values from "Measuring Costs" fields from Benefit and Cost Review Worksheet)	
Benefits (Statements from the "Difference" fields on the Benefit and Cost Review Worksheet)	
Timeline	
Priority (Based off Priority worksheet)	



Hays County Hazard Mitigation Plan, Mountain City Annex

Table MC.9, Mitigation Action Prioritization (with Hazards in order of highest priority to lowest)

Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community	Risk Ranking Score	Total Score
3 Improve Emergency Communication Capabilities- Phone Tree Plan	1	1	1	1	1	1	1	1	0	1	93	102
7 Increase Public Awareness of Hazard Mitigation	1	1	1	1	1	0	1	1	0	1	93	101
12 Coordination of New Limb and Large Item Pick-up day (Dumpster Day) for Wildfire Mitigation	1	1	1	1	1	0	1	1	0	1	93	101
17 Homeowner maintenance mitigation workshops including expansive soil mitigation instruction	0	1	1	1	1	1	1	1	0	1	93	101
16 Evacuation Plan Development	1	0	0	0	1	0	0	1	0	0	93	96
14 Tree Removal Ordinance- to enforce when and how trees should be removed	1	1	-1	0	1	0	0	-1	0	1	93	95
4 Storm Ready Designation for Mountain City	1	1	1	0	1	1	1	1	0	1	70	78
10 Generator Purchase for City Hall	1	0	1	1	1	0	1	1	0	1	70	77
18 Energy prioritization plan for citizens of the community for submittal to PEC	1	0	1	1	-1	0	1	1	0	1	70	75
15 Encroachment audit to ensure that the floodway in the City limits does not have any unauthorized dams or obstructions on a quarterly basis	0	1	1	1	1	1	1	1	0	1	55	63
13 Flood-proofing repetitive loss structure that has been identified by FEMA for the number of flood insurance claims	0	1	-1	1	0	1	1	-1	1	1	55	59
11. Icy Roads Response Plan (ensuring process does not harm environment)	1	0	1	1	1	0	1	1	0	0	39	45
4. Storm Ready Designation from National Weather Service	0	0	0	0	0	0	0	0	0	0	95	95
3. Floodplain Management Training	0	0	0	0	0	0	0	-1	0	0	95	94.1
5. Energy Restore Priority Effort	1	0	-1	0	0	0	1	-1	0	0	90	90
9. De-icing Contract Research/Plan Development	1	0	0	1	0	0	0	0	0	0	68	70
19. Adoption of Soil Compaction Standards for Road Construction and Residential Recommendation	1	0	1	-1	0	0	0	1	0	1	39	42

Mitigation Actions by Hazard

The mitigation actions are shown with corresponding hazards in Table MC.10 below.

Table MC.10, Mitigation Action Impact, Mountain City

Action Number	Drought	Extreme Heat	Severe Winter Storms	Lightning	Hailstorms	Windstorms	Tornadoes	Expansive Soils	Floods	Land Subsidence	Hurricanes/Tropical Storms	Earthquakes	Dam/Levee Failure	Wildfire
1									X					
2									X					
3		X	X	X	X	X	X		X		X	X		X
4			X	X	X	X	X		X		X			
5		X												
6									X					
7	X	X	X	X	X	X	X	X	X		X	X		X
8	X													
9	X													
10		X	X	X		X	X				X			
11			X											
12			X	X		X	X							X
13									X					
14			X	X		X	X		X					X
15									X					
16									X					X
17	X		X			X	X	X	X					X
18		X	X	X		X	X				X			
19								X						



Hays County Hazard Mitigation Plan, Mountain City Annex

3.6 Integration Efforts

Table MC.11 captures ways that the HMP risk assessment, mitigation goals and actions developed in the HMP can be integrated into other Mountain City documents, programs and regulations.

Table MC.11, Plan Integration Efforts, Mountain City

Name of Document	Type	Item Type	Process for Integration
Mountain City Building Permit	Form	Action	Add field on building permit to require Mountain City staff to check flood insurance rate maps to ensure that development is not occurring within the floodplain. If it is, the plans and details will be forwarded to Hays County for support in ensuring the flood damage prevention ordinance is followed.
"Dumpster Day"	Program	Action	Amend existing waste management contract to increase number of brush pick-up days. Also enhance existing large-item pick-up event to provide wildfire mitigation focus to the event marketing.
HaysInformed.com	Program	Goals	Coordinate with City website administrator to use HaysInformed.com links on the Mountain City website Hazard Information page to provide residents with additional resources and information regarding the hazards that affect Hays County.
Hazard Mitigation Grant Program (HMGP)	Funding	Action	Identify actions that can be funded through new and existing grant awards. Review existing mitigation actions for eligibility for the grant program, to include Benefit Cost consideration. Prepare grant application documents in advance to prepare for future grant periods.
Pre-Disaster Mitigation (PDM)			
Flood Mitigation Assistance (FMA)			Process involves identification of actions from Plan; obtaining Council approval to apply; notification of interest in grant to the public; completion of application for funding; if awarded, obtaining Council approval to accept; if accepted, administration of funds and implementation of project.
TWDB Flood Protection Planning (FPP) Grant			
TWDB Clean Water State Revolving Fund (CWSRF)			
Texas Water Development Fund (DFund)			
			Identify actions that can be funded through new and existing loans. Review existing mitigation actions for eligibility for the loan program, to include Benefit Cost consideration. Prepare loan application documents in advance to prepare for future application periods.
			Process involves obtaining Council approval to apply; notification of interest in loan to the public; completion of application for loan; if awarded, obtaining Council approval to accept; if accepted, administration of funds and implementation of project.

Incorporation Achievements Since Previous Plan Update

Data, information, and mitigation goals and actions were not integrated into other planning mechanisms in the last 5 years prior to this update due to a lack of funding and resources.

Section 4: Finalize Plan Update (Review, Evaluation, and Implementation)

4.1 Changes in Development

With little changes in development, the majority of the activity in Mountain City construction is from home renovations and repairs. As the community is nearly completely built-out, there are no new significant changes in development. The level of vulnerability to natural hazards has not increased or decreased as a result of development occurring since the previous plan update.

4.2 Progress in Mitigation Efforts

Past Mitigation Action Progress Reports Summary - Completed and Canceled

2011 Action Number	Hazard	Item Description	Lead Department
10	Drought	Wildfire Hazard Areas	Mountain City
Cost Estimate/Funding		Schedule	Status as of 2017
\$500		TBD; likely initiated in 2011	Canceled due to lack of applicability to activities at the local level. This projects is being undertaken by Hays County as an application to the Firewise program.
Cost Effectiveness			
Not independently cost-effective but essential in minimizing loss of life and injuries during significant storms			

2011 Action Number	Hazard	Item Description	Lead Department
13	Extreme Heat	Evaluate Excessive Heat Risks	Mountain City
Cost Estimate/Funding		Schedule	Status as of 2017
No addition cost-uses existing staff resources		TBD; probably initiated in 2011	Canceled due to lack of priority, feasibility, and benefit to community.
Cost Effectiveness			
Not independently cost-effective, but needed to develop adequate risk reduction efforts			

4.3 Changes in Priorities

Plan-level priority changes are reflected in the changes to the plan-level goals shown in Chapter 3: Mitigation Strategy within the main plan document.

As new elected officials have brought new platforms for their governance of the community, the latest officials seek to enhance and improve existing regulations. In addition they wish to prioritize the structural integrity of critical facilities and infrastructure, as well as the safety of residents.



Section 5: Approval and Adoption

5.1 Approval and Adoption Procedure

The procedures for approval and adoption are described in Chapter 4.1 of the main plan document.

Table MC.12, Municipal Jurisdiction Adoption Date

Municipality	APA Date	Adoption Date
Mountain City		





Jurisdiction Adoption Documentation Placeholder

References

- Hays County. (2010, 02 27). Interlocal Agreement for Emergency Water Service. Mountain City, TX.
- Mountain City, Texas. (2017, 03 16). Mountain City, TX. Retrieved from About Mountain City: <http://www.mountaincitytx.com/about/>
- Mountain City, TX. (2014, 09 01). Mountain City, TX Downloads. Retrieved from Ordinance No. 021609: http://www.mountaincitytx.com/download/mountain_city_ordinances/Mountain%20City%20Ordinance%20021609%20-%20Rev%2009082014.pdf
- Mountain City, TX. (2014, 12 15). Mountain City< TX Downloads. Retrieved from Ordinance No. 121514A: http://www.mountaincitytx.com/download/mountain_city_ordinances/Mountain%20City%20Ordinance%20121514A.pdf
- Mountain City, TX. (2016, 01 01). Mountain City, TX Downloads. Retrieved from City Forms : http://www.mountaincitytx.com/download/mountain_city_forms/Waste-Management-Recycling-Services-Residential-Form.pdf
- Mountain City, TX. (2017, 03 16). Mountain City Downloads. Retrieved from Mountain City Forms: <http://www.mountaincitytx.com/city-documents/>
- National Fire Protection Association. (2013, June). NFPA News & Research. Retrieved from Lightning Fires and Lightning Strikes: <http://www.nfpa.org/news-and-research/fire-statistics-and-reports/fire-statistics/fire-causes/lightning-fires-and-lightning-strikes>
- National Highway Traffic Safety Administration. (2017, 03 11). Traffic Safety Facts. Retrieved from Texas 2011-2015: <https://cdan.nhtsa.gov/SASStoredProcess/guest>
- National Oceanic and Atmospheric Administration. (2016). Historical Hurricane Tracks. Retrieved from National Oceanic and Atmospheric Administration Coastal Management: <https://coast.noaa.gov/hurricanes/>
- National Oceanic and Atmospheric Administration Storm Event Database. (2016, 12 01). National Centers for Environmental Information. Retrieved from Data Access: <https://www.ncdc.noaa.gov/data-access>
- State of Texas . (1995, 08 28). Texas Constitution and Statutes. Retrieved from Local Government Code-Title 7. Regulation of Land Use, Structures, Businesses and Related Activities, Subtitle A. Municipal Regulatory Authority, Chapter 214 Municipal Regulation of Housing and Other Structures: <http://www.statutes.legis.state.tx.us/Docs/LG/htm/LG.214.htm>
- State of Texas. (1987, 09 1). Texas Constitution and Statutes. Retrieved from Local Government Code-Title 7. Regulation of Land Use, Structures, Businesses and Related Activities, Subtitle A. Municipal Regulatory Authority, Chapter 211 Municipal Zoning Authority, Subchapter A General Zoning Regulations: <http://www.statutes.legis.state.tx.us/SOTWDocs/LG/htm/LG.211.htm>
- State of Texas. (1997, 09 01). Texas Constitution and Statutes. Retrieved from Local Government Code-Title 7. Regulation of Land Use, Structures, Businesses and Related Activities, Subtitle A. Municipal Regulatory Authority, Chapter 213 Municipal Comprehensive Plans: <http://www.statutes.legis.state.tx.us/Docs/LG/htm/LG.213.htm>
- Texas A&M Forest Service. (2016, 12 01). Wildfire Risk Assessment Portal. Retrieved from Public Viewer: <https://www.texaswildfirerisk.com/>
- Texas Department of Transportation. (2017, 03 11). Crash Records Information System. Retrieved from C.R.I.S Query: <https://cris.dot.state.tx.us/public/Query/#/public/welcome>
- Texas Natural Resources Information System. (2011). TNRIIS Data Catalog Low Water Crossings. Retrieved from TNRIIS: <https://tnris.org/data-catalog>
- Tornado Facts. (2016, 03 16). Tornado Facts and Information . Retrieved from Tornado Scale: <http://>

www.tornadofacts.net/tornado-scale.php


USGS Earthquake Hazard Program. (2015). USGS Earthquake Hazard Program. Retrieved from USGS:
<https://earthquake.usgs.gov/data/>

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Niederwald
TEXAS 78640

CITY HALL

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 *City Of Niederwald*

City of Niederwald
Hays County Hazard
Mitigation Plan Update
2018



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City of Niederwald Annex

Section 1: Organize and Review

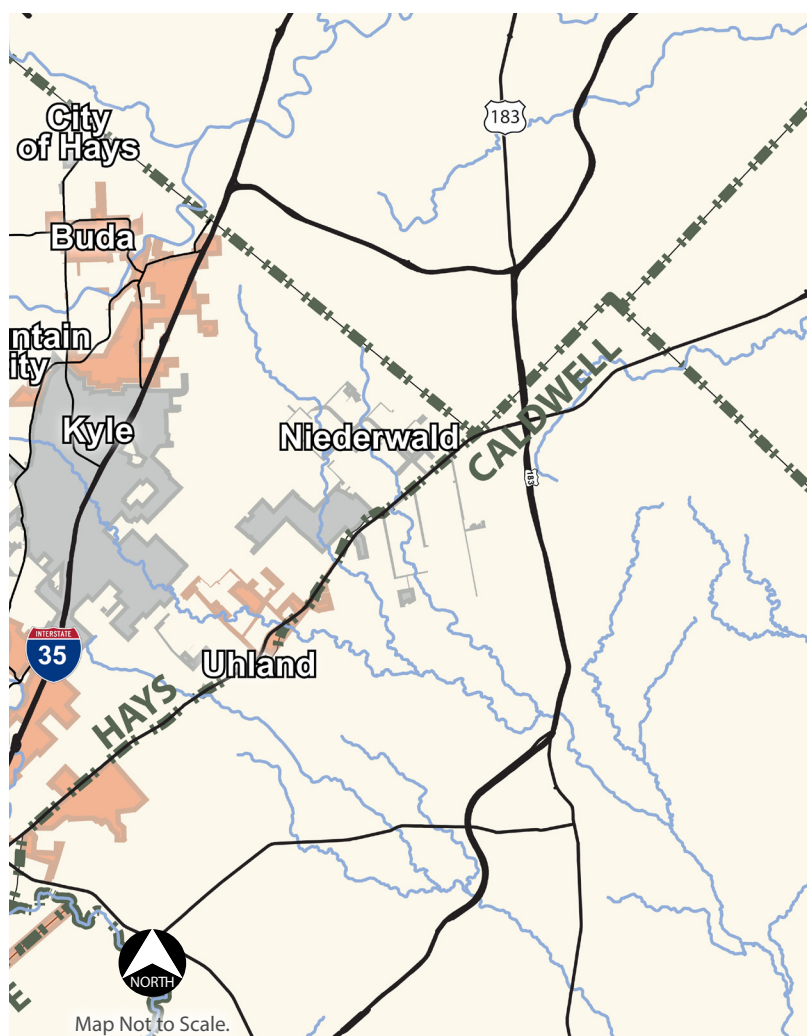
This section contains a brief description of the City of Niederwald and its jurisdictional features. In addition, Section 1 contains the following details regarding Niederwald's:

- participation in the Hays County HMP Update process,
- stakeholder engagement,
- public outreach strategy,
- incorporation efforts and
- plan maintenance procedures.

*Population :	399
Size of Community:	3.55 sq. miles
*Population over 65 years old	36
*Population under 16 years old	110
*Economically Disadvantaged Population (\$0-\$20k)	32
Niederwald is serviced by the following responders:	
Fire/EMS - Chisholm Trail Fire Rescue / ESD #1, Niederwald Volunteer Fire Department	
Law Enforcement - Hays County Sheriff's Office	

**HAZUS-MH 3.2 Updated Census 2010 Population Estimates*

Figure NW.1, City of Niederwald Planning Area



1.1 Community Description

When planning, it is important to take into account the characteristics that make a community unique. Consideration of unique needs when it comes to mitigating or recovering from natural hazards ensures that all members of the community and their needs are addressed.

Located in Hays and Caldwell Counties, Niederwald is located on Highway 21, known as the Camino Real. Niederwald faces the challenges of having to conduct business in 2 separate County jurisdictions with a small staff and limited operating budget. The community is a General Law Type A municipality and is governed by a Mayor, Mayor Pro-tem and 4 Council Members. These officials are supported by 1 member of the City Staff, the dual-role City Administrator/Secretary.

Served by the Hays Consolidated Independent School District and Lockhart Independent School District (ISD), Niederwald has 3 subdivisions (2 of which are mobile home communities) within the City limits and is in the process of developing 6 more that will be a combination of site-built and mobile homes. The population will likely quadruple in the next 5 years,

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with subdivisions making up about 40% of the community. The overall community development goal is to increase retail development by 400% and residential by 400%. There is currently only 1 convenience store and 2 restaurants that support the tax base. Outside of subdivisions, the remainder of the community is made up of approximately 40% manufactured/mobile homes, a small percentage of farmland and 10-15% of undeveloped tracts. The remainder of the community is made up of ranchettes.

Niederwald incorporated in 1987 and currently is among the communities with the most farmland in Hays County.

Niederwald's major employers are listed in Table NW.1 and major utility providers are listed in Table NW.2.

Table NW.1, Major Employers

Business Type	Name of Employer
Retail	Valero (convenience store/gas station)
Restaurant	H & Aleyda's Mexican Restaurant
Restaurant	El Camino Restaurant

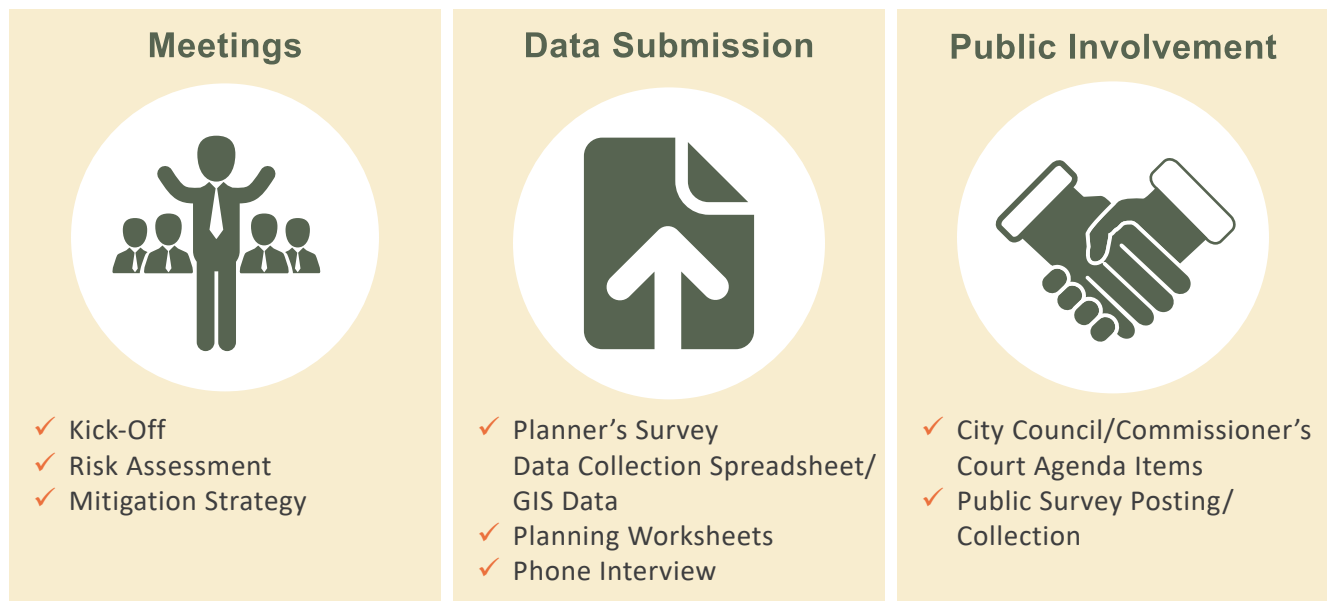
Table NW.2, Utility Providers

Type	Provider
Electric	Bluebonnet Electric Cooperative/ Pedernales Electric Cooperative (PEC)
Water	Goforth Special Utilities District

Community Planning Involvement

MPC planning activities for the Hays County Hazard Mitigation Plan (HMP) Update are captured in Figure NW.2, which utilizes check marks to indicate each of the activities that were completed by the Niederwald MPC.

Figure NW.2, City of Niederwald Plan Participation





1.2 Outreach Strategy

The City of Niederwald was very active in the following outreach activities used to request the public participation in the Hays County Hazard Mitigation Plan Update.

Public Survey Promotion

Niederwald advertised the Hays County Hazard Mitigation Plan Update Public Survey on the City of Niederwald homepage of <http://niederwaldtx.com>.

As of March 10, 2017, Niederwald had 0 residents respond to the public survey, this was despite the fact that the survey was advertised to the public. Details on how the survey data was directly incorporated into the risk ranking process for hazards is included in Chapter 2, the risk assessment portion of the main plan document.

City Council Meeting Announcement

On January 23, 2017, the City Administrator presented information on the Hays County Hazard Mitigation Plan Update to the Niederwald City Council and public attendees. Elected officials, local agency leaders and members of the public attended the meeting. The Council agenda and item report for this presentation is included in Plan Appendix A of the Hays County HMP Update.

Plan Phase Newsletters

Niederwald was provided with newsletters at each phase of the planning process in order to be able to share updates on the planning process with stakeholders, City staff and the public. Copies of the newsletters can be found in Plan Appendix A.

Plan Draft Public Review and Comment Period

The link to the draft Hays County HMP (hosted on the Hays County Office of Emergency Services page) was posted on the City of Niederwald website from July 12, 2017 until July 26, 2017 and a hard copy was placed in the Niederwald City Hall for public review. No public comments were received during this review period.

1.3 Incorporation of Sources

In addition to stakeholder and public input, the MPC also reviewed other planning resources that could provide useful information to the plan update process. Table NW.3 lists the documents reviewed and how they were considered for incorporation in the updated plan.



Table NW.3, Review/Incorporation of Sources

Name of Document	Type	How Incorporated
2013 State of Texas Hazard Mitigation Plan	Plan	Utilized hazard definitions and hazard classification names.
Flood Insurance Study	Study	Incorporated best available hydraulic and hydrologic study results for flood hazard profile.
City of Niederwald Ordinance 120406-B Zoning	Regulations	<p>Reviewed to seek opportunities for mitigation enhancement. Ordinance currently includes FP designation to identify floodplains. (Niederwald, TX, 2006)</p> <p>Reviewed for Floodplain Reference, the ordinance includes:</p> <ul style="list-style-type: none"> Floodplain Setback Lines requiring a setback, also requires proposed lots to have at least 1 acre out of the floodplain for an unsewered lot and at least 1/2 acre out of the floodplain for a sewer lot. It also indicates that the City Engineer may require a hydrologic/hydraulic study to be performed by the developer's engineer and approved by the City to determine the floodplain. It requires the 100-year floodplain to be shown on the preliminary plat and plans. <p>(Niederwald, Tx, 2000)</p>
City of Niederwald Ordinance 12605-A Subdivision	Regulations	<p>Reviewed to seek opportunities for mitigation enhancement. Included:</p> <ul style="list-style-type: none"> Consideration of the ordinance's "...desires to protect the creeks and waterways in the City of Niederwald and limit flooding of adjacent property." Ordinance also establishes Critical Water Quality Zones and requires site plans consider respect to the "protection and conservation of watercourses and areas subject to flooding." <p>(Niederwald, TX, 2006)</p>
City of Niederwald Ordinance 71706 Site Development	Regulations	<p>Reviewed for mitigation measures:</p> <ul style="list-style-type: none"> Adopts the standards of the City of Austin Drainage Criteria Manual. Establishes drainage easements. Regulation of peak runoff rates. Design requirements to minimize erosion. Requires runoff computations and establishes standards. Addresses stormwater conveyance and storm sewer standards. <p>Numerous other flood-related considerations are addressed. None are presented as actionable items for the Plan, yet do set the standard for floodplain consideration in the community development. (Niederwald, TX, 2017)</p>
City of Niederwald Building Permit Application	Form	<p>Reviewed for possible enhancements/improvements to document/process.</p> <ul style="list-style-type: none"> Found necessity for clarification of floodplain review for building and need to address requirement for elevation certificates for development in the Special Flood Hazard Area.



Section 2: Risk Assessment

City of Niederwald Jurisdictional Hazards

This section contains Niederwald's hazard profiles for each natural hazard included in the Hays County HMP Update. Profiles include:

- Location - the area where the hazard is known to occur
- Previous Occurrences - a history of reported events for the hazard
- Significant Previous Occurrences (when applicable) - notable hazard events within the community
- Extent - the strength or magnitude of the hazard
- Probability - the likelihood of the hazard event occurring in the future
- Impact - the consequence or effect (or possible effect) of hazard events
- Vulnerability Summary - identification of structures, systems, populations or assets susceptible to loss or damage and how they could be impacted

Hazard descriptions and extent scales for hazard magnitudes, are found in Chapter 2, the risk assessment portion of the main plan document.

When available, data specific to Niederwald was used for hazard analysis. When no instances were reported specifically for the jurisdiction for regional hazards, County-wide data was applied.

State and national datasets were used to determine occurrence, extent, and the respective probabilities, rather than verbal testimonies, in an effort to retain data consistency. For some hazards, the National Oceanic and Atmospheric Administration (NOAA) Storm Events Database was used as the most comprehensive data available for hazards. The Storm Events Database does not always reflect the most recent totals for fatality, injury and damage amounts for previous hazard occurrences. The Previous Occurrences paragraphs identify instances in which this may occur. Verbal testimony, when available, was integrated into impact or vulnerability summaries to account for updates in this data.

2.1 Hazard Profiles

Hazards profiled within the Risk Assessment include:

- Drought - Within Chapter 2, the risk assessment portion of main plan document.
- Extreme Heat - Within Chapter 2, the risk assessment portion of main plan document.
- Severe Winter Storms - Within Chapter 2, the risk assessment portion of main plan document.
- Lightning - Within Chapter 2, the risk assessment portion of main plan document.
- Hailstorms
- Windstorms
- Tornadoes
- Expansive Soils
- Floods
- Hurricanes/Tropical Storms
- Earthquakes
- Dam/Levee Failure
- Wildfires



Hailstorms

Hailstorms: Location

The entire extent of the City of Niederwald is exposed to some degree of hail hazard. Since hail can occur at any location, hail events could be experienced anywhere within the planning area.

Hailstorms: Previous Occurrences

According to the NOAA Storm Events Database, there was 1 documented hail event listed for the City of Niederwald and 57 documented events listed for Hays County and its unincorporated jurisdictions from year 1967. While the NOAA Storm Events Database lists events since the year 1967 for the County, events were not documented per jurisdiction until 1993.

Hailstorms: Extent and Probability

The Tornado and Storm Research Organization (TORRO) created a hail extent index to measure hail called the Hailstorm Intensity Scale. According to the reported previous hail occurrences for the planning area, the maximum hail extent experienced was up to 1.75 inches, or 44.45 millimeters, in diameter. This size corresponds to a TORRO Hailstorm Intensity Scale classification of "Destructive." Refer to Chapter 2, the risk assessment portion of the main plan document, for the TORRO hail extent scale descriptions.

Based on 1 reported event in 23 years, the City of Niederwald can expect a hail event approximately once every 23 years (on average) in the future, with hail up to 1.75 inches, or 44.45 millimeters in diameter, TORRO Hailstorm Intensity Scale classification of "Destructive."

Hailstorms: Impact

Based on the maximum hail extent experienced (44.45 millimeters), the TORRO Hailstorm Intensity Scale indicates that impact can be expected to include any of the following:

- Varying degrees of damage to vegetation and crops
- Damage to plastic structures
- Varying degrees of damage to glass
- Paint and wood scored
- Vehicle bodywork damage
- Varying degrees of roof damage
- Varying degrees of risk of injuries
- Varying degrees of aircraft damage
- Brick walls pitted

Hailstorms: Vulnerability Summary

Although the City has not experienced significant damage to public property due to hail stones, the City Hall is susceptible to hail. City Hall is currently a modular building with a metal roof. Besides a zero-turn mower, there are no other vehicles or equipment that need protecting. Future purchases of equipment is likely, as development continues. The City will consider storage options for these purchases as they are made.





Windstorms

Windstorms: Location

The entire extent of the City of Niederwald is exposed to some degree of wind hazard. Since wind can occur at any location, wind events could be experienced anywhere within the planning area.

Windstorms: Previous Occurrences

According to the NOAA Storm Events Database, there were 2 documented wind events listed for the City of Niederwald and 38 documented events listed for Hays County and its unincorporated jurisdictions since the year 1974. While the NOAA Storm Events Database lists events since 1974 for the County, events were not documented per jurisdiction until 1994.

Windstorms: Extent and Probability

Wind is measured by the Beaufort Wind Scale that relates wind speed to observed conditions on land and sea. According to the reported previous windstorm occurrences in the planning area, the maximum wind extent experienced was 43 knots (corresponding to Beaufort Wind Scale Classification: Strong Gale). Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of wind extent scales.

Based on 2 reported events in 22 years, the City of Niederwald can expect a wind event of up to 43 knots approximately once every eleven years (on average) in the future (Beaufort Wind Scale Classification: Strong Gale).

Windstorms: Impact

Data available from the Texas Department of Transportation's Crash Records Information System shows that between the years of 2010 and 2017, rural Hays County experienced 5 crashes related to severe crosswind weather conditions. There were no injuries reported from these crash events. Since wind events occur on a regional scale, it is assumed that weather related crashes in the surrounding County area would be similar to those experienced in these conditions within Niederwald (see Table NW.4).

Table NW.4, Windstorms, Vehicle Accidents, Hays County

City	Fatality	Incapacitating Injury	Non-Incapacitating Injury	Possible Injury	Crash Year	Street Name	Surface Condition	Weather Condition
Rural Hays County	0	0	0	0	2010	LIME KILN RD	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2017	US0290	Wet	Severe Crosswinds

(Texas Department of Transportation, 2017)



Structures can be damaged by flying debris and impact from winds, damaging rooftops and causing other structural damage. Manufactured homes are especially vulnerable to damage that high winds can cause, to include destruction in the most extreme event conditions.

Critical infrastructure, such as utility poles and street signals, could also be disrupted, impacting all residents in the affected area. Debris on the roadway can also cause obstruction for emergency responders' ability to provide services.

Windstorms: Vulnerability Summary

Niederwald has previously experienced debris accumulation on roadways during past windstorm events. Such incidents can cause impact on the ability of public safety officials to respond to emergency calls.

Modular buildings, manufactured and mobile homes make up approximately 40% of the structures within Niederwald. Niederwald City Hall is a modular structure. These structures are more vulnerable to damage from severe winds than site-built structures. Significant structural damage to City Hall could lead to delays in getting assistance for members of the community.





Tornadoes

Tornadoes: Location

The entire extent of the City of Niederwald is exposed to some degree of tornado hazard. Since tornadoes can occur at any location, tornado events can be experienced anywhere within the planning area.

Tornadoes: Previous Occurrences

While the City of Niederwald has not had any previous occurrences reported through the NOAA Storm Events Database, if an event were to occur, the event would be similar in size and magnitude to events within the surrounding County area. Table NW.5 lists the 16 tornado events reported for Hays County and its unincorporated jurisdictions since the year 1953.

Fatality, injury and damage amounts are shown in Table NW.5, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table NW.5, Tornado Events, Hays County

Location	Date	Type	Extent	Fatalities	Injuries	Property Damage	Crop Damage
Hays County	4/28/1953	Tornado	F3	1	5	250,000.00	0.00
Hays County	4/30/1954	Tornado	F1	0	0	250,000.00	0.00
Hays County	5/2/1958	Tornado	F1	0	0	30.00	0.00
Hays County	11/12/1961	Tornado	F2	0	0	2,500.00	0.00
Hays County	9/20/1967	Tornado	NA	0	0	250.00	0.00
Hays County	9/20/1967	Tornado	NA	0	0	30.00	0.00
Hays County	5/10/1975	Tornado	F1	0	0	25,000.00	0.00
Hays County	3/30/1976	Tornado	F2	0	0	25,000.00	0.00
Hays County	3/30/1976	Tornado	F2	0	1	250,000.00	0.00
Hays County	8/10/1980	Tornado	F2	0	0	25,000,000.00	0.00
Hays County	4/22/1985	Tornado	F2	0	0	250,000.00	0.00
Hays County	8/22/1991	Tornado	F1	0	0	2,500.00	0.00
Countywide	5/13/1994	Tornado	F0	0	0	500.00	500.00
Henly	11/15/2001	Tornado	F0	0	1	50,000.00	0.00
Driftwood	10/8/2002	Tornado	F0	0	0	70,000.00	0.00
Mt. Gainor	5/23/2015	Tornado	EF0	0	0	0.00	0.00
Total				1	7	\$26,175,810.00	\$500.00

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)

Tornadoes: Extent and Probability

Tornadoes are measured by severity on the Fujita and Enhanced Fujita Scales, with a range from 0-6. According to the reported previous tornado occurrences in the planning area, the maximum tornado extent experienced was a category F3. Refer to Chapter 2, the risk assessment portion of the main plan document for a description of tornado extent scales, Fujita (F) Scale and Operational Enhanced Fujita (EF) Scale.

Based on 16 reported events in 63 years, a tornado event occurs approximately every 4 years (on average) in Hays County. Since tornado events can happen anywhere throughout the HMP planning area, the City





of Niederwald's future probability is assumed to be similar to the surrounding County area. The City can expect a tornado event approximately once every 4 years (on average) in the future, with up to an F3 magnitude.

Tornadoes: Impact

The City is comprised of approximately 40% factory-built housing to include modular, manufactured and mobile homes. Due to their permanent attachment to a chassis and transportability, these structures are more susceptible from impact from the extreme conditions caused by a tornado event.

There is not specific event data available for the City of Niederwald, from which impacts would be calculated. However, it can be assumed that impacts would be similar to those that the surrounding County area experiences.

Based on Hays County's past experience of tornadoes between F0 and F3 levels, if similar events were to happen in the future in the City, the type of impacts that the planning area could expect associated with those magnitudes would include (from least to greatest severity):

- Light Damage - Broken branches; shallow rooted trees pushed over; some chimney damage.
 - Moderate Damage - Surface damage to roofs; mobile homes pushed off foundation; moving vehicles pushed off the road.
 - Significant Damage - Frame houses have roof torn off; mobile homes completely destroyed; train boxcars overturned; large trees snapped or uprooted; smaller debris turned into missiles.
 - Severe Damage - Roofs completely torn off well-constructed buildings, along with some walls; majority of trees uprooted, trains overturned, vehicles lifted off the ground.
- (Tornado Facts, 2016)

Tornadoes: Vulnerability Summary

Niederwald has previously experienced debris accumulation on roadways during past windstorm events indicating vulnerability as extreme winds and debris accompany tornado events. Such incidents can cause impact on the ability of public safety officials to respond to emergency calls.

Additionally, Niederwald City Hall is a modular structure. These structures are more vulnerable to severe tornado damage than site-built structures. Significant structural damage to City Hall could lead to delays in getting assistance for members of the community.

There are no outdoor warning sirens, nor are there designated structures that can house residents that wish to seek shelter from the onset of a tornado. In addition, there is not a locally-run system or tool that can be utilized to contact residents with emergency notifications or information. Coordination can be made to use County reverse-9-1-1 and other communication resources available.





Expansive Soils

Expansive Soils: Location

Figure 2.3 within Chapter 2 (the risk assessment portion of the main plan document) shows the location of expansive soil areas for the City. The entire extent of the jurisdiction is classified as having over 50% of the area underlain with soils with abundant clays of high swelling potential, therefore all of the jurisdiction is equally at risk.

Expansive Soils: Previous Occurrences

There was no documentation of past site-specific past events of structural damage due to expansive soils from State or national datasets found. However, community testimony indicates that the instances of expansive soils are frequent and that the effects are evident throughout the community.

Expansive Soils: Extent and Probability

Based on the local community testimony on the frequency of expansive soil impacts, the probability of events occurring within the planning area is high (10 - 20 occurrences in the next 10 years affecting up to 20 structures).

Expansive Soils: Impact

The large areas of expansive soils within the Niederwald City Limits puts the structures and infrastructure within the community at risk to the damage caused by the hazard. The impact includes the cracking of foundations, the shifting of homes and the potential structural damage to modular, manufactured and mobile home structures.

Expansive Soils: Vulnerability Summary

The large amount of development expected in Niederwald, estimated to be a 400% increase within the next 5 years, necessitates the assurance of responsible development within the planning area, so as to reduce the amount of impact to the structures that are built within expansive soils areas. All new homes placed or built in the area are vulnerable to the effects of expansive soils. The City promotes mitigation through requiring foundation designs that are based on geotechnical survey data.



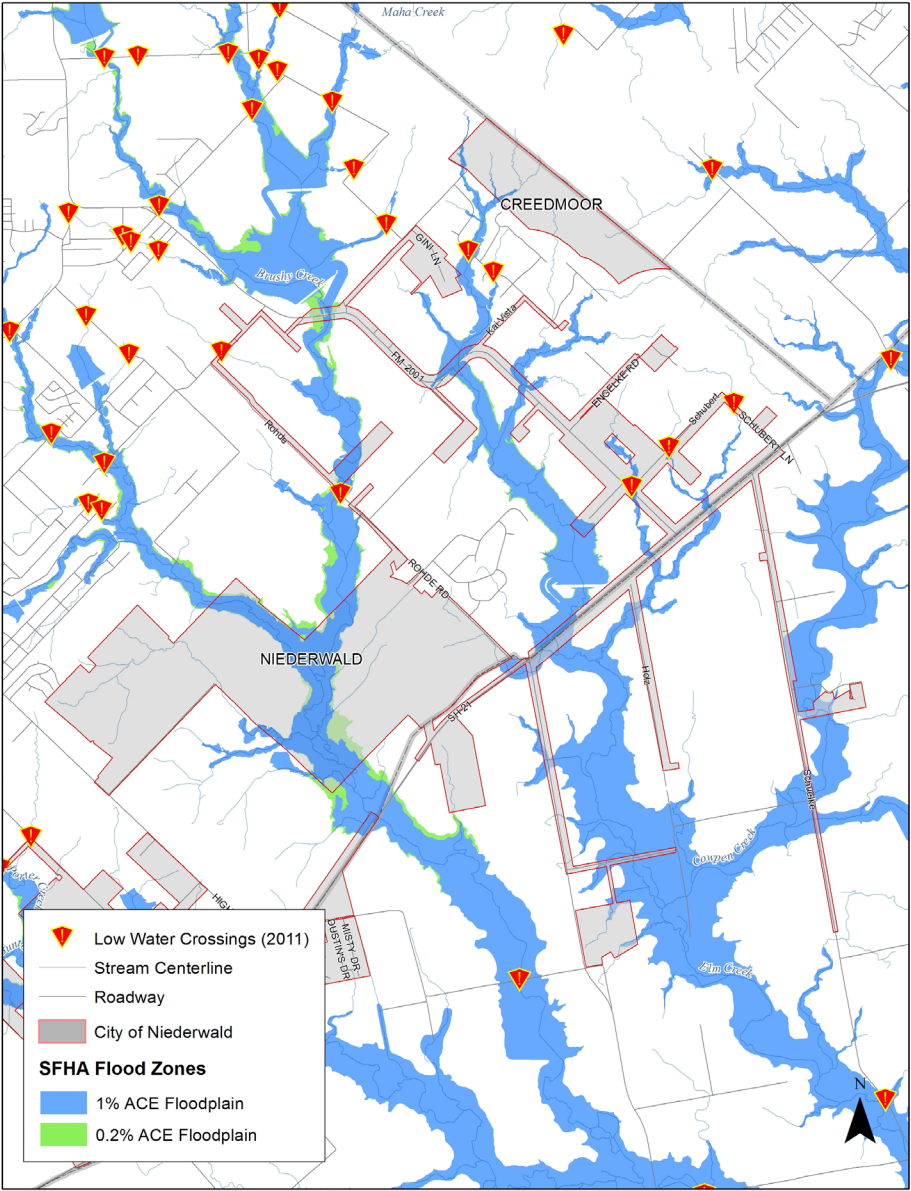
Floods



Floods: Location

The location of low water crossings, as well as the 1% (100-year) and 0.2% (500-year) Annual Chance Event (ACE) floodplains for the City of Niederwald are shown in Figure NW.3. This figure represents the areas most affected by riverine flooding and is based upon newly developed hydrologic and hydraulic analysis. The new analysis is considered the best information available to date. Table NW.6 provides the total acreage in the jurisdiction that is located in the 1% and 0.2% floodplains.

Figure NW.3, Special Flood Hazard Areas and Low Water Crossings, City of Niederwald



(Texas Natural Resources Information System, 2011)

Table NW.6, City of Niederwald Floodplain Acreage

Jurisdiction	100yr (1%) Floodplain Acres (Includes Floodway)	500yr (0.2%) Floodplain Acres (Includes 100yr)
City of Niederwald	393	449





Floods: Previous Occurrences

According to the NOAA Storm Events Database, there was 1 documented flood event listed for the City of Niederwald and 69 documented events listed for Hays County since the year 1997. While NOAA Storm Events Database lists events since 1997 for the County, events were not documented per jurisdiction until 2004. The flood event reported for the City of Niederwald is shown in Table NW.7.

Fatality, injury and damage amounts are shown in Table NW.7, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table NW.7, Flood Events, City of Niederwald

Location	Date	Type	Fatalities	Injuries	Property Damage	Crop Damage
Niederwald	2/4/2012	Flash Flood	0	0	0.00	0.00

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)

Floods: Extent

Flood extent is described through a combination of ground elevation, river heights, 100-year Water Surface Elevations (WSE's) and HAZUS depth grids. An example of flooding within the jurisdiction is the area along Brushy Creek downstream of its confluence with a tributary, in the southern part of the jurisdiction. This area is exposed to some of the greatest flood extents. This location has an approximate overbank ground elevation of 548 feet with an intersecting 100-year WSE of 552 feet. For a 100-year event, water depth of approximately 4 feet can be expected within this area. A further analysis of Brushy Creek is described below.

With Brushy Creek having an approximate in-channel elevation of 537 feet (per Light Detection and Ranging [LiDAR] data) and an intersecting 100-year WSE of approximately of 552 feet, flood depths would be up to 15 feet.

Floods: Probability

Probability has been calculated on the basis of NOAA reported events, as a standard, consistent calculation method for all hazards profiled with the Hays County HMP. Based on 1 reported event in 12 years, the City of Niederwald can expect a flood event approximately once every 12 years on average in the future with flood water depths up to 15 feet.

Floods: Impact

The following describes the inventory counts and building replacement values for the jurisdictional area.

Niederwald Building Counts			
Residential	Commercial	Other	Total
134	7	2	143

Niederwald Building Replacement Value		
Building (\$)	Content (\$)	Total (\$)
23,931,397	13,751,357	37,682,753





A Probabilistic 100-year Return Period HAZUS-MH 3.2 analysis was run on the City of Niederwald. HAZUS results are calculated to census blocks. This analysis utilized the best available LiDAR (COA 2012 and CAPCOG 2008) and depth grids. These blocks were then intersected with the City to run a weighted area analysis to get jurisdictional results. The following describes results from the 100-year Return (1% Annual Chance Event) weighted area analysis.

HAZUS-MH Results

General Building Stock Damage

HAZUS estimates that about 2 buildings will be at least moderately damaged in Niederwald. “At least moderately damaged” is defined by HAZUS as greater than 10% damage to a building. For this scenario, only residential buildings were at least moderately damaged.

Residential Buildings	Commercial Buildings	Other Buildings	Total Buildings
2	0	0	0

Building Related Losses

Exposed Value is the total building and content values for structures within the community. The exposed value for the community is \$37,682,753. The total building related losses were \$41,000 for this scenario. This represents 0.10% of the total replacement value of the community. Loss values are divided into building and content loss dollars.

Building Loss (\$)	Content Loss (\$)	Total Loss (\$)
28,000	13,000	41,000

Essential Facility Damage

HAZUS does not estimate any critical facilities or infrastructure interruption to be out of service for more than 1 day. The model estimates that 100% of community hospital beds would be available for use by patients already in the hospital and for those injured by an event.

Debris Generation

HAZUS estimates the amount of debris that will be generated in this scenario. The model estimates that a total of 1 ton of debris will be generated. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckload (with 1 to 25 tons per truck) to remove the building debris generated in this scenario.

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS also estimates the number of people displaced that will require accommodations in temporary public shelters. The model estimates 1 person will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 0 people will seek temporary shelter in public shelters.





Floods: Vulnerability Summary

As many of the homes in the community were built or placed before adoption of the Flood Damage Prevention Ordinance, there are many Pre-FIRM (structures built before the adoption of FEMA Flood Insurance Rate Maps) homes that are more vulnerable than those that were built within the standards of the ordinance. According to community verbal testimony, minimal flood damage was experienced to City property in 2015 when the only convenience store in the community experienced flooding. Impacts to this store affect not only community access to fuel and groceries, but also decreases the tax revenue earned for the period of closure.

Additionally, verbal testimony indicated that flooding has impacted the State-owned Highway 21 bridge, which was washed out as a result. There was an alternate route that members of the community and those passing through could utilize, but the routing through a residential area was inconvenient. The detouring of traffic through this area was also harmful to the residential streets due to large trucks.

National Flood Insurance Program Repetitive Loss (RL)

The City of Niederwald is a current participant in the National Flood Insurance Program (NFIP). As of September of 2016, the City does not have any listed RL or SRL properties according to FEMA RL/SRL data.



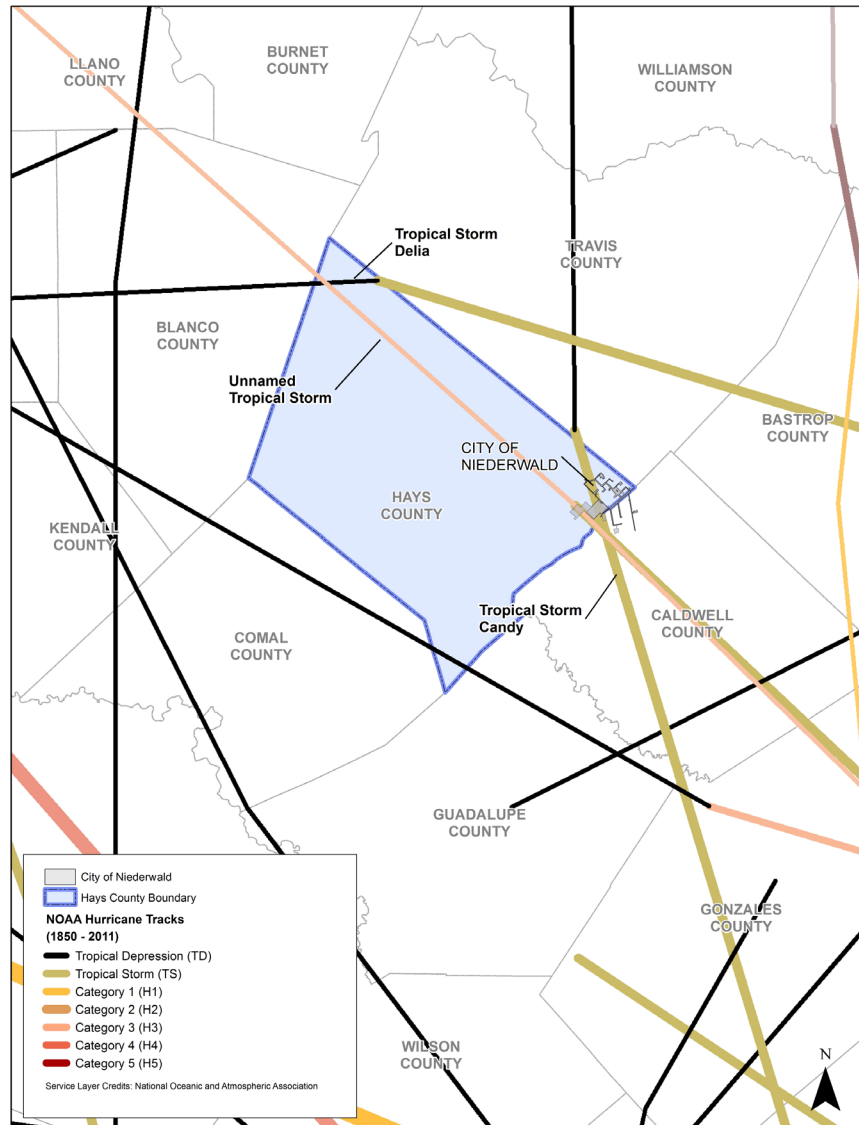


Hurricanes/Tropical Storms

Hurricanes/Tropical Storms: Location

Due to the regional nature of a hurricane or tropical storm event, the entire extent of the City of Niederwald is equally exposed to a hurricane or tropical storm. Figure NW.4 illustrates the location of the planning area with historical hurricane and tropical storm paths documented by NOAA's Hurricane Tracker from 1850 to 2011.

Figure NW.4, Historical Hurricane/Tropical Storm Paths, City of Niederwald



(National Oceanic and Atmospheric Administration, 2016)

Hurricanes/Tropical Storms: Previous Occurrences

The following events are listed from NOAA Storm Events Database for Tropical Storm Hermine and NOAA Hurricane Tracker for all other events. By the time most hurricanes reach the County, they are tropical storms, depressions or thunderstorms. Because hurricane and tropical storm events occur on a regional scale, all events listed for Hays County have been included, as they would impact the City of Niederwald.

July 13 to July 22, 1909 – An unnamed storm made landfall near Freeport, as a Category 3 Hurricane. This storm impacted Hays County and participating communities as a tropical depression with wind speeds up to 30 knots. No significant damages, injuries, or fatalities were reported for the City.





June 22 to June 26, 1968 – Tropical Storm Candy made landfall near Port Aransas. This storm impacted Hays County and participating communities as a tropical storm with wind speeds slowing to 30 knots as a tropical depression just after leaving the County. No significant damages, injuries, or fatalities were reported for the jurisdiction.

September 1 to September 7, 1973 – Tropical Storm Delia made landfall near the border of Brazoria and Matagorda Counties. This storm impacted Hays County and participating communities as a tropical storm with wind speeds slowing to 30 knots

as a tropical depression just after leaving the County. No significant damages, injuries, or fatalities were reported for the planning area.

September 6 to September 8, 2010 – According to the NOAA Storm Events Database, Tropical Storm Hermine made landfall near the Texas/Mexico border on the night of September 6. South Central Texas was hit very hard with widespread rains of 8 to 12 inches across much of the I-35 corridor from Austin down to San Antonio.

Hurricanes/Tropical Storms: Extent and Probability

The Saffir-Simpson Scale measures pressure, wind speed, and storm surge in 5 categories. According to the reported previous hurricane occurrences in the jurisdiction, the maximum hurricane extent experienced was categorized as a tropical storm. Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of storm extents.

Based on 4 reported events in 107 years, a hurricane or tropical storm event occurs approximately every 27 years on average in Hays County. Since hurricane and tropical storm events can happen anywhere throughout the HMP update area, the City of Niederwald's future probability is assumed to be similar to the surrounding County areas. In the future, the City can expect an event approximately once every 27 years on average, of up to a magnitude of a Tropical Storm at a 100-yr Max Wind Speed of 75 mph based on historical extents and HAZUS analysis.

Hurricanes/Tropical Storms: Impact

A Probabilistic 100-year Return Period HAZUS-MH 3.2 analysis was run for the City of Niederwald. The following describes the results of this analysis.

HAZUS-MH Results

General Building Stock Damage

The total property damage losses were \$156,245. The majority of damage can be expected to impact residential areas (98%). The remaining damages (2%) are for commercial, industrial, agricultural and religious buildings. While some building damage is experienced, it is estimated that no buildings will be completely destroyed or experience severe damage. Exposed Value is the total building and content values for structures within the community. Loss values are divided separately for building and content loss in dollars.

Exposed Value (\$) (Building + Content)	Building Loss (\$)	Content Loss (\$)	Total Loss (\$)
37,682,753	156,245	66	156,311



Essential Facility Damage

HAZUS does not estimate any critical facilities or infrastructure to be interrupted for more than 1 day on the day of the event. Additionally, the model estimates that 100% of hospital beds would be available for use by patients already in the hospital and for those injured by the hurricane.

Debris Generation

HAZUS estimates the amount of debris that will be generated by the hurricane at a total of 13 tons. Of the total amount, brick/wood comprises 100% of the total. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckload (with 1 to 25 tons per truck) to remove the building debris generated by the hurricane.

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of people displaced that will require accommodations in temporary public shelters. The model estimates no households to be displaced due to the hurricane. While there is an estimation of over \$156,000 in property damages expected, it is aforementioned that “no buildings would be completely destroyed or experience severe damage.” Residents would likely remain in their homes as damages were repaired, therefore no temporary shelter is needed.

Hurricanes/Tropical Storms: Vulnerability Summary

Similar to the impacts of windstorms, hailstorms, and lightning, Niederwald can expect to be impacted with debris and possible interruptions of critical infrastructure if the event is a stronger magnitude than those previously experienced by the City. In addition, the community’s proximity to IH 35 and State Highway 21 could lead to traffic delays caused by major coastal evacuation efforts.

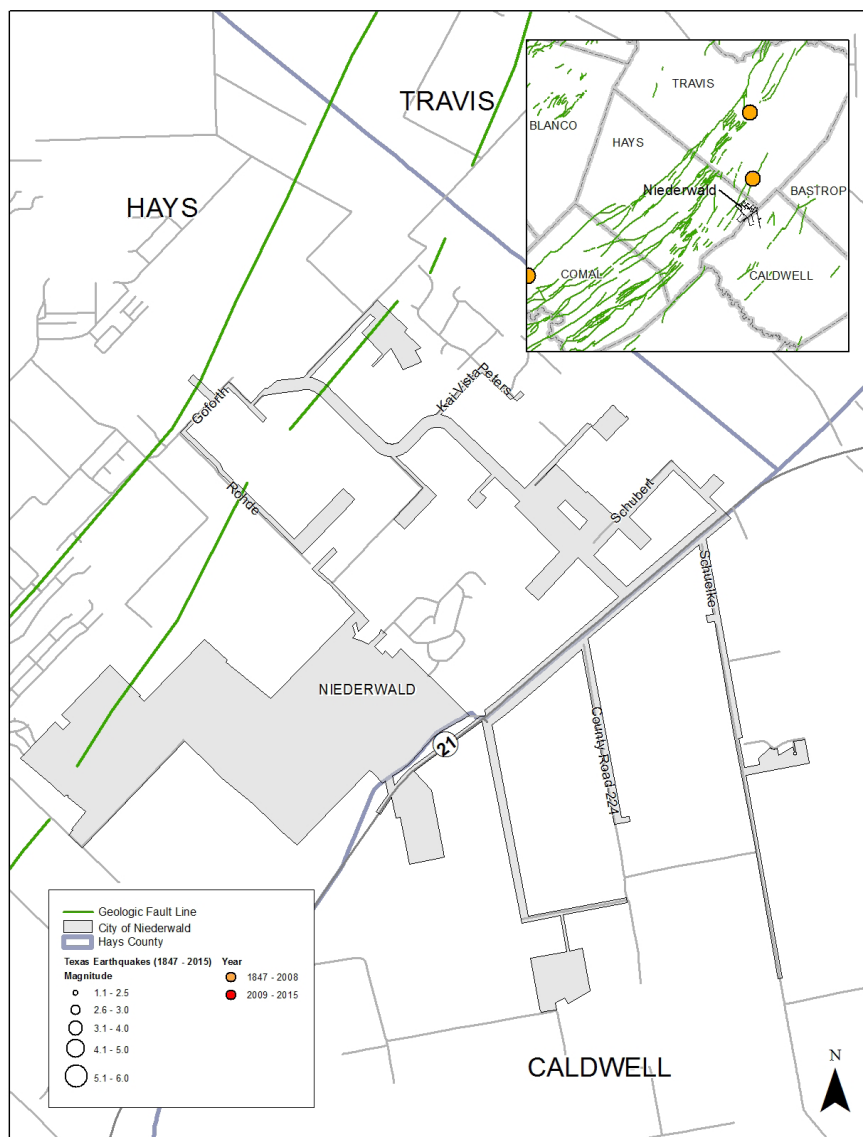


Earthquakes

Earthquakes: Location

Locations within proximity to fault lines are typically the areas most at risk for earthquakes. Figure NW.5 shows USGS documented fault lines and the locations of earthquakes from 1847 to 2015 in relation to the City of Niederwald.

Figure NW.5, Texas Earthquakes, 1847 – 2015, City of Niederwald



(USGS Earthquake Hazard Program, 2015)

Earthquakes: Previous Occurrences

According to USGS 1847 to 2015 data, there have been no documented earthquake events for the City of Niederwald, as illustrated in Figure NW.5.

Earthquakes: Extent and Probability

Earthquakes are measured by Peak Ground Acceleration (PGA). The HAZUS Max PGA for the planning area is 1.59% (see Earthquakes: Impact Section for a description of the HAZUS Analysis). This corresponds



to the Modified Mercalli Scale Category IV, with light perceived shaking and no potential structure damage. HAZUS measures PGA on a Census Tract Level. Cities within more than 1 census tract were assigned the highest PGA level to reflect the maximum possible extent. Refer to Chapter 2 for extent scale descriptions (the risk assessment portion of the main plan document).

As there have been no recorded previous occurrences of earthquakes for the City of Niederwald and the PGA is less than 2% for the area, the probability of an earthquake in the City in the future is low (0 - 1 occurrences in the next 10 years, at up to a 500yr PGA of 1.59%).

Earthquakes: Impact

The FEMA How-To Guidance, Understanding Your Risks (FEMA 386-2, page 1-7), suggests the earthquake hazard should be profiled if the PGA is greater than 3%g, where PGA is measured in the acceleration of gravity (g). The City's PGA is less than 3%g (0.03) and there have been no recorded earthquakes in or near the jurisdiction. Therefore, only a minimum level-1 HAZUS analysis was profiled using the 500-year probability event scenario. The HAZUS analysis produced a PGA of 1.59%. HAZUS scenario would produce \$0 in building damages (Residential, Commercial, Agriculture, Religious and Government) from an event. Critical facilities and infrastructure would not experience any loss of service. There would be no critical facilities or infrastructure that would experience moderate to complete damage. No debris would be generated from this event and no people or households would require temporary housing. There would be no moderate, extensive or completely damaged buildings by this event. HAZUS estimates no residents are expected to be displaced from their homes or will require accommodations in temporary public shelters due to the simulated earthquake. Additionally, there would be no casualties or fatalities from this event.

Earthquakes: Vulnerability Summary

While the probability of an earthquake in Niederwald is low, with no significant prior events on file, there are fault lines within the community that could cause impact if there were to be an increase in seismic activity in the area. There are 3 fault lines located within the jurisdiction according to USGS data. Niederwald could expect to be impacted with debris and possible utility interruptions if an event were to occur in this unlikely and unprecedented scenario. If an event were to incapacitate a roadway, emergency responders would be hindered from responding, thus leaving the residents who were affected at risk. The following local roadways are crossed by the USGS fault lines displayed on Figure NW.5: FM 2001, Rhode Road, and Gini Lane.





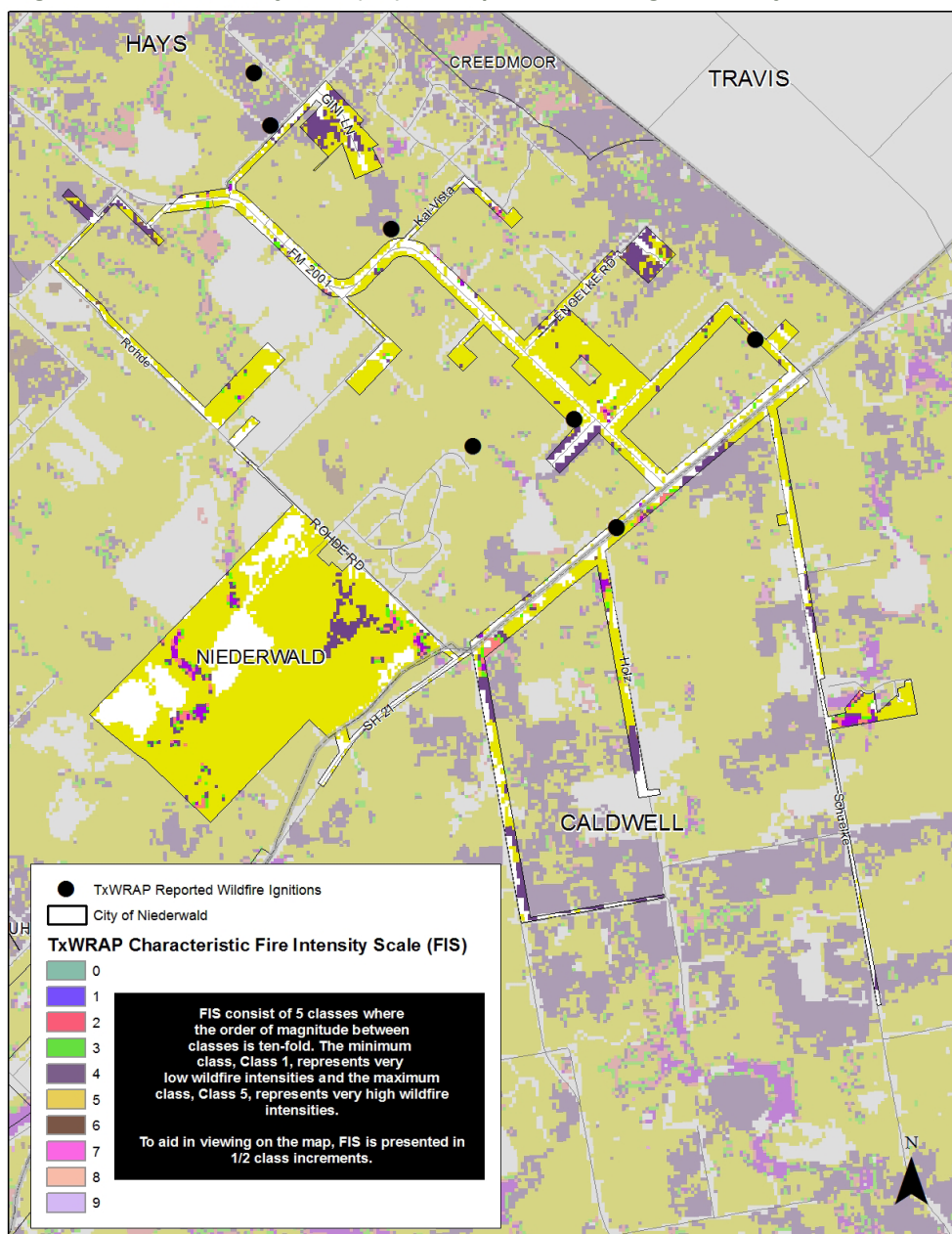
Page 21, 22, and 23 Dam/Levee Failure have been redacted from this copy of the plan.

Wildfires

Wildfires: Location

Wildfires can be ignited from a variety of sources including lightning or human activity such as campfires, smoking, arson, or equipment use. The Texas A&M Forest Service's Texas Wildfire Risk Assessment Portal (TxWRAP) can be used to help communities understand their wildfire risk. Figure NW.7 below shows the location of TxWRAP's documented wildfire occurrences with Fire Intensity Scale (FIS) classifications within the City of Niederwald. TxWRAP identifies FIS areas as those where wildfire fuels and associated potential dangerous fire behavior exist, based on a weighted average of 4 percentile weather categories.

Figure NW.7, Fire Intensity Scale (FIS) and Reported Wildfire Ignitions, City of Niederwald



(Texas A&M Forest Service, 2016)



Wildfires: Previous Occurrences

Table NW.9 shows the reported wildfire ignitions within the City of Niederwald, according to TxWRAP and USGS Federal Fire Occurrence data from the years 1980 to 2015.

Table NW.9, Wildfire Ignitions, City of Niederwald

FPA ID	Date	Fire Size (Acres)
SFO-TX01430601-35766411	8/2/2001	50
SFO-TX02240706-30061	2/12/2006	75
SFO-TX02240706-26597	2/12/2006	110

Wildfires: Extent and Probability

Table NW.10 lists the Fire Intensity Acreage for the City, according to the Texas A&M Forest Service TxWRAP Community Summary Report. Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of the FIS.

Table NW.10, TxWRAP Fire Intensity Acreage, City of Niederwald

Class	Acres	Percent
Non-Burnable	561	27.20%
1 (Very Low)	30	1.40%
1.5	38	1.80%
2 (Low)	6	0.30%
2.5	140	6.80%
3 (Moderate)	1,282	62.10%
3.5	6	0.30%
4 (High)	0	0.00%
4.5	0	0.00%
5 (Very High)	0	0.00%
Total	685	100.0 %

Based on 3 reported events in 35 years, the City of Niederwald's future probability for a wildfire event is approximately once every 11 to 12 years (on average), with up to a potential fire intensity of 3.5, or "Moderate" classification on the TxWRAP FIS.

Wildfires: Impact

Impact on the community can be measured using TxWRAP housing density levels within the WUI. Areas with a higher housing and population density would be affected to a greater extent than rural areas, especially in areas near burnable fuels. In the event of a wildfire in high density areas of population, residential structures would be damaged or destroyed, critical infrastructure such as water, sewer and electrical services would be damaged and interrupted and residents would experience injury or loss of life. Table NW.11 lists the population, percent of total population, WUI acreage and percent of WUI acreage for the City of Niederwald, according to the Texas A&M Forest Service TxWRAP Community Summary Report.



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Table NW.11, WUI Acreage, City of Niederwald

Housing Density	WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
LT 1hs/40ac	3	0.5 %	202	17.7 %
1hs/40ac to 1hs/20ac	11	1.7 %	121	10.6 %
1hs/20ac to 1hs/10ac	81	12.5 %	217	19.1 %
1hs/10ac to 1hs/5ac	231	35.5 %	330	29.0 %
1hs/5ac to 1hs/2ac	280	43.1 %	254	22.4 %
1hs/2ac to 3hs/1ac	44	6.8 %	13	1.2 %
GT 3hs/1ac	0	0.0 %	0	0.0 %
Total	650	100.0 %	1,136	100.0 %

Wildfires: Vulnerability Summary



According to community testimony, most of the fires that have been experienced recently within the Niederwald City limits have been grass fires that have not impacted life or structures. However, there is a risk resulting from the lack of trash service in the community. While contracts are being pursued, trash is typically burned. The burning within the City limits increases the risk of fires that could spread out of control and impact parts of the community that have large amounts of brush. The intermingling of residences with undeveloped tracts of land increases this

risk. There is a limited number of hydrants with a limited volume of water available for fire suppression. Hays/Caldwell ESD #1 transports water to each fire event within Niederwald and supplements their efforts with existing hydrants, and groundwater.



2.2 Risk Ranking Result

On January 12, 2017, members of the City of Niederwald MPC completed a questionnaire as part of the Hays County Hazard Mitigation Plan Update: Risk Assessment. The questions covered the risk associated with the hazards that affect each community based on the level of concern over each profiled hazard, the hazards' impact on health and safety, as well as impact to property and business continuity. The answers from this questionnaire were combined with public survey results on perception of risk. The values from both sources were analyzed using the Halff Risk Ranking Tool (details regarding the risk ranking tool are in Chapter 2, the risk assessment portion of the main plan document). The results provided a quantified ranking of risk, with values ranging from 0 to 100. The results for Niederwald are shown below (hazard values shown from highest risk to lowest):

Ranking Order	Hazard	Risk Ranking Value
1	Floods	81.6 (ranking tied for #1)
2	Wildfire	81.6 (ranking tied for #1)
3	Expansive Soils	81.6 (ranking tied for #1)
4	Drought	77.8
5	Extreme Heat	75.0
6	Tornadoes	58.1
7	Dam/Levee Failure	44.1
8	Sever Winter Storms	37.5
9	Hail Storms	33.8 (ranking tied for #9)
10	Wind Storms	33.8 (ranking tied for #9)
11	Lightning	33.8 (ranking tied for #9)
12	Earthquakes	30.0 (ranking tied for #12)
13	Hurricanes/Tropical Storms	30.0 (ranking tied for #12)
-	Land Subsidence	Not Profiled



Section 3: Mitigation Strategy

This section examines the community's ability to perform mitigation (a review of existing capabilities is shown in Table NW.12) and identifies specific mitigation actions to address vulnerabilities for each hazard profiled in the Hays County HMP Update. The mitigation strategy is the application of actions into an approach for performing structural and non-structural mitigation efforts within the jurisdiction. Actions are also prioritized and considered for incorporation into other community programs, regulations, projects or plans.

Completed and canceled actions are also included in a separate section for future reference.

3.1 Existing Capabilities

Table NW.12, Existing Capabilities

Capability Name	Capability Type	Ability to Expand/Improve
Mayor/Emergency Management Coordinator	Elected Official	Political support and funding for mitigation actions/ Management of City-level HMP updates. Could attend mitigation planning class offered by TDEM.
City Administrator	City Staff	Support for implementation of mitigation actions. Could attend mitigation planning class offered by TDEM.
Engineer/Floodplain Administrator	Consultant	Expertise in structural mitigation projects and compliance with Flood Damage Prevention Ordinance/Responsibility for continued participation in the NFIP. Attend advanced floodplain management training.
Sales Tax	Funding	Provides potential funding for hazard mitigation items.
Property Tax		
Permitting and Licensing Fees		
Chapter 211 of the Local Government Code: Zoning	Authority	State-level code that authorizes the City to regulate zoning.
Chapter 213 of the Local Government Code: Municipal Comprehensive Plans		State-level code that authorizes the City to adopt a comprehensive plan for the long-range development of the City.
Chapter 214 of the Local Government Code		State-level code that authorizes the City to have regulatory authority as it related to building code (such as structural integrity and plumbing).
City of Niederwald Ordinance 120406-B Zoning	Regulations	Regulates zoning in the City limits. (Niederwald, TX, 2006)
City of Niederwald Ordinance 12605-A Subdivision		Regulations for subdivisions in City Limits. (Niederwald, TX, 2000)
City of Niederwald Ordinance 71706 Site Development		Site development standards for residential and non-residential development. (Niederwald, TX, 2006)
City of Niederwald Engineering Design Standards		Adopted standards for design of structures for community. (Niederwald, TX, 2017)
City of Niederwald Budget	Funding	Can be reviewed for funding opportunities for community.



3.2 National Flood Insurance Program Participation

The City of Niederwald participates in the National Flood Insurance Program (NFIP). They do not have a Certified Floodplain Manager on staff, however, they contract out their floodplain management program function to a Professional Engineer that is trained in the administration of the program. The City has adopted the Federal and State standards within their Flood Damage Prevention Ordinance. The City will continue to explore options for higher standards and consider participation in the Community Rating System. The City of Niederwald has a total of 2 NFIP policies in force, as of January 2017, for a total of \$313,300 in total insurance coverage.

3.3 Mitigation Goals

The plan-level Mitigation Goals can be found in Chapter 3, The Mitigation Strategy portion of the Hays County HMP Update. These apply to each community and were mutually decided upon as the guiding goals for the development of actions in each planning area.



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3.4 Mitigation Actions

*E= Actions reducing risk to existing buildings and infrastructure

*F= Actions reducing risk to new development and redevelopment

Number/Title	Hazard	Item Description	Implementation Agency	
1 Flood Insurance Information Campaign (previously action 8 in 2011 plan, modified)	Floods	Promote the flood insurance program to lessen the number of structures uninsured from flood loss by providing citizens access to brochures about the NFIP at the local City Hall and links to resources on website.	City of Niederwald City Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services and free NFIP materials from FEMA publication warehouse		3 months	Not started	N/A
Cost and Benefit Considerations				
This project would indirectly benefit residents who need information about the hazard at little cost.				

Number/Title	Hazard	Item Description	Implementation Agency	
2 Residential Development Permit Enhancement for Flood Mitigation (previously action 2 in 2011 plan, modified)	Floods	Improve residential building permit to clarify floodplain information and reference required elevation certificates for development in Special Flood Hazard Area.	City of Niederwald City Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ -in-kind services		3 months	In progress	E/F
Cost and Benefit Considerations				
This project would be a low-cost method of ensuring that new development and substantial improvements are done with less risk for flood damage.				

Number/Title	Hazard	Item Description	Implementation Agency	
3 Floodplain Management Courses to receive certification (previously action 3 in 2011 plan, modified)	Floods	Send member of the staff or elected official to training in order to become a Certified Floodplain Manager.	City of Niederwald City Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$250/Existing staff/ in-kind services, cost of accommodations for FEMA E-273 Floodplain Course and CFM testing session		3 months	Not started	E/F
Cost and Benefit Considerations				
If attending the course at the Emergency Management Institute, the cost of the course would be very low. A benefit of continuing education for the Floodplain Administrator would be that it would help both new and existing residents through guidance on how to mitigate flood damages to development.				

Hays County Hazard Mitigation Plan, City of Niederwald Annex

Number/Title	Hazard	Item Description	Implementation Agency	
4 Emergency Communications-Weather Radio Installation at Public Buildings and Phone Tree Development (previously action 4 in 2011 plan)	Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Floods, Hurricanes/Tropical Storms, Earthquakes, Dam/Levee Failure, Wildfires	Installation of permanent weather radio and weather station at City of Niederwald structures, with back-up power source. Create phone tree with volunteer responsibilities for non-critical hazard call down messaging, such as drought alerts.	City of Niederwald City Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$500/Existing staff/ in-kind services		6 months	Not started	N/A
Cost and Benefit Considerations				
This low cost activity provides the ability for the local community to make rapid contact to provide their citizens messaging when hazard conditions are dangerous. This would benefit all citizens in the community.				

Number/Title	Hazard	Item Description	Implementation Agency	
5 StormReady Designation for Niederwald (previously action 6 in 2011 plan)	Windstorm, Hailstorm, Severe Winter Storms, Lightning, Hurricanes/Tropical Storms, Tornadoes, Floods	Application preparation and submission for StormReady designation from the National Weather Service that attests to the community's level of preparedness for severe winter.	Niederwald Emergency Planning	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		12 months	Delayed	N/A
Cost and Benefit Considerations				
This free application would benefit all members of the community in increasing the preparedness of the local government.				

Number/Title	Hazard	Item Description	Implementation Agency	
6 Increase Public Awareness of Hazard Mitigation (previously action 9 in 2011 plan)	Drought, Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Expansive Soils, Floods, Hurricanes/Tropical Storms, Earthquakes, Dam/Levee Failure, Wildfires	Creating a resource page on City website to promote information about the hazards that exist in the community and how to take mitigation actions at the individual level and in coordination with Special Utility District information on water conservation. Provide link to Haysinformed on local page.	City of Niederwald City Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		6 months	Ongoing	N/A
Cost and Benefit Considerations				
This free enhancement to the City's existing website would benefit all with internet access at little to no cost, except the staff resources required to do so.				



Hays County Hazard Mitigation Plan, City of Niederwald Annex

Number/Title	Hazard	Item Description	Implementation Agency	
7 Adopt Firewise hazard information from Hays County for mitigation activities (previously action 10 from 2011 plan, modified)	Wildfire	Formal adoption of Hays County Firewise maps and data for the purposes of planning activities to mitigate against wildfire risk.	City of Niederwald City Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		6 months	Not started	F
Cost and Benefit Considerations				
Building upon an existing and funded County level project, the community can take action to adopt Wildfire maps and data at no cost.				

Number/Title	Hazard	Item Description	Implementation Agency	
8 Adding Water Conservation to Ordinances/institution of Drought Contingency Plan as part of operations (previously actions 11 and 12 in 2011 plan, modified)	Drought	Adding drought conservation levels to ordinance to increase resiliency to drought conditions and also provide a method for monitoring drought trends on a local, regional and State-level through a drought contingency plan.	City of Niederwald City Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		6 months	Not started	E/F
Cost and Benefit Considerations				
With the sole cost of writing and adopting new ordinance language and publication of the Drought Monitor on the website, all citizens in the City would benefit from actions that would reduce the impact of drought.				

Number/Title	Hazard	Item Description	Implementation Agency	
9 Energy Prioritization Collaboration with Electric Cooperative (previously 13 in 2011 plan, modified)	Extreme Heat, Severe Winter Storms, Lightning, Windstorms, Tornadoes, Hurricanes/ Tropical Storms	Working with electricity providers to create a citizen registration system for requesting prioritization for power restoration according to special need or circumstance during hazards that could affect access to electricity.	City of Niederwald City Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services, Electric Companies		6 months	Not Started	N/A
Cost and Benefit Considerations				
This low cost project for prioritizing energy restoration for those with special needs within the community that would be impacted by hazards that are known for affecting impact to electrical power. All those with special needs from electrical resources would benefit.				



Hays County Hazard Mitigation Plan, City of Niederwald Annex

Number/Title	Hazard	Item Description	Implementation Agency	
10 De-icing Contract Research/ Plan Development (previously action 13 in 2011 plan)	Severe Winter Weather	Creation of a plan that provides established procedures and negotiated service providers and rates for ice removal for the 2 City streets.	City of Niederwald City Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		12 months	Not Started	N/A
Cost and Benefit Considerations				
By setting rates for ice removal for extreme cases of icy weather, the whole community could save money on potential price increases.				

Number/Title	Hazard	Item Description	Implementation Agency	
11 Coordination of new Limb and Large Item Pick-up day for Wildfire Mitigation (previously action 15 in 2011 plan, modified)	Wildfire, Severe Winter Weather, Lightning	Cross marketing of existing brush collection efforts from new trash vendor in order to promote mitigation.	City of Niederwald City Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services, trash provider		2 months	In Progress	N/A
Cost and Benefit Considerations				
At only the cost of the staff for coordination, the community cross-marketing new resources for collecting/ accepting brush in order to promote cleaning brush and dead trees to decrease fuel for wildfire, potential debris that could fall on power lines during freezing conditions and that could ignite during lightning strike. This would benefit any citizen that resides in a location with vegetation and trees. This will benefit the whole community.				

Number/Title	Hazard	Item Description	Implementation Agency	
12 Engineering review of City Hall (modular building) to ensure soundness against natural hazards	Flood, Tornadoes, Windstorm, Hurricanes/ Tropical Storms, Hailstorms	Contract a consultation from an engineer to review the new City Hall building to ensure its resiliency (modular building that holds community documents and archives).	City of Niederwald City Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$10,000/Existing staff/ in-kind services, cost of engineer study		12 months	Not started	E
Cost and Benefit Considerations				
The cost of this review will benefit the City government as it will assist with the assurance of the continuity of operations for the community during disaster conditions.				



Hays County Hazard Mitigation Plan, City of Niederwald Annex

Number/Title	Hazard	Item Description	Implementation Agency	
13 Evacuation Plans/ Alternate road consideration (previously action 19 in 2011 plan, modified)	Hurricanes/Tropical Storms, Floods, Dam/Levee Failure, Wildfire	Documentation of an evacuation plan that includes multiple exits.	City of Niederwald City Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind service, possible cost of buy-out for an easement of land to develop an additional emergency exit for the community, pursuit of grant funding for effort.		18 months	Not started	F
Cost and Benefit Considerations				
The cost of not establishing a way out of the community would greatly outweigh the cost of mitigating this risk of not being to get citizens out of danger.				

Number/Title	Hazard	Item Description	Implementation Agency	
14 Creation of Social Media Accounts for the City of Niederwald	Drought, Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Expansive Soils, Floods, Hurricanes/ Tropical Storms, Dam/Levee Failure, Wildfires	Opening Social Media accounts from multiple outlets to control emergency messaging and alerts for the community. No other communication methods are in place at the current time, besides County resources.	City of Niederwald City Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services, volunteer hours		3 months	In progress	N/A
Cost and Benefit Considerations				
This free action would create a way to send messaging out to all members of the community that utilize social media.				



Hays County Hazard Mitigation Plan, City of Niederwald Annex

Number/Title	Hazard	Item Description	Implementation Agency	
15 Expansive Soil Mitigation Measures	Expansive Soils	Adopting City road construction techniques that mitigate against expansive soils. Creating and providing an information sheet regarding expansive soils in the development permit packet given to developers and citizens building in the community. The sheet will provide risk information about the hazard and provide recommendations for soil compaction and engineered foundations, especially for non-site built structures.	City of Niederwald City Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
General fund/ Existing staff/ in-kind services, \$100 cost of printing for info sheets		3 months	Not started	E/F
Cost and Benefit Considerations				
The initial cost of roadway mitigation will eliminate future need for repairs, eliminate transportation disruption and reduce driver risk. This free effort would provide awareness and public information that will benefit those looking to perform new development and those who are improving or repairing existing property.				

Number/Title	Hazard	Item Description	Implementation Agency	
16 Dam Safety Evacuation Tabletop Exercise (previously action 18 in 2011 plan, modified)	Dam/ Levee Failure, Floods	Coordination with the US Army Corps of Engineers to participate in a tabletop exercise that provides the community leaders with insight on the USACE emergency procedures and evacuation plan.	USACE, City of Niederwald Mayor	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Cost covered by USACE, existing staff/ in-kind services		9 months	Not started	N/A
Cost and Benefit Considerations				
This request for a USACE tabletop will provide insight that will allow the community to inform all affected residents and visitors of the procedures for receiving warnings and seeking safety during emergency situations with the dam.				




3.5 Capabilities Assessment

Evaluation/Prioritization of Actions

Each action added to the plan was developed using the Mitigation Action Summary Worksheet shown in Figure NW.8.

Figure NW.8, Mitigation Action Summary Worksheet

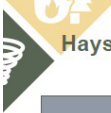


Hays County Hazard Mitigation Plan Update Process
Mitigation Action Summary Worksheet

Community Name:

Person completing questionnaire:

Mitigation Action/ Project Title	
Background/ Issue	
Opportunities for Integration	
Responsible Agency	
Partners	
Strategy for Existing Structures	



Hays County Hazard Mitigation Plan Update Process
Mitigation Action Summary Worksheet

Strategy for Future Development	
Potential Funding	
Cost Estimate (Values from "Measuring Costs" fields from Benefit and Cost Review Worksheet)	
Benefits (Statements from the "Difference" fields on the Benefit and Cost Review Worksheet)	
Timeline	
Priority (Based off Priority worksheet)	



Table NW.13, Mitigation Action Prioritization (with Hazards in order of highest priority to lowest)

Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community	Risk Ranking Score	Total Score
7. Adopt Firewise hazard information from Hays County for mitigation activities	1	1	1	1	0	1	1	1	1	1	82	91
6. Increase of Hazard Mitigation	1	1	1	1	0	1	1	1	0	1	82	90
13. Evacuation Plans/Alternate road consideration	1	0	1	1	1	0	1	1	0	1	82	89
5. StormReady Designation for Niederwald	1	0	1	1	0	0	1	1	0	1	82	88
2. Residential Development Permit Enhancement for Flood Mitigation	0	1	1	1	1	0	1	1	0	0	82	88
4. Emergency Communications-Phone Tree Development	1	0	1	1	0	0	1	1	0	1	82	88
11. Coordination of new Limb and Large Item Pick-up day	1	1	1	1	1	1	-1	1	0	0	82	88
8. Adding Water Conservation to Ordinances/institution of Drought Monitor as part of operations	1	0	1	1	0	1	1	1	1	1	78	86
1. Flood Insurance Information Campaign	0	0	1	1	0	0	1	1	0	0	82	86
3. Attend Local Floodplain Management Courses to receive certification	1	1	1	0	0	0	0	1	0	0	82	86
12. Engineering review of City Hall (modular building) to ensure soundness against natural hazards	1	1	1	-1	0	0	0	1	0	0	82	85
14. Creation of Social Media Accounts for the City of Niederwald	1	0	1	-1	-1	0	1	1	1	0	82	85
15. Expansive Soil Mitigation	0	1	1	-1	0	0	1	1	0	0	82	85
9. Energy Prioritization Collaboration with Electric Cooperative	1	0	1	0	-1	0	1	1	0	0	75	78
16. Dam Safety Evacuation Tabletop Exercise	1	1	1	1	1	1	0	1	0	1	44	52
10. De-icing Contract Research/ Plan Development	1	0	1	1	1	0	1	1	0	0	38	44



Hays County Hazard Mitigation Plan, City of Niederwald Annex

Mitigation Actions by Hazard

The mitigation actions are shown with corresponding hazards in Table NW.14 below.

Table NW.14, Mitigation Action Impact, City of Niederwald

Action Number	Drought	Extreme Heat	Severe Winter Storms	Lightning	Hailstorms	Windstorms	Tornadoes	Expansive Soils	Floods	Land Subsidence	Hurricanes/ Tropical Storms	Earthquakes	Dam/ Levee Failure	Wildfire
1									X					
2									X					
3									X					
4		X	X	X	X	X	X		X		X	X	X	X
5			X	X	X	X	X		X		X			
6	X	X	X	X	X	X	X	X	X		X	X	X	X
7														X
8	X													
9		X	X	X		X	X				X			
10			X											
11			X	X										X
12					X	X	X		X		X			
13									X		X		X	X
14	X	X	X	X	X	X	X	X	X		X	X	X	X
15								X						
16									X				X	



3.6 Integration Efforts

Table NW.15 captures ways that the risk assessment, mitigation goals and actions can be integrated into other City of Niederwald documents, programs and regulations.

Table NW.15, Plan Integration Efforts, City of Niederwald

Name of Document	Type	Item Type	Process for Integration
Niederwald Budget	Document	Action	Seek funding for Floodplain Administrator training within existing budget line item: 6330-Seminars and Continue Education. (Action 3) Propose line item change to City Council and increase approved during fiscal year budget activities.
HaysInformed.com	Program	Action	Coordinate with City website administrator to link to existing Hays County HaysInformed.com emergency preparedness/awareness page when creating Public Awareness Page for hazards on Niederwald website. (Action 6)
Waste Management			Incorporate Large Item Pick up into negotiations for new trash service vendor that is currently in progress of being selected. (Action 11) Advertise wildfire mitigation measures through trash billing mailers while announcing large-item pick-up events.
Niederwald Social Media			Pre-write Hazard Mitigation posts/tweets for year and provide to social media coordinator volunteer for posting on a regular basis once social media platforms are established formally. (Actions 6 & 14)
Hazard Mitigation Grant Program (HMGP)	Funding	Action	Identify actions that can be funded through new and existing grant awards. Review existing mitigation actions for eligibility for the grant program, to include Benefit Cost consideration. Prepare grant application documents in advance to prepare for future grant application periods.
Pre-Disaster Mitigation (PDM)			Process involves identification of actions from Plan; obtaining Council approval to apply; notification of interest in grant to the public; completion of application for funding; if awarded, obtaining Council approval to accept; if accepted, administration of funds and implementation of project.
Flood Mitigation Assistance (FMA)			
TWDB Flood Protection Planning (FPP) Grant			Identify actions that can be funded through new and existing loans. Review existing mitigation actions for eligibility for the loan program, to include Benefit Cost consideration. Prepare loan application documents in advance to prepare for future application periods.
TWDB Clean Water State Revolving Fund (CWSRF)			
Texas Water Development Fund (DFund)			Process involves obtaining Council approval to apply; notification of interest in loan to the public; completion of application for loan; if awarded, obtaining Council approval to accept; if accepted, administration of funds and implementation of project.



Hays County Hazard Mitigation Plan, City of Niederwald Annex

Incorporation Achievements Since Previous Plan Update

Data, information, and mitigation goals and actions were not integrated into other planning mechanisms in the last 5 years prior to this update due to a lack of funding and resources.



Section 4: Finalize Plan Update (Review, Evaluation, and Implementation)

4.1 Changes in Development

The City of Niederwald is on the cusp of significant changes. The community expects and hopes for a 400% increase in residents in the coming planning period. The increase will be in several planned subdivisions. With the influx of residents, the community is preparing for many permitting applications and are anticipating being stewards for safe growth for their community. The sudden increase of population and development could increase vulnerability.

4.2 Progress in Mitigation Efforts

Past Mitigation Action Progress Reports Summary - Completed and Canceled

2011 Action Number	Hazard	Item Description	Lead Department
1	Flood	Increase the number of Hays County communities that participate in the NFIP	City of Niederwald
Cost Estimate/Funding		Schedule	Status as of 2017
Cost and Funding: Existing staff resources, no cost		Completed	Completed
Cost Effectiveness			
Not independently cost-effective			

2011 Action Number	Hazard	Item Description	Lead Department
5	All hazard	Development of and maintenance of County-wide and individual community HAZMAP Plans	City of Niederwald
Cost Estimate/Funding		Schedule	Status as of 2017
Existing staff resources		Original Plan adopted on 4/20/2004. Update in 2011	Completed.
Cost Effectiveness			
Not independently cost-effective			

2011 Action Number	Hazard	Item Description	Lead Department
16	Floods, thunderstorms, high winds, tornadoes, seismic	Upgrades to At-Risk Structures	City of Niederwald
Cost Estimate/Funding		Schedule	Status as of 2017
Varies depending on measure. Funding from General Fund or FEMA grant program/s		TBD based on study	Canceled. Not fiscally feasible. More regulator measures adopted.
Cost Effectiveness			
Cost-effectiveness will vary with level of risk and project cost			



4.3 Changes in Priorities

Plan-level priority changes are reflected in the changes to the plan-level goals shown in Chapter 3: Mitigation Strategy within the Main Plan document. As the community expects to grow, it is showing an increase in concern for public safety, as is indicated in the ranking of public safety actions in the prioritization of mitigation actions. Higher population counts call for greater levels of responsibility for the community. In addition, a concern for expansive soils also shows that the community hopes to mitigate the effects of this hazard for incoming residents and their structures.



Section 5: Approval and Adoption

5.1 Approval and Adoption Procedure

The procedures for approval and adoption are described in Chapter 4.1 of the main plan document.

Table NW.16, Municipal Jurisdiction Adoption Date

Municipality	APA Date	Adoption Date
City of Niederwald		





Jurisdiction Adoption Documentation Placeholder

References

- National Fire Protection Association. (2013, June). NFPA News & Research. Retrieved from Lightning Fires and Lightning Strikes: <http://www.nfpa.org/news-and-research/fire-statistics-and-reports/fire-statistics/fire-causes/lightning-fires-and-lightning-strikes>
- National Highway Traffic Safety Administration. (2017, 03 11). Traffic Safety Facts. Retrieved from Texas 2011-2015: <https://cdan.nhtsa.gov/SASStoredProcess/guest>
- National Oceanic and Atmospheric Administration. (2016). Historical Hurricane Tracks. Retrieved from National Oceanic and Atmospheric Administration Coastal Management: <https://coast.noaa.gov/hurricanes/>
- National Oceanic and Atmospheric Administration Storm Event Database. (2016, 12 01). National Centers for Environmental Information. Retrieved from Data Access: <https://www.ncdc.noaa.gov/data-access>
- Niederwald, Tx. (2000). Ordinances: Niederwald Codes and Enforcement. Retrieved from Ordinance 12605-A Subdivision : <http://niederwaldtx.com/sites/default/files/NIEDERWALD%20SUBDIVISION%20ORDINANCE.pdf>
- Niederwald, TX. (2006, 07 17). Ordinance: Niederwald Codes and Enforcement. Retrieved from Ordinance 71706 Site Development : <http://niederwaldtx.com/sites/default/files/SITE-DEVELOPMENT-ORDINANCE.pdf>
- Niederwald, TX. (2006, 12). Ordinances: Niederwald Codes and Enforcement. Retrieved from Ordinance No. 120406-B: <http://niederwaldtx.com/sites/default/files/NIEDERWALD-ZONING-ORDINANCE-120406-B.pdf>
- Niederwald, TX. (2017, 03 20). Ordinances: Niederwald Codes and Enforcement. Retrieved from Engineering Design Standards: <http://niederwaldtx.com/sites/default/files/Niederwald%20-%20Engineering%20Design%20Standards%28Final%20Version11-30-04%29%20%282%29.pdf>
- Texas A&M Forest Service. (2016, 12 01). Wildfire Risk Assessment Portal. Retrieved from Public Viewer: <https://www.texaswildfirerisk.com/>
- Texas Department of Transportation. (2017, 03 11). Crash Records Information System. Retrieved from C.R.I.S Query: <https://cris.dot.state.tx.us/public/Query/#/public/welcome>
- Texas Natural Resources Information System. (2011). TNRIS Data Catalog Low Water Crossings. Retrieved from TNRIS: <https://tnris.org/data-catalog>
- Tornado Facts. (2016, 03 16). Tornado Facts and Information . Retrieved from Tornado Scale: <http://www.tornadofacts.net/tornado-scale.php>
- USGS Earthquake Hazard Program. (2015). USGS Earthquake Hazard Program. Retrieved from USGS: <https://earthquake.usgs.gov/data/>

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City of San Marcos
Hays County Hazard
Mitigation Plan Update
2018



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City of San Marcos Annex

Section 1: Organize and Review

This section contains a brief description of the City of San Marcos and its jurisdictional features. In addition, Section 1 contains the following details regarding San Marcos':

- participation in the Hays County HMP Update process,
- stakeholder engagement,
- public outreach strategy,
- incorporation efforts and
- plan maintenance procedures.

*Population :	44,805
Size of Community:	34.26 sq. mi
*Population over 65 years old	3,013
*Population under 16 years old	6,406
*Economically Disadvantaged Population (\$0-\$20k)	6,292

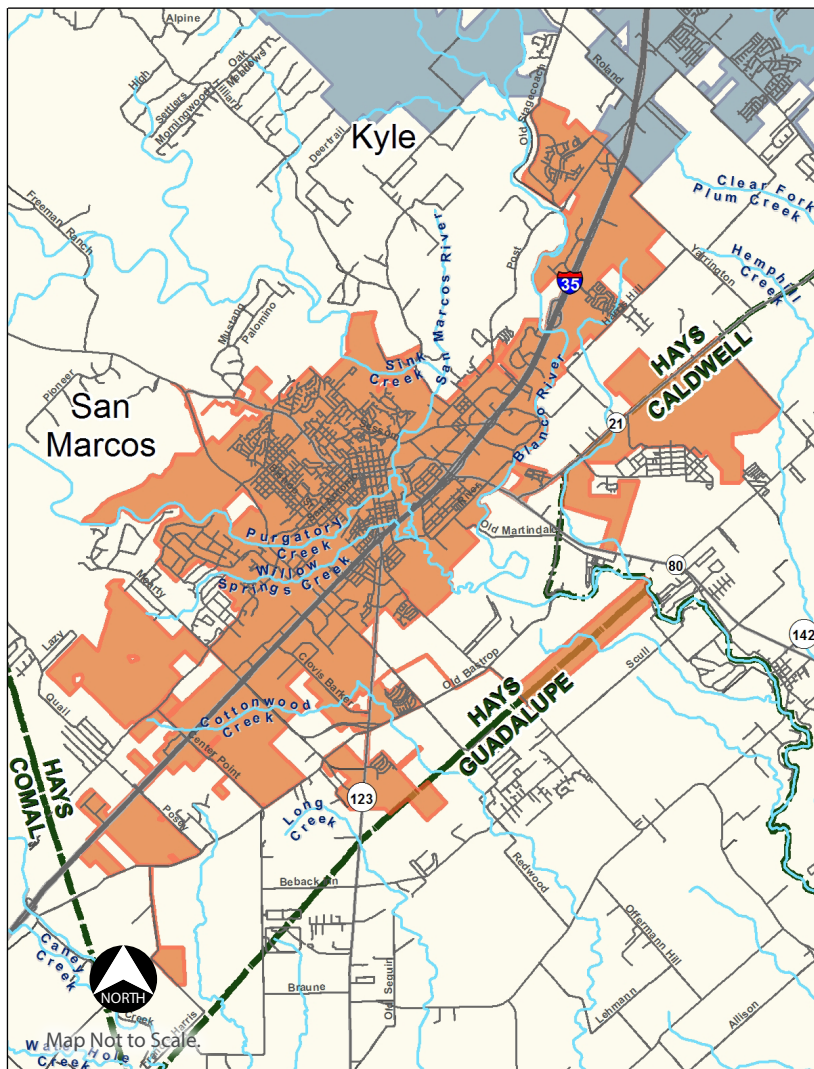
San Marcos is serviced by the following responders:

Fire/EMS - San Marcos Fire Department/San Marcos Hays County EMS

Law Enforcement - San Marcos Police Department

**HAZUS-MH 3.2 Updated Census 2010 Population Estimates*

Figure SM.1, City of San Marcos Planning Area



1.1 Community Description

When planning, it is important to take into account the characteristics that make a community unique. Consideration of unique needs when it comes to mitigating or recovering from natural hazards ensures that all members of the community and their needs are addressed.

San Marcos is known as the heart of Central Texas, located exactly midway between the cities of Austin and San Antonio, Texas on Interstate Highway 35 (IH-35). Located along the San Marcos River, San Marcos is the county seat for Hays County. The community has the largest population throughout the County and is home to Texas State University. Incorporated in 1877, the community follows a Council-Manager form of City Government made up of a Mayor and 6 Council Members.

The City is supported by 670 employees and known for its arts and history and is a popular tourist destination fueled by river activities, shopping and other attractions. In 2015, the City was named the fastest growing city in the United States with a population of 50,000 residents or more, and earned the designation for 3 years running. (Time, 2015)

Hays County Hazard Mitigation Plan, City of San Marcos Annex



San Marcos is served by San Marcos Consolidated ISD (SMCISD), which has 12 campuses throughout the City. There are 36,000 people enrolled at Texas State University as of 2015. In 2013, San Marcos permitted \$235,940,463 in building permit values between the months of January and August. Most populated in the County, and still growing at an impressive rate, San Marcos is also home to 1,700 acres of parkland and open space.

Table SM.1 shows the City's major employers while Table SM.2 lists San Marcos main utility providers.

Table SM.1, Major Employers

Business Type	Name of Employer
Education	Texas State University
Retail	Amazon
Retail	San Marcos Premium Outlets
Retail	Tanger Factory Outlets
Education	San Marcos Consolidated Independent School District
Government	Hays County
Manufacturing	CFAN
Medical	Central Texas Medical Center (CTMC)
Retail	H-E-B Distribution Center
Government	City of San Marcos

(Greater San Marcos Partnership, 2017)

Table SM.2, Utility Providers

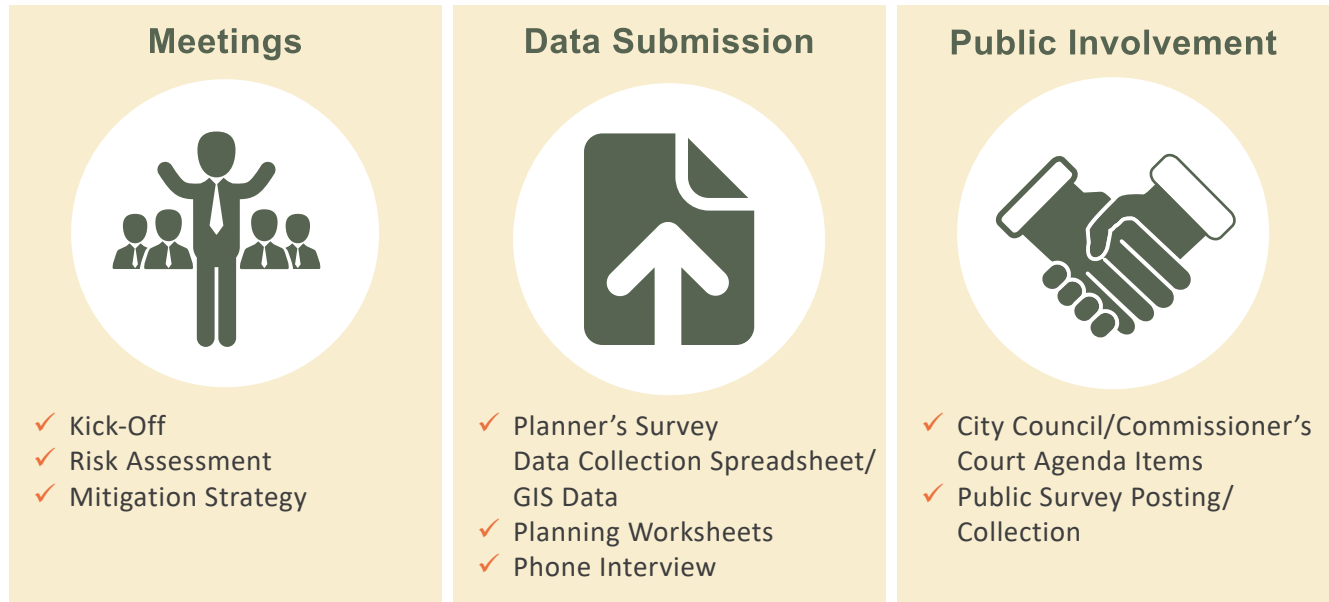
Type	Provider
Electric	San Marcos Electric Utility/Bluebonnet Electric/ Pedernales Electric Cooperative (PEC)
Water	San Marcos Water-Wastewater Utility



Community Planning Involvement

MPC planning activities for the Hays County Hazard Mitigation Plan (HMP) Update are captured in Figure SM.2, which utilizes check-marks to indicate each of the activities that were completed by the San Marcos MPC members.

Figure SM.2, City of San Marcos Plan Participation





1.2 Outreach Strategy

The City of San Marcos was very active in the following outreach activities used to request public participation in the Hays County Hazard Mitigation Plan Update.

Public Survey Promotion

San Marcos advertised the Hays County Hazard Mitigation Plan Update Public Survey on the City of San Marcos homepage of www.sanmarcostx.gov.

As of March 10, 2017, San Marcos had 160 residents respond to the public survey. Details on how the survey data was directly incorporated into the risk ranking process for hazards is included in Chapter 2, the risk assessment portion of the main plan document.

City Council Meeting Announcement

On February 7, 2017, the City Senior Engineer presented information on the Hays County Hazard Mitigation Plan Update to the San Marcos City Council. Elected officials, local agency leaders and members of the public attended the meeting. The Council agenda and item report for this presentation are included in Plan Appendix A of the Hays County HMP Update.

Plan Phase Newsletters

San Marcos was provided with newsletters at each phase of the planning process in order to be able to share updates on the planning process with stakeholders, City staff and the public. Copies of the newsletters can be found in Plan Appendix A.

Plan Draft Public Review and Comment Period

The link to the draft Hays County HMP (hosted on the Hays County Office of Emergency Services page) was posted on the City of San Marcos website from July 12, 2017 until July 26, 2017 and a hard copy was placed in the San Marcos City Hall for public review. No public comments were received during this review period.



1.3 Incorporation of Sources

In addition to stakeholder and public input, the MPC also reviewed other City planning resources that could provide useful information for the plan update process. Table SM.3 lists the documents reviewed and how they were considered for incorporation in the updated plan.

Table SM.3, Review/Incorporation of Sources

Name of Document	Type	How Incorporated
2013 State of Texas Hazard Mitigation Plan	Plan	Utilized hazard definitions and hazard classification names.
Flood Insurance Study	Study	Incorporated best available hydraulic and hydrologic study results for flood hazard profile.
San Marcos Code of Ordinances	Regulations	<p>Reviewed for opportunities to enhance for mitigation (Municode, 2017)</p> <ul style="list-style-type: none"> • General Ordinances Chapter 39- Flood Damage Prevention- methods for reducing flood losses. • General Ordinances Chapter 86/Article 8- Drainage Utility Fee. • Land Development Code Chapter 4- Zoning Regulations. • Land Development Code Chapter 7- Public Facilities Standards. • Land Development Code Chapter 3- Comprehensive Planning. • Land Development Code Chapter 1- Development Procedures. • Land Development Code Chapter 5- Environmental Regulations. • General Ordinances Chapter 26- Civil Emergencies. • General Ordinances Chapter 14- Buildings and Building Regulations. • General Ordinances Chapter 38- Fire Prevention and Protection. • General Ordinances Chapter 62- Public Safety. • Land Development Code Chapter 7- Public Facilities Standards. • General Ordinances Chapter 30- Emergency Services.
San Marcos Flood Protection Plan 2007	Plan	<p>Reviewed plan for possible incorporation of suggested mitigation actions from the Plan</p> <p>Structural Flood Controls</p> <ul style="list-style-type: none"> • Blanco River Watershed <ul style="list-style-type: none"> • Channel and overbank maintenance/peak flow diversion to Bypass Creek • Cottonwood Creek • Detention upstream of IH-35 <ul style="list-style-type: none"> • Floodplain ordinances and regulations enhanced • Purgatory Creek <ul style="list-style-type: none"> • Hopkins Street culvert improvement • Castle Creek Drive culvert improvement • Expansion of NRCS Reservoir No. 5 flood storage volume • Schulle Canyon culvert improvement • Sessom Creek culvert improvement • Willow Springs Creek <ul style="list-style-type: none"> • Downstream regional detention pond • Upstream regional detention pond • Flood Early Warning System • Streamflow Gage Network • Various flood community initiatives (Espey Consultants, 2007)



Table SM.3, Review/Incorporation of Sources, (cont.)

Name of Document	Type	How Incorporated
San Marcos Water Master Plan Update 2016	Plan	Reviewed for actions that were applicable for mitigation purposes. The plan ran modeling to simulate future conditions and identify the projects that would be needed to allow the City to continue to provide a safe reliable source of water for its customers. (Alan Plummer Associates, Inc., 2016)
San Marcos Transportation Master Plan		<p>Reviewed actions that were ranked as favorable for Wetland/ Floodplain in the plan for possible incorporation</p> <ul style="list-style-type: none"> • R-3 Realign Holland and Academy to provide Sessom connection to RM 12 • R-4 Widen Post Road from Aquarena Springs to northern study area limit to 4 lanes (6 lanes needed w/o Loop) • R-5 Extend LBJ northward from Bishop Street to W. Outer Loop as 2 lane section • R-7 Construct 4-lane freeway as E. Outer Loop • R-11 Extend River Ridge Parkway west as 2 lane section (IH 35 to Post Road) • R-13 Extend Beback Inn Road (Old Bastrop Hwy. to CenterPoint) as 2 lane section • R-14 Widen RM 12 from W. Outer Loop to Wimberley to 6 lanes (TxDOT) • R-15 Add U-Turn Lane for Transit Center Access • R-16 Widen River Rd. (SH 80 to new connection from Aquarena Springs) 4 lane section • R-17 Widen Comanche Street to 4 lanes (Sessom to Hopkins); improve 2-lane section (Hopkins to MLK) • R-18 Complete missing sections of University Drive (4 lane section) from Guadalupe to Comanche; long range complete section from Comanche to RM 12 • R-24 Extend Craddock South to Wonder World Drive (2 lane section) • R-25 Widen Thorpe Lane to 5 lanes from Aquarena Springs Dr - Hopkins St • R-26 Widen Hutchison to 3 lanes - CM Allen Pkwy to Moore St • R-27 Widen IH 35 overpass to 6 lanes • R-28 Widen Uhland to 3-4 lane section • R-29 Extend River Ridge Parkway from Post Road to Lime Kiln Road • R-32 Extend Stagecoach Trail (Craddock to W. Outer Loop) • R-33 Construct Purgatory Parkway between Craddock South and Stagecoach Trail western extension • R-34 Widen Charles Austin to 4 lane undivided • R-35 Widen FM 621 to 3 lanes from SH 123 to Old Bastrop Hwy. • R-38 Widen IH 35 to 8 main lanes/3-lane frontage roads throughout ETJ <p>(Wilbur Smith Associates, 2004)</p>

Table SM.3, Review/Incorporation of Sources, (cont.)

Name of Document	Type	How Incorporated
Vision San Marcos: A River Runs Through Us- Comprehensive Plan	Plan	<p>Reviewed community comprehensive plan for goals, objectives and actions to consider for incorporation in HMP.</p> <ul style="list-style-type: none"> • Economic Development Goal 7/Objective- Engage appropriate partners to create a citywide strategy to better protect the area's natural resources and ecosystem's history. • Environment & Resource Protection Goal 1/Objectives- Adopt watershed specific regulations based on scientific understanding of water quality impacts. Develop a regional detention and water quality strategy. • Environment & Resource Protection Goal 2/Objective- Develop a coordinated tree preservation and planting program. • Environment & Resource Protection Goal 3/Objective- Develop re-claimed water infrastructure plan for activity nodes. • Environment & Resource Protection Goal 4/Objectives- Adopt comprehensive floodplain development regulations, Implement an education and outreach program that identifies, and alerts citizens to, risks and responses to all hazards, in coordination with other governmental entities. • Land Use Goal 3/Objectives- Implement rain water retention and storm water Best Management Practices, track and monitor pervious cover at the watershed level. • Parks, Public Services & Facilities Goal 5/Objectives- Study and address homelessness issues through qualitative and/or quantitative analysis. <p>(City of San Marcos, 2013)</p>



Section 2: Risk Assessment

City of San Marcos Jurisdictional Hazards

This section contains San Marcos' hazard profiles for each natural hazard included in the Hays County HMP Update. Profiles include:

- Location - the area where the hazard is known to occur
- Previous Occurrences - a history of reported events for the hazard
- Significant Previous Occurrences (when applicable) - notable hazard events within the community
- Extent - the strength or magnitude of the hazard
- Probability - the likelihood of the hazard event occurring in the future
- Impact - the consequence or effect (or possible effect) of hazard events
- Vulnerability Summary - identification of structures, systems, populations or assets susceptible to loss or damage and how they could be impacted

Hazard descriptions and extent scales for hazard magnitudes, are found in Chapter 2, the risk assessment portion of the main plan document.

When available, data specific to San Marcos was used for hazard analysis. When no instances were reported specifically for the jurisdiction for regional hazards, County-wide data was applied.

State and national datasets were used to determine occurrence, extent, and the respective probabilities, rather than verbal testimonies, in an effort to retain data consistency. For some hazards, the National Oceanic and Atmospheric Administration (NOAA) Storm Events Database was used as the most comprehensive data available for hazards. The Storm Events Database does not always reflect the most recent totals for fatality, injury and damage amounts for previous hazard occurrences. The Previous Occurrences paragraphs identify instances in which this may occur. Verbal testimony, when available, was integrated into impact or vulnerability summaries to account for updates in this data.

2.1 Hazard Profiles

Hazards profiled within the Risk Assessment include:

- Drought - Within Chapter 2, the risk assessment portion of main plan document.
- Extreme Heat - Within Chapter 2, the risk assessment portion of main plan document.
- Severe Winter Storms - Within Chapter 2, the risk assessment portion of main plan document.
- Lightning - Within Chapter 2, the risk assessment portion of main plan document.
- Hailstorms
- Windstorms
- Tornadoes
- Expansive Soils
- Floods
- Hurricanes/Tropical Storms
- Earthquakes
- Dam/Levee Failure
- Wildfires





Hailstorms

Hailstorms: Location

The entire extent of the City of San Marcos is exposed to some degree of hail hazard. Since hail can occur at any location, hail events could be experienced anywhere within the planning area.

Hailstorms: Previous Occurrences

According to the NOAA Storm Events Database, there were 23 documented hail events listed for the City of San Marcos and 57 documented events listed for Hays County and its unincorporated jurisdictions from year 1967. While the NOAA Storm Events Database lists events since 1967 for the County, events were not documented per jurisdiction since the year 1993.

Hailstorms: Extent and Probability

The Tornado and Storm Research Organization (TORRO) created a hail extent index to measure hail called the Hailstorm Intensity Scale. According to the reported previous hail occurrences in the planning area, the maximum hail extent experienced was up to 4.5 in., or 114.30 mm. in diameter. This size corresponds to a TORRO Hailstorm Intensity Scale classification of “Super Hailstorm.” Refer to Chapter 2, the risk assessment portion of the main plan document, for TORRO hail extent scale descriptions.

Based on 23 reported events in 23 years, the City of San Marcos can expect a hail event approximately once every year (on average) in the future, with hail up to 4.5 in., or 114.30 mm. in diameter, corresponding to a TORRO Hailstorm Intensity Scale classification of “Super Hailstorm.”

Hailstorms: Impact

Hail events in the area have been reported to cause up to \$100,000,000 in property damages and \$500,000 in crop damages according to NOAA reports for the City. Additional potential impacts can be determined based on the maximum hail extent experienced (114.30 mm), where the TORRO Hailstorm Intensity Scale indicates that impact can be expected to include any of the following:

- Varying degrees of damage to vegetation and crops
- Damage to plastic structures
- Varying degrees of damage to glass
- Paint and wood scored
- Vehicle bodywork damage
- Varying degrees of roof damage
- Varying degrees of risk of injuries
- Varying degrees of aircraft damage
- Brick walls pitted
- Risk of severe or even fatal injuries to persons caught in the open

Data provided by NOAA lists the highest diameter of hail to be 4.5 inches, however community testimony indicates that the hailstorm of 2003 actually produced 6 inch diameter hail. (For the purposes of consistency with analysis data sources, NOAA/NWS datasets were used to determine extent and probability for all communities, while verbal community testimony was integrated into impact and vulnerability). The damage experienced during this storm made 6 inch holes in windshields and caused significant damage to the roof at the City shopping mall.

Hailstorms: Vulnerability Summary

Besides the large hail event of 2003, hailstorms are not a significant concern for the community. There is not a current plan in place for protection of critical vehicles and equipment. There is a variety of roof types for the public facilities in San Marcos, to include composition, built-up, and metal roofs. The City of San Marcos is the Hays County Seat and many critical facilities are located within the City. These have varying levels of vulnerability to hail.



Windstorms



Windstorms: Location

The entire extent of the City of San Marcos is exposed to some degree of wind hazard. Since wind can occur at any location, wind events could be experienced anywhere within the planning area.

Windstorms: Previous Occurrences

According to the NOAA Storm Events Database, there were 17 documented wind events listed for the City of San Marcos and 38 documented events listed for Hays County and its unincorporated jurisdictions from year 1974. While the NOAA Storm Events Database lists events since 1974 for the County, events were not documented per jurisdiction until 1994.

Windstorms: Extent and Probability

Wind is measured by the Beaufort Wind Scale that relates wind speed to observed conditions on land and sea. According to the reported previous windstorm occurrences in the planning area, the maximum wind extent experienced was 70 knots (corresponding to Beaufort Wind Scale Classification: Hurricane). Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of wind extent scales.

Based on 17 reported events in 22 years, the City of San Marcos can expect a wind event of up to 70 knots approximately once every year (on average) in the future (Beaufort Wind Scale Classification: Hurricane).

Windstorms: Impact

City level data available from the Texas Department of Transportation’s Crash Records Information System shows that between the years of 2010 and 2017, the City of San Marcos experienced 2 crashes related to severe crosswind weather conditions. There were no reported injuries from these crash events (see Table SM.4).

Table SM.4, Windstorms, Vehicle Accidents, City of San Marcos

City	Fatality	Incapacitating Injury	Non-Incapacitating Injury	Possible Injury	Crash Year	Street Name	Surface Condition	Weather Condition
San Marcos	0	0	0	0	2012	IH0035	Dry	Severe Crosswinds
San Marcos	0	0	0	0	2012	IH0035	Dry	Severe Crosswinds

(Texas Department of Transportation, 2017)

Structures can be damaged by flying debris and impact from winds, damaging rooftops and causing other structural damage. Manufactured homes are especially vulnerable to damage that high winds can cause, to include destruction in the most extreme event conditions.

Critical infrastructure, such as utility poles and street signals, could also be disrupted, impacting all residents in the affected area. Debris on the roadway can also cause obstruction for emergency responders’ ability to provide services.





Windstorms: Vulnerability Summary

Significant wind events in San Marcos have caused structural damage in the past. According to verbal community testimony (which is integrated into impact and vulnerability as NOAA and NWS reported datasets are utilized for occurrence and extent analysis), there was a previous windstorm in 2011 that caused damage to the Police Department and airport. In addition, it was stated that there were several roofs blown off of community apartment complexes. Additionally, the vulnerability of critical facilities within the community are a concern for the

continuity of services to the public.

An additional concern is the small number of manufactured home communities and mobile home parks. These structures are more vulnerable to severe winds than a site-built home. These types of residences make up less than 10% of the homes in San Marcos.

There are many sites of critical facilities and infrastructure and non-critical public facilities that are located within the City (according to spatial HAZUS data and community submitted critical facility data) that are not retrofitted to mitigate damages from extreme wind events. These facilities include: Hays County Dispatch, San Marcos Activity Center, Southside Community Center, San Marcos Fire Departments, San Marcos Police Department, Texas State University Police Department, Central Texas Medical Center, San Marcos City Hall, Hays County Health Department, and Hays County Government Center. Damages sustained by an extreme wind event to these facilities could hinder the ability to provide crucial services needed by the community.





Tornadoes

Tornadoes: Location

The entire extent of the City of San Marcos is exposed to some degree of tornado hazard. Since tornadoes can occur at any location, tornado events can be experienced anywhere within the planning area.

Tornadoes: Previous Occurrences

According to the NOAA Storm Events Database, there were 3 documented tornado events listed for the City of San Marcos and 16 documented events listed for Hays County since the year 1953. While NOAA Storm Events Database lists events since 1953 for the County, events were not documented per jurisdiction until 1997. The tornado events reported for the City of San Marcos are listed in Table SM.5.

Fatality, injury and damage amounts are shown in Table SM.5, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table SM.5, Tornado Events, City of San Marcos

Location	Date	Type	Extent	Fatalities	Injuries	Property Damage	Crop Damage
San Marcos	12/30/2002	Tornado	F0	0.00	0.00	0.00	0.00
San Marcos	1/13/2007	Tornado	F1	0.00	0.00	50000.00	0.00
San Marcos Lowman AR	10/30/2015	Tornado	EF1	0.00	0.00	0.00	0.00
Total				\$0.00	\$0.00	\$50,000.00	\$0.00

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)

Tornadoes: Extent and Probability

Tornadoes are measured by severity on the Fujita Scale and Enhanced Fujita Scales, with a range from 0-6. According to the reported previous tornado occurrences in the planning area, the maximum tornado extent experienced was a category EF1. Refer to Chapter 2, the risk assessment portion of the main plan document for a description of tornado extent scales, Fujita (F) Scale and Operational Enhanced Fujita (EF) Scale.

Based on 3 reported events in 19 years, the City of San Marcos can expect a tornado event approximately once every 6 years (on average) in the future, with up to an EF1 magnitude.

Tornadoes: Impact

Tornadoes in the City of San Marcos could impact roadways due to the large amount of vegetation and other objects that could become debris in the event of the high winds that accompany a funnel cloud. This debris could also cause physical harm to residents who may be outside during such an event. The wind speeds and debris caused by tornadoes can impact all residents in the community.

Based on San Marcos' past experience of tornadoes between F0 and EF1 levels, if similar events were to happen in the future in the City, the type of impacts that the planning area could expect associated with that magnitude would include:

- Light Damage - Broken branches; shallow rooted trees pushed over; some chimney damage.
 - Moderate Damage - Surface damage to roofs; mobile homes pushed off foundation; moving vehicles pushed off the road.
- (Tornado Facts, 2016)





Manufactured homes are especially vulnerable to damage that tornadoes can cause, to include destruction in higher magnitude events. Critical infrastructure, such as utility poles and street signals, could also be disrupted, impacting all residents in the affected area. Debris on the roadway can also cause obstruction for emergency responders' ability to provide services.

Tornadoes: Vulnerability Summary

There are 14 outdoor warning sirens throughout the City of San Marcos. These sirens, however, do not address residents with hearing or access needs. The City is exploring a variety of alternate notification methods to supplement the audible sirens. In addition, the City uses CodeRed to conduct their emergency notifications. Because registration is voluntary, there still remains a risk that people may not receive critical safety alerts and information because officials have no way to contact them without their information being added to the database. There is also a team of trained Storm Spotters that assist with detection of tornado events. This spotter team would benefit from an increase in membership.

An additional concern is the small number of manufactured home communities and mobile home parks. These structures are more vulnerable to tornado winds than a site-built home. These types of residences make up less than 10% of the homes in San Marcos.

Significant wind events in San Marcos have caused structural damage in the past. According to verbal community testimony (which is integrated into impact and vulnerability as NOAA and NWS reported datasets are utilized for occurrence and extent analysis), there was a previous windstorm in 2011 that caused damage to the Police Department and airport. This indicates vulnerability as severe winds accompany tornado events. In addition, it was stated that there were several roofs blown off of community apartment complexes.

There are many sites of critical facilities and infrastructure and non-critical public facilities that are located within the City (according to spatial HAZUS data and community submitted critical facility data) that are not retrofitted to mitigate damages from the extreme winds that accompany tornado events. These facilities include: Hays County Dispatch, San Marcos Activity Center, Southside Community Center, San Marcos Fire Departments, San Marcos Police Department, Texas State University Police Department, Central Texas Medical Center, San Marcos City Hall, Hays County Health Department, and Hays County Government Center. Damages sustained by a tornado event to these facilities could hinder the ability to provide crucial services needed by the community.





Expansive Soils

Expansive Soils: Location

According to the USGS Expansive Soils Regions, Figure 2.3 within Chapter 2 (the risk assessment portion of the main plan document), small sections of the western side of the City have less than 50% of the area underlain with soils with clayey textures that have high shrink-swell properties where as the rest of the planning area has over 50% of the area underlain with soils with abundant clays with high swelling potential, and is the area with the highest magnitude of expansive soil potential within the City.

Expansive Soils: Previous Occurrences

There was no documentation of past site-specific events for structural damage due to expansive soils from local, State, or national datasets found.

Expansive soils cannot be documented as a time-specific event, except when they lead to structural and infrastructure damage. There are no specific damage reports or historical records of events in the City, however future events can occur.

Expansive Soils: Extent and Probability

Considering the amount of swelling potential within the jurisdiction, and the lack of reported events, the probability of a future event is low (0 - 1 occurrences in the next 10 years affecting less than 5 structures).

Expansive Soils: Impact

Foundation issues for slab buildings and road base pads for mobile homes offer the most visible impacts to infrastructure and structures. Undocumented reports of small cracks to foundations and terrain could possibly be attributed to the presence of expansive soils. Deeper and longer cracks, and possible structural shifting could occur with natural conditions that increase soil swelling.

Expansive Soils: Vulnerability Summary

Areas within San Marcos that are experiencing higher amounts of development on previously undeveloped land may find a higher impact as this will offer increased opportunity for structural foundation damage in areas with high clay content. Expansion of jurisdictional boundaries and the development of more land between Austin, San Antonio and San Marcos can lead to exposure to previously unnoticed areas of expansive soil. The lack of current problems from this hazard in the community leads to a lessened concern for the issue. Should parts of the community with higher concentrations of clay in the soil begin to experience subdivision development, there may be a heightened amount of vulnerability for residential structures within San Marcos.







Floods: Previous Occurrences

According to the NOAA Storm Events Database, there were 8 documented flood events listed for the City of San Marcos and 69 documented events listed for Hays County from year 1997. While NOAA Storm Events Database lists events since 1997 for the County, events were not documented per jurisdiction until 2004. The flood events reported for the City of San Marcos are shown in Table SM.7.

Fatality, injury and damage amounts are shown in Table SM.7, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table SM.7, Flood Events, City of San Marcos

Location	Date	Type	Fatalities	Injuries	Property Damage	Crop Damage
San Marcos	11/14/2004	Flash Flood	1	0	0.00	0.00
San Marcos	9/8/2010	Flash Flood	0	0	0.00	0.00
San Marcos	5/13/2014	Flash Flood	0	0	0.00	0.00
San Marcos	5/27/2014	Flash Flood	0	0	0.00	0.00
San Marcos Lowman AR	5/30/2015	Flash Flood	0	0	5,000.00	0.00
San Marcos	6/28/2015	Flash Flood	0	0	0.00	0.00
San Marcos	5/19/2016	Flash Flood	0	0	0.00	0.00
San Marcos	9/26/2016	Flash Flood	0	0	0.00	0.00
Total			0	0	\$5,000.00	\$0.00

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)

Floods: Significant Past Events

Although not all documented in the NOAA storm events database specifically under the City of San Marcos, the significant flood events described for October 2013, May 2015, and October 2015 in the Significant Past Events within the Hays County Annex were events that greatly impacted the City of San Marcos. Refer to that section for details on those events.

Flood past events in San Marcos, Texas





Floods: Extent

Flood extent is described through a combination of ground elevation, river heights, 100-year Water Surface Elevations (WSE's) and HAZUS depth grids. Areas along the San Marcos River in the center of the community are exposed to some of the greatest flood extents. An example of flooding within the community is along the San Marcos River near Riviera Street and Riverside Drive. This area has an approximate overbank ground elevation of 572 feet with an intersecting 100-year WSE of 574 feet. For a 100-year event, water depth of approximately 2 feet can be expected within this area. A further analysis of the San Marcos River height is described below.

With the San Marcos River having an approximate in-channel elevation of 560 feet (per Light Detection and Ranging [LiDAR] and USGS gauge data), and an intersecting 100-year WSE of approximately of 574 feet, flood depths would be 14 feet.

Floods: Probability

Based on 8 reported events in 12 years, the City of San Marcos can expect a flood event approximately once every 1 to 2 years on average in the future, up to 14 feet in depth.

Floods: Impact

The following describes the inventory counts and building replacement values for the jurisdictional area.

San Marcos Building Counts			
Residential	Commercial	Other	Total
9,462	905	341	10,708

San Marcos Building Replacement Value		
Building (\$)	Content (\$)	Total (\$)
3,912,662,416	2,523,636,898	6,436,299,314



Flood past events in San Marcos, Texas





A Probabilistic 100-year Return Period HAZUS-MH 3.2 analysis was run on the City of San Marcos. HAZUS results are calculated to census blocks. These blocks were then intersected with the City to run a weighted area analysis for jurisdictional results. The following paragraphs describe results from the 100-year Return (1% Annual Chance Event) weighted area analysis.

HAZUS-MH Results

General Building Stock Damage

HAZUS estimates that about 1,102 buildings will be at least moderately damaged in San Marcos. “At least moderately damaged” is defined by HAZUS as greater than 10% damage to a building. The majority of damage can be expected to impact residential areas (98%). The remaining damages (2%) are expected for commercial, industrial, agriculture and religious buildings.

Residential Buildings	Commercial Buildings	Other Buildings	Total Buildings
1,080	19	3	1,102

Building-Related Losses

Exposed Value is the total building and content values for structures within the community. The exposed value for the community is \$6,436,299,314. The total building related losses were \$381,124,000 for this scenario. This represents 5.90% of the total replacement value of the community. Loss values are divided into building and content loss dollars.

Building Loss (\$)	Content Loss (\$)	Total Loss (\$)
176,961,000	204,163,000	381,124,000

Essential Facility Damage

HAZUS estimates 4 critical facilities and infrastructure to be out of service for 1 day each for this scenario. The scenario estimates that 100% of community hospital beds would be available for use by patients already in the hospital and those injured by an event. The estimated loss values for the area’s critical facilities and infrastructure are listed below.

Critical Facilities & Infrastructure (Count)	Building Loss (\$)	Content Loss (\$)	Total Loss (\$)
4	26,385	12,074	38,459

Debris Generation

HAZUS estimates the amount of debris that will be generated in this scenario at a total of 37,309 tons. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1,493 truckloads (with 1 to 25 tons per truck) to remove the building debris generated in this scenario.





Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS also estimates the number of people displaced that will require accommodations in temporary public shelters. The model estimates 7,503 people will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 6,858 people will seek temporary shelter in public shelters.

Floods: Vulnerability Summary

The City of San Marcos has the most Repetitive Loss payments in all of Hays County. This can obviously be attributed to the fact that the population is higher, but can also be related to proximity to the San Marcos River, the number of Pre-FIRM homes that were built before the Flood Damage Prevention Ordinance was adopted, and also the occurrences of localized flooding that occur outside of the Special Flood Hazard Area where elevation is not required.

According to community testimony, there are also a limited number of locations where mobility issues could create issues during flood events. There is a daycare at risk due to flooding and access to several group homes and other facilities where people are non-ambulatory and unable to seek higher ground on their own.

Areas with low water crossings that become overtopped are also an issue for emergency services access and the ability for residents to enter or exit their residences.

National Flood Insurance Program Repetitive Loss (RL)

The City of San Marcos is a current participant in the National Flood Insurance Program (NFIP) and has 247 tallied RL payments (as of September of 2016) with an average total (building & contents) payment of \$37,560.76.

Structure Type	Number of Structures	Amount of Claims
Residential	107	\$8,905,976.65
Non-Residential	3	\$371,530.54



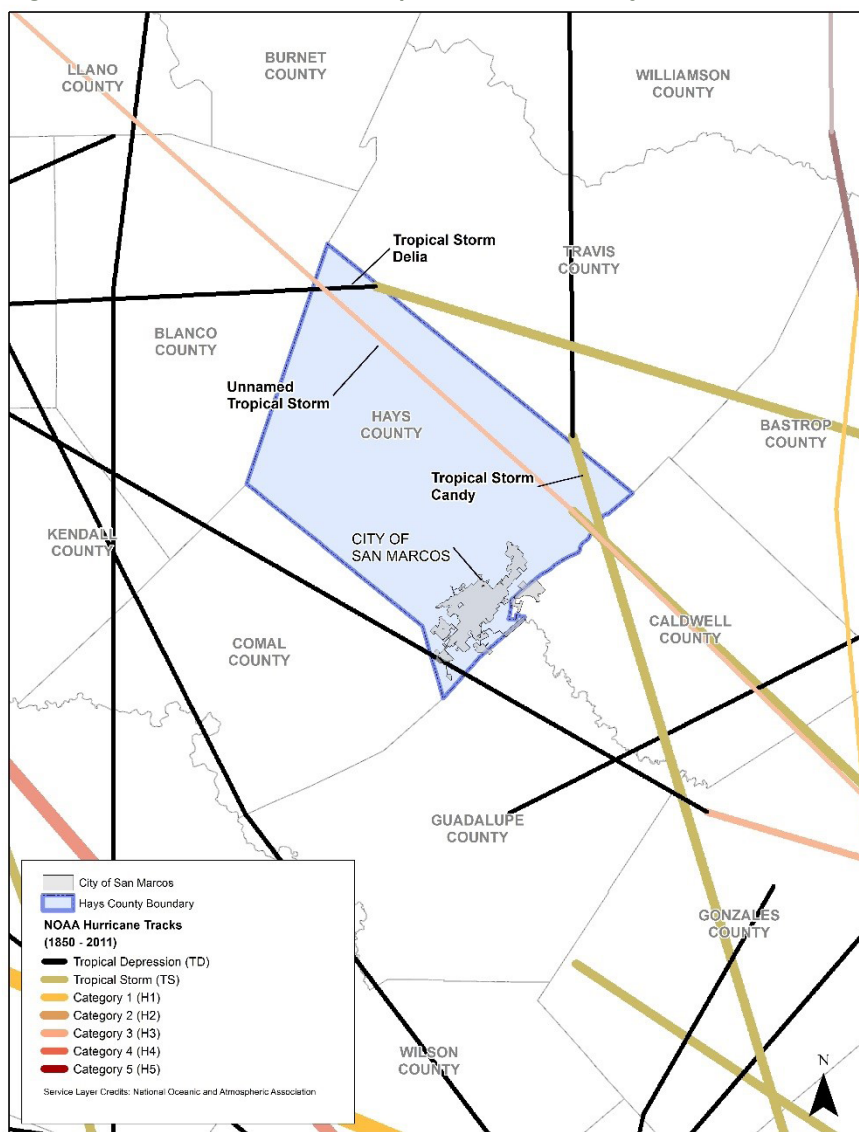


Hurricanes/Tropical Storms

Hurricanes/Tropical Storms: Location

Due to the regional nature of a hurricane or tropical storm event, the entire extent of the City of San Marcos is equally exposed to a hurricane or tropical storm. Figure SM.4 illustrates the location of the planning area with historical hurricane and tropical storm paths documented by NOAA's Hurricane Tracker from 1850 to 2011.

Figure SM.4, Historical Hurricane/Tropical Storm Paths, City of San Marcos



(National Oceanic and Atmospheric Administration, 2016)

Hurricanes/Tropical Storms: Previous Occurrences

The following events are listed based on NOAA Storm Events Database for Tropical Storm Hermine and NOAA Hurricane Tracker for all other events. By the time most hurricanes reach the County, they are tropical storms, depressions or thunderstorms. Because hurricane and tropical storm events occur on a regional scale, all events listed for Hays County have been included, as they would impact the City of San Marcos.





July 13 to July 22, 1909 – An unnamed storm made landfall near Freeport, as a Category 3 Hurricane. This storm impacted Hays County and participating communities as a tropical depression with wind speeds up to 30 knots. No significant damages, injuries, or fatalities were reported for the City.

June 22 to June 26, 1968 – Tropical Storm Candy made landfall near Port Aransas. This storm impacted Hays County and participating communities as a tropical storm with wind speeds slowing to 30 knots as a tropical depression just after leaving the County. No significant damages, injuries, or fatalities were reported for the planning area.

September 1 to September 7, 1973 – Tropical Storm Delia made landfall near the border of Brazoria and Matagorda Counties. This storm impacted Hays County and participating communities as a tropical storm with wind speeds slowing to 30 knots as a tropical depression just after leaving the County. No significant damages, injuries, or fatalities were reported for the jurisdiction.

September 6 to September 8, 2010 – According to the NOAA Storm Events Database, Tropical Storm Hermine made landfall near the Texas/Mexico border on the night of September 6. South Central Texas was hit very hard with widespread rains of 8 to 12 inches across much of the IH-35 corridor from Austin down to San Antonio.

Hurricanes/Tropical Storms: Extent and Probability

The Saffir-Simpson Scale measures pressure, wind speed, and storm surge in 5 categories. According to the reported previous hurricane occurrences in the jurisdiction, the maximum hurricane extent experienced was categorized as a tropical storm. Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of storm extents.

Based on 4 reported events in 107 years, a hurricane or tropical storm event occurs approximately every 27 years on average in Hays County. Since hurricane and tropical storm events can happen anywhere throughout the HMP update area, the City of San Marcos' future probability is assumed to be similar to the surrounding County areas. In the future, the City can expect an event approximately once every 27 years on average, of up to a magnitude of a tropical storm at a 100-yr Max Wind Speed of 78 mph based on historical extents and HAZUS analysis.

Hurricanes/Tropical Storms: Impact

A Probabilistic 100-year Return Period HAZUS-MH 3.2 analysis was run for the City of San Marcos. The following describes the results of this analysis.

HAZUS-MH Results

General Building Stock Damage

The total property damage losses were \$2,251,079. The majority of damage can be expected to impact residential areas (98%). The remaining damages (2%) are for commercial, industrial, agricultural and religious buildings. While some building damage is experienced, it is estimated that no buildings will be completely destroyed or experience severe damage. Exposed Value is the total building and content values for structures within the community. Loss values are divided separately for building and content loss in dollars.

Exposed Value (\$) (Building + Content)	Building Loss (\$)	Content Loss (\$)	Total Loss (\$)
6,436,299,314	2,251,079	30,222	2,281,301





Essential Facility Damage

HAZUS does not estimate any critical facilities or infrastructure to be interrupted for more than 1 day on the day of the event. The model estimates that 100% of hospital beds would be available for use by patients already in the hospital and for those injured by the hurricane.

Debris Generation

HAZUS estimates the amount of debris that will be generated by the hurricane.

The model estimates that a total of 350 tons of debris will be generated. Of the total amount, brick/wood comprises 100% of the total. If the building debris tonnage is converted to an estimated number of truckloads, it will require 14 truckloads (with 1 to 25 tons per truck) to remove the building debris generated by the hurricane.

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of people displaced that will require accommodations in temporary public shelters. The model estimates no households to be displaced due to the hurricane. While there is an estimation of over \$2.2 million in property damages expected, it is aforementioned that “no buildings would be completely destroyed or experience severe damage.” Residents would likely remain in their homes as damages were repaired, therefore no temporary shelter is needed.

Hurricanes/Tropical Storms: Vulnerability Summary

Similar to the impacts of windstorms, hailstorms, and lightning, San Marcos can expect to be impacted with debris and possible interruptions of critical infrastructure if the event is a stronger magnitude than those previously experienced by the City. In addition, the community’s proximity to IH-35 could lead to traffic delays caused by major evacuation efforts if the highway is used as an evacuation route for coastal residents.

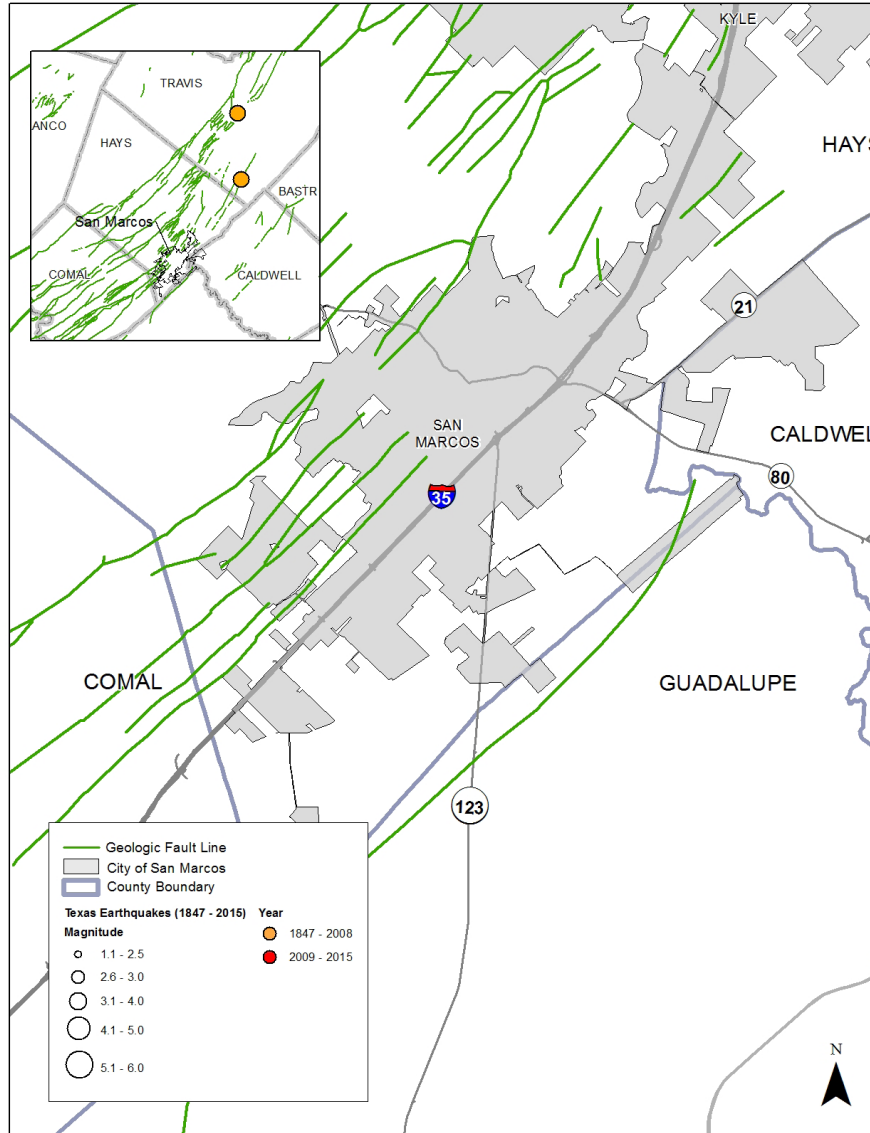


Earthquakes

Earthquakes: Location

Locations within proximity to fault lines are typically the areas most at risk for earthquakes. Figure SM.5 shows USGS documented fault lines and the locations of earthquakes from 1847 to 2015 in relation to the City of San Marcos.

Figure SM.5, Texas Earthquakes, 1847 – 2015, City of San Marcos



(USGS Earthquake Hazard Program, 2015)



Earthquakes: Previous Occurrences

According to USGS 1847-2015 data, there have been no documented earthquake events for the City of San Marcos, as illustrated in Figure SM.5.

Earthquakes: Extent and Probability

Earthquakes are measured by Peak Ground Acceleration (PGA). The HAZUS Max PGA for the planning area is 1.56% (see Earthquakes: Impact Section for a description of the HAZUS Analysis). This corresponds to the Modified Mercalli Scale Category IV, with light perceived shaking and no potential structure damage.



HAZUS measures PGA on a census tract level. Cities within more than 1 census tract were assigned the highest PGA level to reflect the maximum possible extent. Refer to Chapter 2 for extent scale descriptions (the risk assessment portion of the main plan document).

As there have been no recorded previous occurrences of earthquakes for the City of San Marcos and the PGA is less than 2% for the area, the probability of an earthquake in the City in the future is low (0 - 1 occurrences in the next 10 years, at up to a 500yr PGA of 1.56%).

Earthquakes: Impact

The FEMA How-To Guidance, Understanding Your Risks (FEMA 386-2, page 1-7), suggests the earthquake hazard should be profiled if the PGA is greater than 3%g, where PGA is measured in the acceleration of gravity (g). The City's PGA is less than 3%g (0.03) and there have been no recorded earthquakes in or near the jurisdiction. Therefore, only a minimum level-1 HAZUS analysis was profiled using the 500-year probability event scenario. The HAZUS analysis produced a PGA of 1.56%. HAZUS scenario would produce \$0 in building damages (Residential, Commercial, Agriculture, Religious and Government) from an event. Critical facilities and infrastructure would not experience any loss of service. There would be no critical facilities or infrastructure that would experience moderate to complete damage. No debris would be generated from this event and no people or households would require temporary housing. There would be no moderate, extensive or completely damaged buildings by this event. HAZUS estimates no residents are expected to be displaced from their homes or will require accommodations in temporary public shelters due to the simulated earthquake. Additionally, there would be no casualties or fatalities from this event.

Earthquakes: Vulnerability Summary

While the probability of an earthquake in San Marcos is low, with no significant prior events on file, there are fault lines within the community that could cause impact if there were to be an increase in seismic activity in the area. There are 13 fault lines located within the jurisdiction according to USGS data. San Marcos could expect to be impacted with debris and possible interruptions if an event were to occur in this unlikely and unprecedented scenario. If an event were to incapacitate a roadway, emergency responders would be hindered from responding, thus leaving the residents who were affected at risk.

The following thoroughfares are crossed by the USGS fault lines displayed on Figure SM.5:

LBJ, RM 12, Craddock Avenue, Nevada Street, S. Stagecoach Trail, W. Sierra Circle, Camaro Way, and Lancaster Street.

Additionally, the following critical facilities and infrastructure and non-critical public facilities (according to HAZUS and community submitted critical facility data) are located within 1 mile of a fault line within the community:

Hays County Public Safety Answering Point (PSAP), Grande Communications, South Hays Fire Department, San Marcos Police Department (SMPD), Hays County Sheriff, 3 San Marcos Fire Department Locations, Primary EOC – SMPD, SMHCEMS Medics 5, 13, 11, and 12, San Marcos Treatment Center, Goodnight Middle School, Crockett Elementary, Hernandez Elementary, Miller Middle School, Travis Elementary, Blanco Vista Elementary, Mendez Elementary, San Marcos Adventist Junior Academy, San Marcos Center School, Public Safety Building/Jail, Hays County Government Center, and 2 Armed Forces Reserve Centers.





Page 25, 26, and 27 Dam/Levee Failure have been redacted from this copy of the plan.

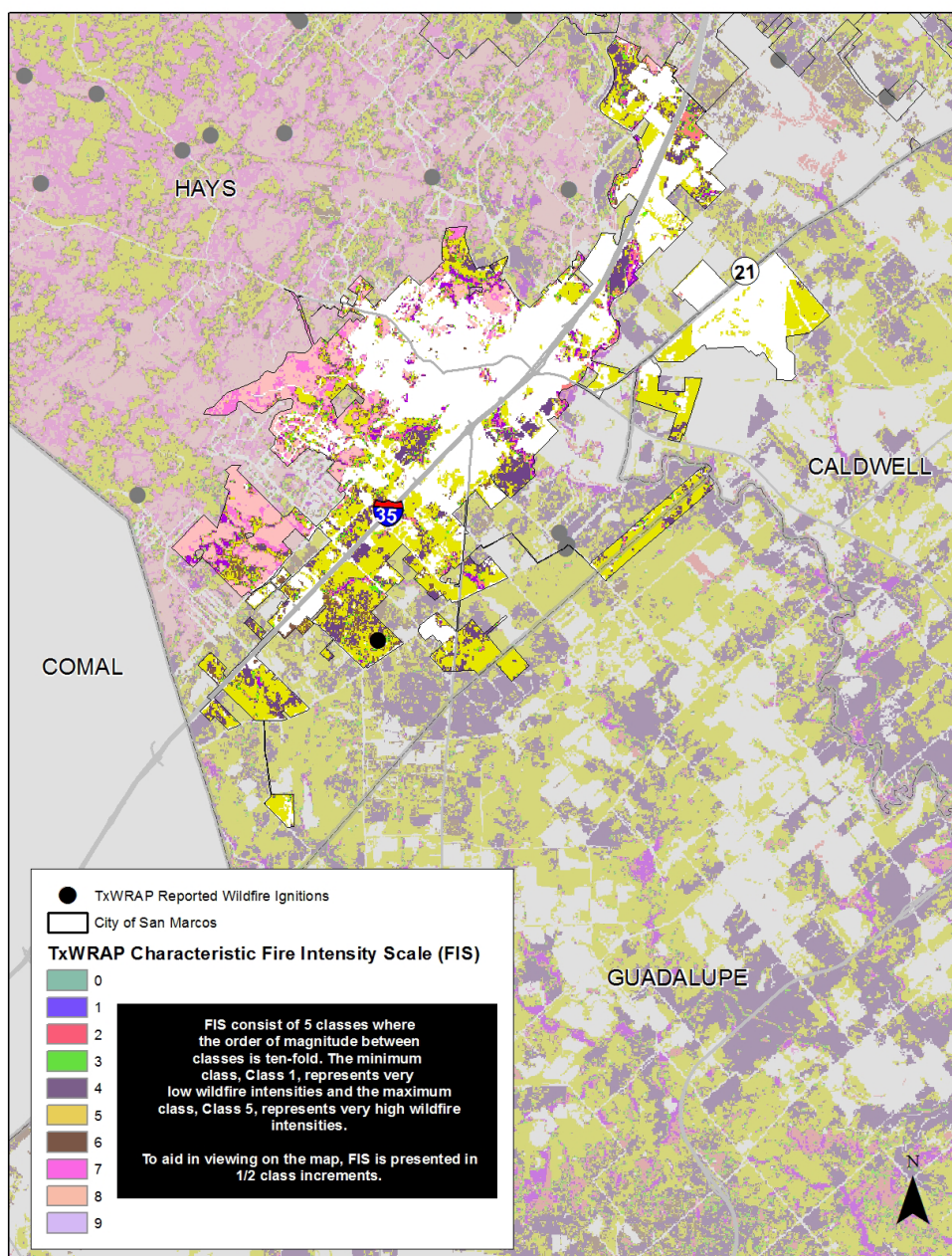


Wildfires

Wildfires: Location

Wildfires can be ignited from a variety of sources including lightning or human activity such as campfires, smoking, arson, or equipment use. The Texas A&M Forest Service's Texas Wildfire Risk Assessment Portal (TxWRAP) can be used to help communities understand their wildfire risk. Figure SM.7 below shows the location of TxWRAP's documented wildfire occurrences with Fire Intensity Scale (FIS) classifications within the City of San Marcos. TxWRAP identifies FIS areas as those where wildfire fuels and associated potential dangerous fire behavior exist, based on a weighted average of 4 percentile weather categories.

Figure SM.7, Fire Intensity Scale (FIS) and Reported Wildfire Ignitions, City of San Marcos



(Texas A&M Forest Service, 2016)



Wildfires: Previous Occurrences

Table SM.9 shows the reported wildfire ignition within the City of San Marcos, according to TxWRAP and USGS Federal Fire Occurrence data from the years 1980 to 2015.

Table SM.9, Wildfire Ignitions, City of San Marcos

FPA ID	Date	Fire Size (Acres)
SFO-TX0483-72797	1/1/2008	67

Wildfires: Extent and Probability

Table SM.10 lists the Fire Intensity Acreage for the City, according to the Texas A&M Forest Service TxWRAP Community Summary Report. Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of the FIS.

Table SM.10, TxWRAP Fire Intensity Acreage, City of San Marcos

Class	Acres	Percent
Non-Burnable	10,065	49.20%
1 (Very Low)	547	2.70%
1.5	844	4.10%
2 (Low)	216	1.10%
2.5	1,538	7.50%
3 (Moderate)	4,573	22.30%
3.5	525	2.60%
4 (High)	527	2.60%
4.5	1,631	8.00%
5 (Very High)	0	0.00%
Total	20,467	100.00%

Based on 1 reported event in 35 years, the City of San Marcos' future probability of a wildfire event is approximately once every 35 years (on average), with up to a potential fire intensity of 4.5, or "High" classification on the TxWRAP FIS.

Wildfires: Impact

Impact on the community can be measured using TxWRAP housing density levels within the WUI. Areas with a higher housing and population density would be affected to a greater extent than rural areas, especially in areas near burnable fuels. In the event of a wildfire in high density areas of population, residential structures would be damaged or destroyed, critical infrastructure such as water, sewer and electrical services would interrupted and residents would experience injury or loss of life. Table SM.11 lists the population, percent of total population, WUI acreage and percent of WUI acreage for the City of San Marcos, according to the Texas A&M Forest Service TxWRAP Community Summary Report.



Table SM.11, WUI Acreage, City of San Marcos

Housing Density	WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
LT 1hs/40ac	30	0.10%	1,620	16.40%
1hs/40ac to 1hs/20ac	35	0.10%	698	7.10%
1hs/20ac to 1hs/10ac	84	0.30%	909	9.20%
1hs/10ac to 1hs/5ac	302	1.00%	984	9.90%
1hs/5ac to 1hs/2ac	755	2.50%	1,413	14.30%
1hs/2ac to 3hs/1ac	11,502	38.80%	3,164	32.00%
GT 3hs/1ac	16,929	57.10%	1,103	11.20%
Total	29,637	100.00%	9,891	100.00%



Wildfires: Vulnerability Summary

Due to the urban nature of San Marcos, community officials are not overly concerned for the WUI within the City Limits, as there are not significant numbers of structures at risk in the areas. There are not currently fire breaks in place, however this could be a potential action for the community to take in the future to lessen risk.

Although there is an ongoing program for picking up brush in the community, there may be a way to market the event in a way so that more citizens are made aware of the effort. This could decrease the amount of vegetative fuel in the community and also serve as an opportunity for an outreach campaign regarding wildfire mitigation.



2.2 Risk Ranking Result

On January 12, 2017, members of the City of San Marcos MPC completed a questionnaire as part of the Hays County Hazard Mitigation Plan Update: Risk Assessment. The questions covered the risk associated with the hazards that affect each community based on the level of concern over each profiled hazard, the hazards' impact on health and safety, as well as impact to property and business continuity. The answers from this questionnaire were combined with public survey results on perception of risk, and the values from both sources were analyzed using the Halff Risk Ranking Tool (details regarding the risk ranking tool are in Chapter 2, the risk assessment portion of the main plan document). The results provided a quantified ranking of risk, with values ranging from 0 to 100. The results for San Marcos are shown below (hazard values shown from highest risk to lowest):

Ranking Order	Hazard	Risk Ranking Value
1	Floods	99.5
2	Drought	94.1
3	Dam/Levee Failure	91.3
4	Severe Winter Storms	72.9
5	Tornadoes	70.9
6	Extreme Heat	70.0
7	Wildfire	51.9
8	Wind Storms	51.0
9	Lightning	50.8
10	Hail Storms	44.7
11	Expansive Soils	43.2
12	Earthquakes	35.9
13	Hurricanes/Tropical Storms	33.8
-	Land Subsidence	Not Profiled



Section 3: Mitigation Strategy

This section examines the community's ability to perform mitigation (a review of existing capabilities is shown in Table SM.12) and identifies specific mitigation actions to address vulnerabilities for each hazard profiled in the Hays County HMP Update. The mitigation strategy is the application of actions into an approach for performing structural and non-structural mitigation efforts within the jurisdiction. Actions are also prioritized and considered for incorporation into other community programs, regulations, projects or plans.

Completed and canceled actions are also included in a separate section for future reference.

3.1 Existing Capabilities

Table SM.12, Existing Capabilities

Capability Name	Capability Type	Ability to Expand/Improve
Mayor	Elected Official	Provides political support for approving and funding mitigation actions. Could attend mitigation information session given by MPC to learn about community risks and mitigation strategy.
Council Members		Supplements political support for implementation of mitigation actions. Could attend mitigation information session given by MPC to learn about community risks and mitigation strategy.
Emergency Management Coordinator	City Staff	Coordinates MPC, implementation of mitigation actions, and monitoring/evaluation/updating HMP. Join other community planning committee, in role as EMC and MPC planner.
Floodplain Administrator (Sr. Engineer)		Ensures enforcement of existing flood damage prevention ordinance, and continued compliance with NFIP requirements. Attend advanced floodplain management training.
Civil Engineer		Provides expertise and guidance for structural mitigation actions. Attend advanced floodplain management training.
Chief Building Official		Collaborates with MPC on ensuring compliance with existing mitigation-related building requirements and consideration of new building practices to increase mitigation. Attend advanced floodplain management training.
Planning and Zoning		Considers HMP-identified risk areas when consulting with community planning stakeholders. Include member of MPC in committee for mitigation consideration.
GIS Coordinator		Can graphically demonstrate changes in development and changes in hazard areas. Track damage data geographically for future risk analysis purposes.
Parks and Recreation Director		Assists in identifying opportunities for integration of mitigation activities into long-term park development plans. Can also assist with coordinating public outreach events.
Police Chief		Assists with flood-related traffic control and evacuation planning. Participate in MPC.
Fire Chief		Assists with wildfire-related mitigation through existing programs and efforts as well as implementation of new measures. Participate in MPC.

Table SM.12, Existing Capabilities, (cont.)

Capability Name	Capability Type	Ability to Expand/Improve
Sales Tax	Funding	Provides potential funding for Hazard Mitigation items
Property Tax		
Franchise Tax		
Permitting and Licensing Fees		
Capital Improvement Plan Funding	Funding	Budget dollars obligated to projects that involve multiple mitigation-related actions.
Chapter 211 of the Local Government Code: Zoning	Authority	State-level code that authorizes the City to regulate zoning.
Chapter 213 of the Local Government Code: Municipal Comprehensive Plans		State-level code that authorizes the City to adopt a comprehensive plan for the long-range development of the City.
Chapter 214 of the Local Government Code		State-level code that authorizes the City to have regulatory authority as it relates to building code (such as structural integrity and plumbing).
General Ordinances Chapter 39- Flood Damage Prevention- methods for reducing flood losses	Regulation	Power to regulate over development in the floodplain. (Municode, 2017) Adopt higher standards in order to qualify for increased Community Rating System rating.
General Ordinances Chapter 86/Article 8- Drainage Utility Fee		Authorizes charging fees that can be utilized for mitigation activities. (Municode, 2017)
Land Development Code Chapter 4- Zoning Regulations		Provides authority over zoning activities, enhance if used with risk assessment information to discourage development in high hazard areas. (Municode, 2017)
Land Development Code Chapter 7- Public Facilities Standards		Ability to increase standards to ensure resiliency of public facilities through mitigation practices. (Municode, 2017)
Land Development Code Chapter 3- Comprehensive Planning		Allows for the community to plan for the future and control growth and development of the community within the vision of the planners. (Municode, 2017).
Land Development Code Chapter 1- Development Procedures		Control over the way land is developed within the City. (Municode, 2017) Enhance through safe growth practices.
Land Development Code Chapter 5- Environmental Regulations		Oversight on the standards that are withheld to protect natural resources. (Municode, 2017) Enhance to protect riverine areas.
General Ordinances Chapter 26- Civil Emergencies		Sets standards for the roles, responsibilities and authority granted to the City during emergencies, to include ordering evacuations and communicating disaster messaging. (Municode, 2017). Enhance natural hazard data.
General Ordinances Chapter 14- Buildings and Building Regulations		Regulation of building standards for construction. (Municode, 2017) Adopt higher standards for mitigation.
General Ordinances Chapter 38- Fire Prevention and Protection		Allows community to disallow dangerous activities and encourage/require fire prevention practices. (Municode, 2017)



3.2 National Flood Insurance Program Participation

The City of San Marcos participates in the National Flood Insurance Program. The community administers their own program and their floodplain administrator is a Senior Engineer. The community has adopted higher standards in their Flood Damage Prevention Ordinance and participates in the Community Rating System. The City will continue to explore options for higher standards and increasing their rating within CRS. The community has 780 NFIP policies in force, as of January 31, 2017, which provides \$167,307,000 total insurance coverage in force.

3.3 Mitigation Goals

The plan-level Mitigation Goals can be found in Chapter 3: The Mitigation Strategy portion of the Hays County Hazard Mitigation Plan. These apply to each community and were mutually decided upon as the guiding goals for the development of actions in each planning area.



3.4 Mitigation Actions

*E= Actions reducing risk to existing buildings and infrastructure

*F= Actions reducing risk to new development and redevelopment

Number/Title	Hazard	Item Description	Implementation Agency	
1 Promote Flood Insurance in the Community (previously action 1 in 2011 plan, modified)	Floods	Placing National Flood Insurance Program information brochures in City Hall.	City of San Marcos Emergency Management, Floodplain Administration	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services, free brochures from FEMA		1 month	In progress	N/A
Cost and Benefit Considerations				
The cost and labor required to promote the NFIP is negligible. The benefit is difficult to estimate.				

Number/Title	Hazard	Item Description	Implementation Agency	
2 Acquisition or Elevation of Repetitive Loss Properties (previously action 3 in 2011 plan, modified)	Floods	As of 09/2016, San Marcos has 110 RL properties that need mitigation to reduce the over \$9.1 million in payments that have been made.	City of San Marcos City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
The estimated acquisition cost is \$100,000 per structure (\$11 million total for 110 structures). The estimated cost to elevate a residential structure a total of 3 feet in a shallow flooding area is \$30,000 per structure (\$3.3 million total for 110 structures). Funding Sources: FEMA, TDEM, TWDB, GLO, Hays County		48 months	Delayed	E
Cost and Benefit Considerations				
Cost effectiveness for these acquisitions or elevations are determined on a per structure or project basis.				

Number/Title	Hazard	Item Description	Implementation Agency	
3 Increase of Warning Signs and Barricades at Low Water Crossings (previously action 2 in 2011 plan, modified)	Floods	Increase number of barricades for low water crossings, as Phase 2 of the Action Item that was previously completed.	City of San Marcos City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$20,000 - Funding for cost share: in-kind services		18 months	Ongoing	N/A
Cost and Benefit Considerations				
This item would only take the amount of time/labor required to amend an ordinance within the City. The benefit would be for substantially improved or new development.				



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Number/Title	Hazard	Item Description	Implementation Agency	
4 Attend Advanced Local Floodplain Management Courses (previously action 6 in 2011 plan, modified)	Floods	Send certified member of staff to advanced courses.	City of San Marcos Floodplain Management	
Cost Estimate/Funding		Schedule	Status as of 2017	Risk Focus:
Existing staff, cost of accommodations for FEMA training off-site		6 months	Delayed	E/F
Cost and Benefit Considerations				
If attending the course at the Emergency Management Institute, the cost of the course would be very low, and only include a minimal meal ticket purchase. The benefit of an informed floodplain administrator would help both new and existing residents through guidance on how to mitigate flood damages to development.				

Number/Title	Hazard	Item Description	Implementation Agency	
5 Improve Flood Warning Systems (previously action 5 in 2011 plan)	Floods	Enhancing stream flow gage network by increasing number of gages throughout community by at least six.	City of San Marcos Emergency Management	
Cost Estimate/Funding		Schedule	Status as of 2017	Risk Focus:
\$120,000- Funding for cost share: in-kind services		Phased over 60 months	Not started	N/A
Cost and Benefit Considerations				
This action promotes public safety services through enhancing the communities existing method of detecting flooding.				

Number/Title	Hazard	Item Description	Implementation Agency	
6 Storm Ready Designation from National Weather Service (previously action 11 in 2011 plan)	Severe Winter Weather, Lightning, Hailstorm, Windstorm, Tornadoes, Floods, Hurricanes/ Tropical Storms	Application for designation that classifies community's level of preparedness for severe weather and storms.	City of San Marcos Emergency Management	
Cost Estimate/Funding		Schedule	Status as of 2017	Risk Focus:
Existing staff/ in-kind services		6 months	Not Started	N/A
Cost and Benefit Considerations				
There is a high level of effort to complete the application, however no other cost applies. The level of increased preparedness would benefit the entire population.				

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Number/Title	Hazard	Item Description	Implementation Agency	
7 Increase Public Awareness of Hazard Mitigation (previously action 19 in 2011 plan, modified)	Drought, Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Expansive Soils, Floods, Hurricanes/Tropical Storms, Earthquakes, Dam/Levee Failure, Wildfires	Public awareness campaign of providing natural hazard mitigation information and guidance for citizens on the City website, with links to HaysInformed.com also being included.	City of San Marcos Emergency Management	
Cost Estimate/Funding		Schedule	Status as of 2017	Risk Focus:
Existing staff/ in-kind services		1 month	Not started	N/A
Cost and Benefit Considerations				
There is minimal cost and labor required to make this enhancement to the existing San Marcos City website.				
Number/Title	Hazard	Item Description	Implementation Agency	
8 Adopt Wildfire Maps from Hays County Firewise project (previously action 20 in 2011 plan, modified)	Wildfires	Formally adopt the maps created through the Hays County application for Firewise designation in order to begin to control development in accordance with the avoidance of hazard areas, or development with consideration of proper mitigation.	City of San Marcos Fire Marshal's Office, in coordination with Hays County Fire Marshal's office	
Cost Estimate/Funding		Schedule	Status as of 2017	Risk Focus:
Existing staff/ in-kind services		6 months	Not started	E/F
Cost and Benefit Considerations				
The benefit of mitigating against wildfire for future development as well as for instituting fire mitigation in existing areas of development greatly saves the community from the costs of potential damages.				
Number/Title	Hazard	Item Description	Implementation Agency	
9 Coordination of marketing Large Item Pick-up day for Wildfire Mitigation (previously action 33 in 2011 plan, modified)	Wildfire, Lightning, Windstorms, Tornadoes	Enhancement of existing large item pick-up to emphasize the wildfire mitigation benefits of cleaning brush and overgrown lots.	City of San Marcos Public Works	
Cost Estimate/Funding		Schedule	Status as of 2017	Risk Focus:
Existing staff/ in-kind services		2 months	Ongoing	N/A
Cost and Benefit Considerations				
This slight change to marketing an existing event would likely lessen the risk for wildland fire for residents located within the Wildland Urban Interface.				



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Number/Title	Hazard	Item Description	Implementation Agency	
10 Drought Monitoring Program	Drought	Provide widget on City homepage that provides the latest US Drought Monitor conditions for the day.	City of San Marcos Emergency Management Coordinator	
Cost Estimate/Funding		Schedule	Status as of 2017	Risk Focus:
Existing staff/ in-kind services		6 months	Not started	N/A
Cost and Benefit Considerations				
This low cost monitoring and inclusion of drought water conservation measures will take more time than money to institute and could save the community from a water shortage. All residents that use the water source would benefit.				

Number/Title	Hazard	Item Description	Implementation Agency	
11 Evacuation Plans/ Alternate road consideration (previously item 27 in 2011 plan)	Hurricanes/ Tropical Storms, Floods, Dam/ Levee Failure, Wildfire	Documentation of an evacuation plan that includes multiple exits for leaving the community.	City of San Marcos Emergency Management	
Cost Estimate/Funding		Schedule	Status as of 2017	Risk Focus:
Existing staff/ in-kind services		18 months	In progress	F
Cost and Benefit Considerations				
It is more cost effective to establish additional evacuation routes than other mitigation alternatives.				

Number/Title	Hazard	Item Description	Implementation Agency	
12 Soil Compaction Recommendation/ Road construction using techniques to Mitigate Expansive Soils	Expansive Soils	Adoption of road techniques that require a higher level of soil compaction to mitigate expansive soils. Recommendation documents for soil compaction to lessen the possible effects of expansive soils for residential foundations.	City of San Marcos City Hall	
Cost Estimate/Funding		Schedule	Status as of 2017	Risk Focus:
Existing staff/ in-kind services, cost of engineer support		6 months	Not Started	F
Cost and Benefit Considerations				
This recommendation would add a level of protection to future development of foundations so that they mitigate against expansive soil damage.				

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Number/Title	Hazard	Item Description	Implementation Agency	
13 Sanding Capability Enhancements (previously action 22 in 2011 plan)	Severe Winter Weather	Research of methods and equipment that could be a benefit cost efficient method to increase sanding capability.	City of San Marcos Public Works	
Cost Estimate/Funding		Schedule	Status as of 2017	Risk Focus:
Existing staff/ in-kind services		12 months	Not Started	N/A
Cost and Benefit Considerations				
The community already has resources for spreading sand but recognizes that the extent of sanding is limited by the current equipment. The cost alternatives would have to be weighed against the recent years' events and the number of ice days that were experienced during which City roads were impassable.				
Number/Title	Hazard	Item Description	Implementation Agency	
14 Adoption of Ordinance for Public Land Use Risk Assessment Reviews (previously action 24 in 2011 plan, modified)	Floods, Earthquakes, Wildfires, Expansive Soils, Dam/ Levee Failure	Ordinance update to require any public facility location be reviewed against hazard area layers in order to require location selections consider the safest possible locations, with applicable mitigation standards required during development permitting for increased resilience against relevant hazards.	City of San Marcos Planning in coordination with Emergency Management Coordinator	
Cost Estimate/Funding		Schedule	Status as of 2017	Risk Focus:
Existing staff/ in-kind services		6 months	Not started	F
Cost and Benefit Considerations				
This enhancement to existing permitting and review processes is an action that would save the community from potential losses related to hazards that affect critical facilities and infrastructure that all citizens depend upon for services.				
Number/Title	Hazard	Item Description	Implementation Agency	
15 Adoption of Ordinance for Public Building Structural Engineering Reviews	Tornadoes, Windstorms, Floods, Hurricanes/ Tropical Storms, Wildfires, Earthquakes, Hailstorms, Severe Winter Storms, and Lightning	Ordinance update to require any public facility building plan be structurally reviewed and enforce highest possible building code levels that increase resiliency against natural hazards.	City of San Marcos Planning	
Cost Estimate/Funding		Schedule	Status as of 2017	Risk Focus:
Existing staff/ in-kind services		6 months	Not started	F
Cost and Benefit Considerations				
This enhancement to existing permitting and review processes is an action that would save the community from potential losses related to hazards that affect critical facilities and infrastructure that all citizens depend upon for services.				



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Number/Title	Hazard	Item Description	Implementation Agency	
16 Dam Safety Tabletop Exercises Program (previously action 26 in 2011 plan, modified)	Dam/Levee Failure	Coordination with dam custodians in order to exercise evacuation and emergency procedures/ Make inundation maps public.	City of San Marcos Emergency Management	
Cost Estimate/Funding		Schedule	Status as of 2017	Risk Focus:
Staff resources/ in-kind services, San Marcos and USACE		12 months	Not started	N/A
Cost and Benefit Considerations				
The majority of the labor and cost for this effort would be covered by the owner of the dam. The benefit would be an increased familiarity with the evacuation procedures and expectations that will result in safer conditions for citizens and visitors.				

Number/Title	Hazard	Item Description	Implementation Agency	
17 Sessom Creek Improvements	Floods	Existing CIP project that would improve drainage off Sessom Creek.	City of San Marcos Engineering	
Cost Estimate/Funding		Schedule	Status as of 2017	Risk Focus:
\$300,000 CIP Budget		18 months	Not started	E
Cost and Benefit Considerations				
This project potentially already has funding due to its presence in the Capital Improvements Plan.				

Number/Title	Hazard	Item Description	Implementation Agency	
18 Adoption of homelessness study results as part of vulnerable population consideration activities in City for future Hazard Mitigation Plan action creation.	Drought, Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Floods, Hurricanes/Tropical Storms, Earthquakes, Dam/Levee Failure, Wildfires	Adoption of homelessness study proposed in San Marcos Comprehensive Plan, in order to plan for mitigation measures that serve this vulnerable population.	City of San Marcos Mitigation Planning Committee	
Cost Estimate/Funding		Schedule	Status as of 2017	Risk Focus:
Existing staff/ in-kind services		6 months	Not started	N/A
Cost and Benefit Considerations				
This existing effort is planned for and adopted as an action for the community. The adoption of the resulting report will not cost any funds. The benefits will be serving the vulnerable homeless population.				

Hays County Hazard Mitigation Plan, City of San Marcos Annex

Number/Title	Hazard	Item Description	Implementation Agency	
19 Extension of River Ridge Parkway West	Floods	Action R11 of the San Marcos Transportation Plan, this action will increase the ability to divert traffic during flooding events.	City of San Marcos Engineering	
Cost Estimate/Funding		Schedule	Status as of 2017	Risk Focus:
\$2,743,000 Transportation Budget		18 months	Not started	E
Cost and Benefit Considerations				
This is a project from an existing community plan that likely already has dedicated funding for completion.				

Number/Title	Hazard	Item Description	Implementation Agency	
20 Land Conservation for Aquifer Recharge	Drought, Flooding	The preservation of land in flood-prone areas and in the 1% floodplain will help mitigate flooding by reducing the amount of impervious surfaces and allowing more recharge and infiltration of water during rain events.	City of San Marcos Engineering, Floodplain Administrator and Parks Department	
Cost Estimate/Funding		Schedule	Status as of 2017	Risk Focus:
Dependent upon costs per acre as land is acquired Funding sources: Local, State, Federal, Non-government and other sources		18 months	Ongoing	F
Cost and Benefit Considerations				
This effort would integrate benefits to not only San Marcos, but to other parts of the County and areas that are served by the aquifer. The benefits would be significant and the natural conservation effort would receive consideration during benefit cost analysis.				

Number/Title	Hazard	Item Description	Implementation Agency	
21 Regional Detention/ Water Quality Strategy	Floods, Drought	Strategy design to mitigate drought and flooding by use of regional detention.	City of San Marcos Engineering	
Cost Estimate/Funding		Schedule	Status as of 2017	Risk Focus:
\$200,000 Stormwater budget		18 months	Not started	F
Cost and Benefit Considerations				
Existing plan item for comprehensive plan, this project is likely to receive City funding.				



Hays County Hazard Mitigation Plan, City of San Marcos Annex

Number/Title	Hazard	Item Description	Implementation Agency	
23 Cooling Plan Development and Implementation	Extreme Heat	Evaluate the risks presented by excessive heat and humidity, especially in terms of high-risk populations such as the elderly or low income. Pursue possibility of local churches serving as cooling stations during extreme heat events.	City of San Marcos Emergency Management	
Cost Estimate/Funding		Schedule	Status as of 2017	Risk Focus:
No additional cost – uses existing staff resources / In-kind Services		12 months	Not started	N/A
Cost and Benefit Considerations				
Cost-effective and beneficial in minimizing injuries during extreme heat events.				


Number/Title	Hazard	Item Description	Implementation Agency	
24 Purchase and Installation of Generators for Temporary Sheltering Efforts	Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Floods, Hurricanes/Tropical Storms, Earthquakes, Dam/Levee Failure, Wildfires	Purchase and installation of generators for temporary sheltering efforts in all public facilities capable of housing citizens.	City of San Marcos Emergency Management	
Cost Estimate/Funding		Schedule	Status as of 2017	Risk Focus:
Existing staff/ in-kind services, grant writing assistance, Hazard Mitigation Grant program funding, if applicable and eligible		18 months	Not started	N/A
Cost and Benefit Considerations				
If grant funding is eligible, the cost/benefit of this project would have to be positive.				

3.5 Capabilities Assessment

Evaluation/Prioritization of Actions

Each action added to the plan was developed using the Mitigation Action Summary Worksheet shown in Figure SM.8.

Figure SM.8, Mitigation Action Summary Worksheet

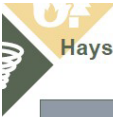


Hays County Hazard Mitigation Plan Update Process
Mitigation Action Summary Worksheet

Community Name:

Person completing questionnaire:

Mitigation Action/ Project Title	
Background/ Issue	
Opportunities for Integration	
Responsible Agency	
Partners	
Strategy for Existing Structures	



Hays County Hazard Mitigation Plan Update Process
Mitigation Action Summary Worksheet

Strategy for Future Development	
Potential Funding	
Cost Estimate (Values from "Measuring Costs" fields from Benefit and Cost Review Worksheet)	
Benefits (Statements from the "Difference" fields on the Benefit and Cost Review Worksheet)	
Timeline	
Priority (Based off Priority worksheet)	

Hays County Hazard Mitigation Plan, City of San Marcos Annex

Table SM.13, Mitigation Action Prioritization (highest hazard priority to lowest)

Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community	Risk Ranking Score	Total Score
28. Evacuation Plans/Alternate road consideration	1	1	1	1	1	1	1	1	1	1	100	110
20. Land Conservation for Mitigation Recharge	1	1	1	1	1	1	1	1	1	1	100	110
7. Increase Public Awareness of Hazard Mitigation	1	1	1	1	0	1	1	1	0	1	100	108
2. Acquisition or elevation of Repetitive Loss Properties	1	1	1	0	1	1	0	1	1	0	100	107
20. Attend Advanced Local Floodplain Management Courses	1	1	1	1	1	1	0	1	0	0	100	107
5. Improve flood warning systems	1	0	1	1	1	0	1	1	0	1	100	107
3. Increase of Warning Signs and Barricades at Low Water Crossings	1	0	1	1	0	0	1	1	1	1	100	107
16. Dam Safety Tabletop Exercises Program	1	1	1	0	1	0	1	1	0	1	100	107
21. Regional Detention/Water Quality Strategy	0	1	1	1	0	1	1	1	0	1	100	107
3. StormReady Designation for San Marcos	1	0	1	1	0	0	1	1	0	1	100	106
15. Adoption of Ordinance for Public Building Structural Engineering Reviews	1	1	1	-1	0	1	1	1	0	1	100	106
19. Extension of River Ridge Parkway West	1	0	1	1	0	0	1	1	0	1	100	106
24. Purchase and Installation of Generators for Temporary Sheltering Efforts	1	0	1	1	0	-1	1	1	0	1	100	105
17. Sessom Creek Improvements	0	0	1	1	0	0	1	1	0	1	100	105
1. Promote Flood Insurance in the community	0	0	1	1	0	0	1	1	0	0	100	104
18. Vulnerability Study Adoption for Mitigation	1	0	1	-1	0	0	1	1	0	1	100	104
14. Adoption of Ordinance for Public Land Use Risk Assessment Reviews	1	1	1	-1	0	0	0	1	0	0	100	103
10. Drought Monitoring Program	1	0	1	1	0	1	1	1	0	1	94	101

Table SM.13, Mitigation Action Prioritization (highest hazard priority to lowest) , (cont.)

Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community	Risk Ranking Score	Total Score
9. Coordination of marketing Large Item Pick-up day for Wildfire Mitigation	1	1	1	1	1	1	1	1	1	0	73	82
30. De-icing Capability Enhancements	1	0	1	1	1	1	1	1	0	0	73	80
23. Cooling Plan Development	1	0	1	1	0	0	1	1	0	1	70	76
8. Adopt wildfire maps from Hays County Firewise project	1	1	1	1	0	1	1	1	1	1	52	61
12. Soil Recommendation	0	1	1	-1	0	0	1	-1	0	0	43	44



Hays County Hazard Mitigation Plan, City of San Marcos Annex

Mitigation Actions by Hazard

The mitigation actions are shown with corresponding hazards in Table SM.14 below.

Table SM.14, Mitigation Action Impact, San Marcos

Action Number	Drought	Extreme Heat	Severe Winter Storms	Lightning	Hailstorms	Windstorms	Tornadoes	Expansive Soils	Floods	Land Subsidence	Hurricanes/ Tropical Storms	Earthquakes	Dam/ Levee Failure	Wildfire
1									X					
2									X					
3									X					
4									X					
5									X					
6			X	X	X	X	X		X		X			
7	X	X	X	X	X	X	X	X	X		X	X	X	X
8														X
9				X		X	X							X
10	X													
11									X		X		X	X
12								X						
13			X											
14								X	X			X	X	X
15						X	X		X		X	X		X
16													X	
17									X					
18	X	X	X	X	X	X	X		X		X	X	X	X
19									X					
20	X								X					
21	X								X					
23		X												
24		X	X	X	X	X	X		X		X	X	X	X



3.6 Integration Efforts

Table SM.15 captures ways that the HMP risk assessment, mitigation goals and actions can be integrated into other City of San Marcos documents, programs and regulations.

Table SM.15, Plan Integration Efforts, San Marcos

Name of Document	Type	Item Type	Process for Integration
Haysinformed.com	Program	Action	Link to existing Hays County HaysInformed.com emergency preparedness/awareness page when creating Public Awareness Page for hazards on San Marcos website (Action 6)
City of San Marcos Budget	Document		Seek obligation of funding for floodplain administrator training through available training line item
San Marcos Flood Protection Plan 2007	Plan		Seek participation of Mitigation Planning Committee member for updates of Flood Protection plan in order to ensure that existing flood projects continue on into the next plan if they are not completed by the time the next update period is conducted.
San Marcos Water Master Plan Update 2016	Plan	Goals	Participate in the plan update for the plan and seek more solutions that meet both water quality and conservation goals but also those of flood control.
San Marcos Transportation Master Plan		Actions	Participate in Transportation Master Plan Update and seek further explanation on which projects benefit the floodplain so that those can be added to the Hazard Mitigation Plan.
Vision San Marcos: A River Runs Through Us- Comprehensive Plan		Risk Assessment	Participate in the Comprehensive Plan Update in order to present hazard data for consideration when zoning and future development is considered within the City.
Hazard Mitigation Grant Program (HMGP)	Funding	Action	Identify actions that can be funded through new and existing grant awards. Review existing mitigation actions for eligibility for the grant program, to include Benefit Cost consideration. Prepare grant application documents in advance to prepare for future grant periods. Process involves identification of actions from Plan; obtaining Council approval to apply; notification of interest in grant to the public; completion of application for funding; if awarded, obtaining Council approval to accept; if accepted, administration of funds and implementation of project.
Pre-Disaster Mitigation (PDM)			
Flood Mitigation Assistance (FMA)			
TWDB Flood Protection Planning (FPP) Grant			



Hays County Hazard Mitigation Plan, City of San Marcos Annex

Table SM.15, Plan Integration Efforts, San Marcos

Name of Document	Type	Item Type	Process for Integration
TWDB Clean Water State Revolving Fund (CWSRF)	Funding	Action	Identify actions that can be funded through new and existing loan programs. Review existing mitigation actions for eligibility for the loan program, to include Benefit Cost consideration. Prepare loan application documents in advance to prepare for future loan periods.
Texas Water Development Fund (DFund)			Process involves obtaining Council approval to apply; notification of interest in loan to the public; completion of application for loan; if awarded, obtaining Council approval to accept; if accepted, administration of funds and implementation of project.

Incorporation Achievements Since Previous Plan Update

The City of San Marcos incorporated the HMP into other planning mechanisms as a demonstration of progress in local hazard mitigation efforts. This was achieved by identifying MPC planners and or stakeholders to participate in the following local planning efforts:

- San Marcos Water Master Plan Update 2016
- Vision San Marcos: A River Runs Through Us- Comprehensive Plan



Section 4: Finalize Plan Update (Review, Evaluation, and Implementation)

4.1 Changes in Development

The City of San Marcos has been named one of the fastest growing populations in America for 3 years within the past 5 years by Time Magazine (Time, 2015). The booming growth in this college town is not only seen in residents but also in industry. Recently, Amazon built a distribution center in the community, bringing in 3,000 employees. With higher numbers of students and employees on the road into and around San Marcos, the community has had to take measures to expand and improve roads as well. These changes could result in increased vulnerability to natural hazards due to the concentration of a transient workforce within the area.

4.2 Progress in Mitigation Efforts

Past Mitigation Action Progress Reports Summary - Completed and Canceled

2011 Action Number	Hazard	Item Description	Lead Department
4	Flood	Adopt "Higher Standard" Flood Damage Prevention Ordinance	City of San Marcos
Cost Estimate/Funding		Schedule	Status as of 2017
Cost and Funding: Existing staff resources, no cost		Completed	Completed in 2010.
Cost Effectiveness			
Not independently cost-effective			

2011 Action Number	Hazard	Item Description	Lead Department
7	Flood	Increase Participation in the Community Rating System (CRS) Program	City of San Marcos
Cost Estimate/Funding		Schedule	Status as of 2017
Cost and Funding: Existing staff resources		2010	Delayed. Not priority during present planning period. The community already participates in CRS.
Cost Effectiveness			
Not independently cost-effective			

2011 Action Number	Hazard	Item Description	Lead Department
9	All Hazards	Improve Emergency Communication Capabilities	City of San Marcos
Cost Estimate/Funding		Schedule	Status as of 2017
\$620,000 Funding: Capital Area Planning Council of Governments (CAPCOG)		Completed	Completed.
Cost Effectiveness			
Not independently cost-effective			



Hays County Hazard Mitigation Plan, City of San Marcos Annex

2011 Action Number	Hazard	Item Description	Lead Department
10	All hazards	Development of and maintenance of County-wide and individual community HAZMAP Plans	City of San Marcos
Cost Estimate/Funding		Schedule	Status as of 2017
Existing staff resources		Completed	Completed.
Cost Effectiveness			
Not independently cost-effective			

2011 Action Number	Hazard	Item Description	Lead Department
12	Extreme Heat	Reduce Impacts of Extreme Heat on Elderly, Disabled, Low-Income and Infants (Fan Distribution Program)	City of San Marcos
Cost Estimate/Funding		Schedule	Status as of 2017
\$2,000 to purchase and distribute 100 box fans and \$3,000 estimated cost for a/c repairs; Funding Sources: United Way, Rotary Clubs, Lion Clubs, Red Cross, Churches and charitable organizations, power companies		Completed	Completed.
Cost Effectiveness			
Not independently cost-effective			

2011 Action Number	Hazard	Item Description	Lead Department
14	Tornadoes	Encourage Construction of Tornado "Safe Rooms"	City of San Marcos- Building
Cost Estimate/Funding		Schedule	Status as of 2017
Funding: Texas DEM, CAPCOG		Completed	Completed.
Cost Effectiveness			
Not independently cost-effective			

2011 Action Number	Hazard	Item Description	Lead Department
15	Tornadoes, thunderstorms and high winds	Building Code Improvements	City of San Marcos- Building
Cost Estimate/Funding		Schedule	Status as of 2017
Funding: Texas DEM, CAPCOG		Completed	Completed.
Cost Effectiveness			
Not independently cost-effective			



Hays County Hazard Mitigation Plan, City of San Marcos Annex

2011 Action Number	Hazard	Item Description	Lead Department
16	Drought	Make San Marcos Drought Resistant	City of San Marcos Water Dept.
Cost Estimate/Funding		Schedule	Status as of 2017
\$20,000 Study Cost; Funding: Texas Water Development Board		Completed	Completed.
Cost Effectiveness			
Not independently cost-effective			

2011 Action Number	Hazard	Item Description	Lead Department
17	Drought	Construct Needed Water System Improvements in Lower Colorado Region K and South Central Texas Region L	City of San Marcos Engineering
Cost Estimate/Funding		Schedule	Status as of 2017
\$472 million (South Central Texas Region- 21 counties) \$256 million (14 Lower Colorado Region); Funding sources: TWDB, GBRA, LCRA		Completed	Completed. Converted water supply to San Marcos to 80% surface water and 20% aquifer
Cost Effectiveness			
Not independently cost-effective			

2011 Action Number	Hazard	Item Description	Lead Department
18	Flood	Promote Flood Insurance	City of San Marcos
Cost Estimate/Funding		Schedule	Status as of 2017
\$2,000		Ongoing	Removed. Repeated in Action 1.
Cost Effectiveness			
Not independently cost-effective, but the initial step in identifying appropriate mitigation actions			

2011 Action Number	Hazard	Item Description	Lead Department
21	Extreme Heat	Evaluate Excess Heat Risks Study	City of San Marcos
Cost Estimate/Funding		Schedule	Status as of 2017
No additional cost-uses existing staff resources		TBD: Probably initiated in 2011	Canceled. Replaced with other extreme heat actions.
Cost Effectiveness			
Not independently cost-effective, but needed to develop adequate risk reduction efforts			



4.3 Changes in Priorities

Plan-level priority changes are reflected in the changes to the plan-level goals shown in Chapter 3: Mitigation Strategy within the Main Plan document. As with many of the communities in Hays County, San Marcos' priorities revolve around water, the abundance and the scarcity, through flooding and drought hazards. As floods destroy structures and endanger lives, droughts threaten the availability of the necessary resources. In an effort to ensure that the supply of water is secure for their citizens, San Marcos has adopted many conservation approaches and actions. Considering and prioritizing land conservation and aquifer focused efforts, the community is making many efforts to mitigate the dangers of both hazards.



Section 5: Approval and Adoption

5.1 Approval and Adoption Procedure

The procedures for approval and adoption are described in Chapter 4.1 of the main plan document.

Table SM.16, Municipal Jurisdiction Adoption Date

Municipality	APA Date	Adoption Date
San Marcos		

Approval and Adoption





Jurisdiction Adoption Documentation Placeholder

References

- Alan Plummer Associates, Inc. (2016, 05 19). San Marcos, Tx: Master Plans. Retrieved from San Marcos Water Master Plan Update: <http://www.sanmarcostx.gov/modules/showdocument.aspx?documentid=20325>
- City of San Marcos. (2013, 04 16). Planning & Development Services. Retrieved from Vision San Marcos: Comprehensive Plan: <http://www.sanmarcostx.gov/index.aspx?page=733>
- City of San Marcos. (2017, 03 20). Fast Facts. Retrieved from City of San Marcos Profile 2017: <http://www.ci.san-marcos.tx.us/index.aspx?page=358>
- Espey Consultants. (2007, 10 25). San Marcos, TX: Master Plans. Retrieved from Flood Protection Plan: <http://www.sanmarcostx.gov/modules/showdocument.aspx?documentid=8090>
- Greater San Marcos Partnership. (2017, 03 20). Major Employers. Retrieved from Greater San Marcos Region Major Employers : <http://www.greatersanmarcostx.com/major-employers>
- Municode. (2017, 03 20). San Marcos, Texas. Retrieved from Code of Ordinances: https://www.municode.com/library/tx/san_marcos/codes/code_of_ordinances?nodeId=SPBLADECO_CH1DEPR
- National Fire Protection Association. (2013, June). NFPA News & Research. Retrieved from Lightning Fires and Lightning Strikes: <http://www.nfpa.org/news-and-research/fire-statistics-and-reports/fire-statistics/fire-causes/lightning-fires-and-lightning-strikes>
- National Highway Traffic Safety Administration. (2017, 03 11). Traffic Safety Facts. Retrieved from Texas 2011-2015: <https://cdan.nhtsa.gov/SASStoredProcess/guest>
- National Oceanic and Atmospheric Administration. (2016). Historical Hurricane Tracks. Retrieved from National Oceanic and Atmospheric Administration Coastal Management: <https://coast.noaa.gov/hurricanes/>
- National Oceanic and Atmospheric Administration Storm Event Database. (2016, 12 01). National Centers for Environmental Information. Retrieved from Data Access: <https://www.ncdc.noaa.gov/data-access>
- Texas A&M Forest Service. (2016, 12 01). Wildfire Risk Assessment Portal. Retrieved from Public Viewer: <https://www.texaswildfirerisk.com/>
- Texas Department of Transportation. (2017, 03 11). Crash Records Information System. Retrieved from C.R.I.S Query: <https://cris.dot.state.tx.us/public/Query/#/public/welcome>
- Texas Natural Resources Information System. (2011). TNIRIS Data Catalog Low Water Crossings. Retrieved from TNIRIS: <https://tnris.org/data-catalog>
- Time. (2015, 02 21). Economics. Retrieved from These Are the Fastest Growing Cities in America: <http://time.com/3892311/fastest-growing-cities/>
- Tornado Facts. (2016, 03 16). Tornado Facts and Information . Retrieved from Tornado Scale: <http://www.tornadofacts.net/tornado-scale.php>
- USGS Earthquake Hazard Program. (2015). USGS Earthquake Hazard Program. Retrieved from USGS: <https://earthquake.usgs.gov/data/>
- Wilbur Smith Associates. (2004, 05 30). San Marcos, Tx: Master Plans. Retrieved from San Marcos Transportation Master Plan: <http://www.sanmarcostx.gov/modules/showdocument.aspx?documentid=3920>

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City of Uhland
Hays County Hazard
Mitigation Plan Update
2018



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City of Uhland Annex

Section 1: Organize and Review

This section contains a brief description of the City of Uhland and its jurisdictional features. In addition, Section 1 contains the following details regarding Uhland's:

- participation in the Hays County HMP Update process,
- stakeholder engagement,
- public outreach strategy,
- incorporation efforts and
- plan maintenance procedures.

*Population :	458
Size of Community:	2.49 sq. miles
*Population over 65 years old	30
*Population under 16 years old	155
*Economically Disadvantaged Population (\$0-\$20k)	17

Uhland is serviced by the following responders:

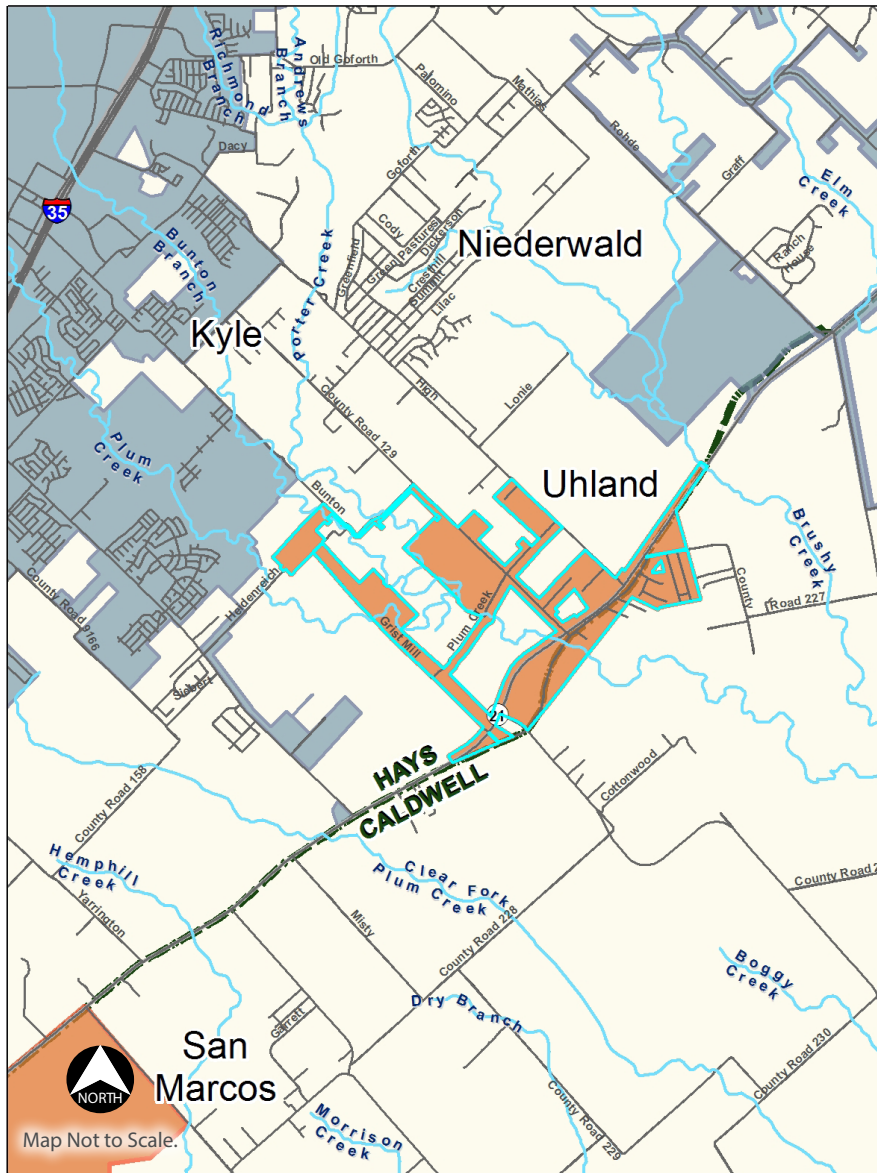
Fire: Chisholm Trail Fire Rescue

EMS: San Marcos Hays County EMS/Caldwell EMS

Law Enforcement - Hays County Sheriff's Office

**HAZUS-MH 3.2 Updated Census 2010 Population Estimates*

Figure UH.1, City of Uhland Planning Area



1.1 Community Description

When planning, it is important to take into account the characteristics that make a community unique. Consideration of unique needs when it comes to mitigating or recovering from natural hazards ensures that all members of the community and their needs are addressed.

Known as “The last stagecoach stop in Texas”, Uhland is located along the Old Spanish Trail. Now located on State Highway 21, Uhland is a quickly developing community, interested in industrial and commercial growth. Although HAZUS-MH 3.2 Census 2010 Population Estimates show a population of 458, the City of Uhland website provides a current population of 1,030 residents. With a population that doubled in a matter of 7 years, the community shows signs of continued growth in coming years.

A unique characteristic for the City of Uhland is that it resides in both Hays and Caldwell Counties.

Hays County Hazard Mitigation Plan, City of Uhland Annex

Uhland is a general law municipality that incorporated in 1985. The community is governed by 4 Council members, a Mayor Pro-Tem, and Mayor. The elected officials are supported by a City Administrator.

City of Uhland students are served by Hays Consolidated Independent School District (HCISD).

Uhland's major employers are listed in UH.1 and main utility providers in Table UH.2 below.

Table UH.1, Major Employers

Business Type	Name of Employer
Small Industrial	Oyster Designs
Retail	Bon Ton Meat Market & Country Store
Industrial	Fire Star Concrete, Inc.

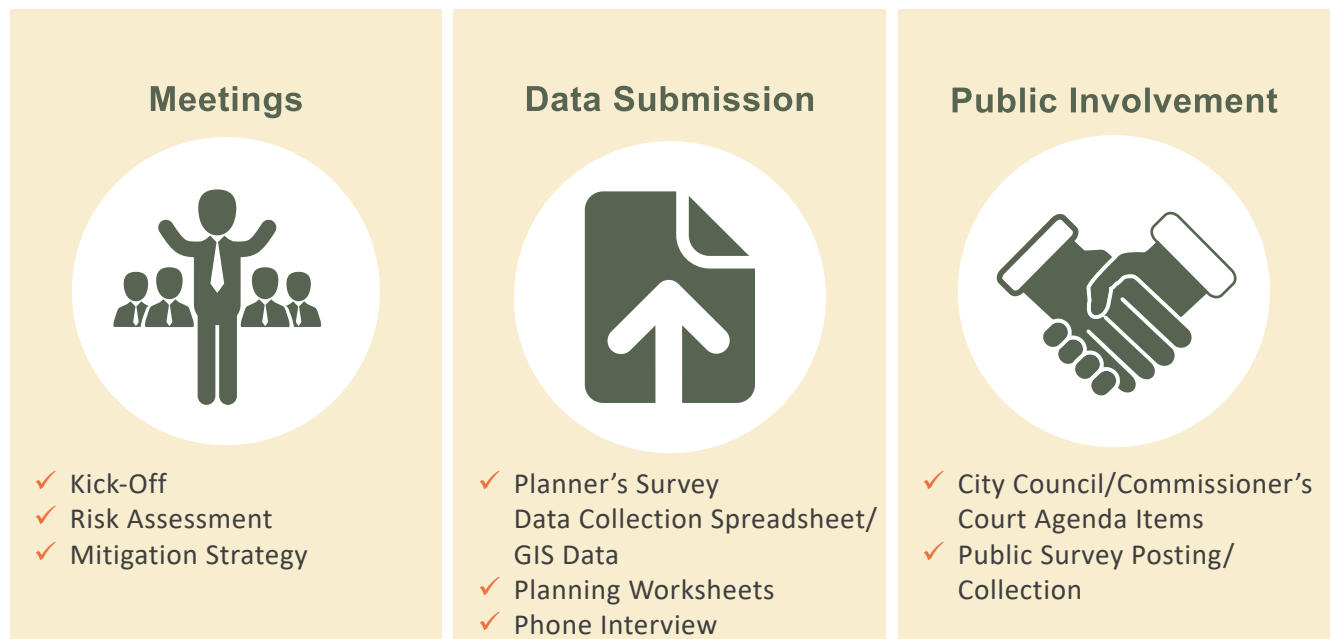
Table UH.2, Utility Providers

Type	Provider
Electric	Bluebonnet Electric/Pedernales Electric Cooperative (PEC)
Water	County Line Special Utility District

Community Planning Involvement

MPC planning activities for the Hays County Hazard Mitigation Plan (HMP) Update are captured in Figure UH.2, which utilizes check marks to indicate each of the activities that were completed by Uhland MPC members.

Figure UH.2, City of Uhland Plan Participation



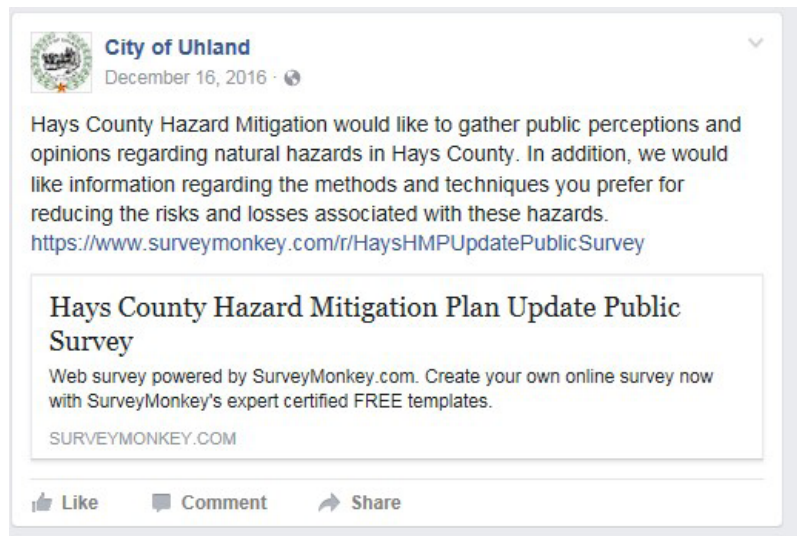


1.2 Outreach Strategy

The City of Uhland was very active in the following outreach activities used to request public participation in the Hays County HMP Update. Their activities included promotion of the HMP Public Survey, a City Council announcement, plan phase newsletter distribution and a draft plan public comment period.

Public Survey Promotion

Uhland advertised the Hays County Hazard Mitigation Plan Update Public Survey on the Uhland homepage at www.cityofuhland.com as well as the community Facebook page.



As of March 10, 2017, Uhland had 13 residents respond to the public survey. Details on how the survey data was directly incorporated into the Risk Ranking process for hazards is included in Chapter 2, the risk assessment portion of the main plan document.

City Council Meeting Announcement

On February 1, 2017, the Mayor presented information on the Hays County Hazard Mitigation Plan Update to the Uhland City Council. Elected officials, local agency leaders and members of the public attended the meeting. The council agenda and item report for this presentation is included in Plan Appendix A.

Plan Phase Newsletters

Uhland was provided with newsletters at each phase of the planning process in order to be able to share updates on the planning process with stakeholders, elected officials, City staff and the public. Copies of the newsletters can be found in Plan Appendix A.

Plan Draft Public Review and Comment Period

The link to the draft Hays County HMP (hosted on the Hays County Office of Emergency Services page) was posted on the City of Uhland website from July 12, 2017 until July 26, 2017. A hard copy was placed in the Uhland City Hall for public review. No public comments were received during this review period.



1.3 Incorporation of Sources

In addition to stakeholder and public input, the MPC also reviewed other City planning resources that could provide useful information for the plan update process. Table UH.3 lists the documents reviewed and how they were considered for incorporation in the updated plan.

Table UH.3, Review/Incorporation of Sources

Name of Document	Type	How Incorporated
2013 State of Texas Hazard Mitigation Plan	Plan	Utilized hazard definitions and hazard classification names.
Flood Insurance Study	Study	Incorporated best available hydraulic and hydrologic study results for flood hazard profile.
Uhland City Ordinances	Regulations	Reviewed for possibility of enhancement for mitigation purposes (detailed in Section 3: Mitigation Strategy- Existing Capabilities).
City of Uhland Zoning Map	Plan	Reviewed for development review purposes to update plan with latest development trends (Southwest Engineers, 2016).
City of Uhland Residential Building Permit	Form	Reviewed for floodplain review reference in permitting for development- none found (City of Uhland, 2017).



Section 2: Risk Assessment

City of Uhland Jurisdictional Hazards

This section contains Uhland's hazard profiles for each natural hazard included in the Hays County HMP Update. Profiles include:

- Location - the area where the hazard is known to occur
- Previous Occurrences - a history of reported events for the hazard
- Significant Previous Occurrences (when applicable) - notable hazard events within the community
- Extent - the strength or magnitude of the hazard
- Probability - the likelihood of the hazard event occurring in the future
- Impact - the consequence or effect (or possible effect) of hazard events
- Vulnerability Summary - identification of structures, systems, populations or assets susceptible to loss or damage and how they are/could be impacted

Hazard descriptions and extent scales for hazard magnitudes, are found in Chapter 2, the risk assessment portion of the main plan document.

When available, data specific to Uhland was used for hazard analysis. When no instances were reported specifically for the jurisdiction for regional hazards, County-wide data was applied.

State and national datasets were used to determine occurrence, extent, and the respective probabilities, rather than verbal testimonies, in an effort to retain data consistency. For some hazards, the National Oceanic and Atmospheric Administration (NOAA) Storm Events Database was used as the most comprehensive data available for hazards. The Storm Events Database does not always reflect the most recent totals for fatality, injury and damage amounts shown for previous hazard occurrences. The Previous Occurrences paragraphs identify instances in which this may occur. Verbal testimony, when available, was integrated into impact or vulnerability summaries to account for updates in this data.

2.1 Hazard Profiles

Hazards profiled within the Risk Assessment include:

- Drought - Within Chapter 2, the risk assessment portion of the main plan document.
- Extreme Heat - Within Chapter 2, the risk assessment portion of the main plan document.
- Severe Winter Storms - Within Chapter 2, the risk assessment portion of the main plan document.
- Lightning - Within Chapter 2, the risk assessment portion of the main plan document.
- Hailstorms
- Windstorms
- Tornadoes
- Expansive Soils
- Floods
- Hurricanes/Tropical Storms
- Earthquakes
- Dam/Levee Failure
- Wildfires



Hailstorms

Hailstorms: Location

The entire extent of the City of Uhland is exposed to some degree of hail hazard. Since hail can occur at any location, hail events could be experienced anywhere within the planning area.

Hailstorms: Previous Occurrences

While the City of Uhland has not had any previous occurrences reported through the NOAA Storm Events Database, if an event were to occur, it would be similar in size and magnitude to events within the surrounding County area.

Hailstorms: Extent and Probability

The Tornado and Storm Research Organization (TORRO) created a hail extent index to measure hail called the Hailstorm Intensity Scale. According to the reported previous hail occurrences for the planning area, the maximum hail extent experienced was up to 3 inches or 76.20 millimeters in diameter. This size corresponds to a TORRO Hailstorm Intensity Scale classification of a “Super Hailstorm.” Refer to Chapter 2, the risk assessment portion of the main plan document, for hail extent scale descriptions.

Based on 57 reported events in 49 years, a hail event occurs in Hays County approximately once a year, on average. Since hail events can happen anywhere throughout the HMP update area, the City of Uhland’s future probability is assumed to be similar to the surrounding County area. The City’s probability for a hail event is approximately once every year (on average) in the future, with hail up to 3 inches, or 76.20 millimeter in diameter, corresponding to a TORRO Hailstorm Intensity Scale classification of a “Super Hailstorm.”

Hailstorms: Impact

Based on the maximum hail extent experienced (76.20 mm) in the surrounding County area, the TORRO Hailstorm Intensity Scale indicates that impact can be expected to include any of the following:

- Varying degrees of damage to vegetation and crops
- Damage to plastic structures
- Varying degrees of damage to glass
- Paint and wood scored
- Vehicle bodywork damage
- Varying degrees of roof damage
- Varying degrees of risk of injuries
- Varying degrees of aircraft damage
- Brick walls pitted
- Risk of severe or even fatal injuries to persons caught in the open

Hailstorms: Vulnerability Summary

The City has not experienced significant past damage to public property due to hail. This could be attributed to the City’s roofs being constructed of corrugated tin, which is less susceptible to hail damage than shingle roofs. However, damages could still occur to the roofs and windows, as there is no other hardening or retrofitting in place. Additionally, there are several pieces of City equipment to include: a truck, a tractor and zero-turn mower. These are kept in a barn that was formerly the fire department building.



Windstorms

Windstorms: Location

The entire extent of the City of Uhland is exposed to some degree of wind hazard. Since wind can occur at any location, wind events could be experienced anywhere within the planning area.

Windstorms: Previous Occurrences

While the City of Uhland has not had any previous occurrences reported through the NOAA Storm Events Database, if an event were to occur, it would be similar in size and magnitude to events within the surrounding County area. Community testimony accounts of damage, without specific dates and damage costs, are noted in the vulnerability summary section of this profile.

Windstorms: Extent and Probability

Wind is measured by the Beaufort Wind Scale that relates wind speed to observed conditions on land and sea. According to the reported previous windstorm occurrences in the planning area, the maximum wind extent experienced was 70 knots windstorm occurrences in the jurisdiction, the maximum wind extent experienced was 70 knots (corresponding to Beaufort Wind Classification: Hurricane). Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of wind extent scales.

Based on 38 reported events in 42 years, a wind event occurs in Hays County approximately once every year, on average. Since wind events can happen anywhere throughout the HMP planning area, the City of Uhland's future probability is assumed to be similar to the surrounding County area. In the future, the City's probability for a wind event of up to 70 knots (Beaufort Wind Classification: Hurricane) is approximately once every year (on average).

Windstorms: Impact

Data available from the Texas Department of Transportation's Crash Records Information System shows that between the years of 2010 and 2017, rural Hays County experienced 5 crashes related to severe crosswind weather conditions (see Table UH.4). There were no injuries reported from these crash events. Since wind events occur on a regional scale, it is assumed that weather related crashes in the surrounding County area would be similar to those experienced in these conditions within Uhland.

Table UH.4, Windstorms, Vehicle Accidents, Hays County

City	Fatality	Incapacitating Injury	Non-Incapacitating Injury	Possible Injury	Crash Year	Street Name	Surface Condition	Weather Condition
Rural Hays County	0	0	0	0	2010	LIME KILN RD	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2017	US0290	Wet	Severe Crosswinds

(Texas Department of Transportation, 2017)





Structures can be damaged by flying debris and impact from winds, damaging rooftops and causing other structural damage. Manufactured homes are especially vulnerable to damage that high winds can cause, to include destruction in the most extreme event conditions.

Critical infrastructure, such as utility poles and street signals, could also be disrupted, impacting all residents in the affected area. Debris on the roadway can also cause obstruction for emergency responders' ability to provide services.

Windstorms: Vulnerability Summary

Uhland has previously experienced debris accumulation in roadways during past windstorm events. According to community testimony, a storm of straight line winds produced city-wide damage around 2008. Buildings and trees susceptible to wind impacts were damaged and resulted in an increase of roadway debris. If similar incidents were to occur in the future, it could impede public safety officials' ability to respond to emergency calls. Additionally, a majority of Uhland's power lines are on poles posing a vulnerability due to impact on homes and businesses from potential electricity outages during windstorms that could result from damage to power lines. An abundance of dead trees creates additional risk from the potential of dead limbs falling on the lines.

It is estimated that 90% of Uhland's residences are manufactured homes, the remaining 10% are site-built homes outside of preplanned subdivisions. All subdivisions in Uhland are comprised of manufactured homes, a total of 7 subdivisions with a total of 474 lots. These structures are more vulnerable to damage from severe winds than site-built homes. Additionally, Uhland City Hall is not retrofitted to mitigate against the impacts of severe wind damage. Damage to City Hall could lead to delays in getting assistance for members of the community.





Tornadoes

Tornadoes: Location

The entire extent of the City of Uhland is exposed to some degree of tornado hazard. Since tornadoes can occur at any location, tornado events can be experienced anywhere within the planning area.

Tornadoes: Previous Occurrences

While the City of Uhland has not had any previous occurrences reported through the NOAA Storm Events Database, if an event were to occur, the event would be similar in size and magnitude to events within the surrounding County area. Table UH.5 lists the 16 tornado events reported for Hays County and its unincorporated jurisdictions since the year 1953.

Fatality, injury and damage amounts are shown in Table UH.5, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table UH.5, Tornado Events, Hays County

Location	Date	Type	Magnitude (mm)	Fatalities	Injuries	Property Damage	Crop Damage
Hays County	4/28/1953	Tornado	F3	1	5	250,000.00	0.00
Hays County	4/30/1954	Tornado	F1	0	0	250,000.00	0.00
Hays County	5/2/1958	Tornado	F1	0	0	30.00	0.00
Hays County	11/12/1961	Tornado	F2	0	0	2,500.00	0.00
Hays County	9/20/1967	Tornado	NA	0	0	250.00	0.00
Hays County	9/20/1967	Tornado	NA	0	0	30.00	0.00
Hays County	5/10/1975	Tornado	F1	0	0	25,000.00	0.00
Hays County	3/30/1976	Tornado	F2	0	0	25,000.00	0.00
Hays County	3/30/1976	Tornado	F2	0	1	250,000.00	0.00
Hays County	8/10/1980	Tornado	F2	0	0	25,000,000.00	0.00
Hays County	4/22/1985	Tornado	F2	0	0	250,000.00	0.00
Hays County	8/22/1991	Tornado	F1	0	0	2,500.00	0.00
Countywide	5/13/1994	Tornado	F0	0	0	500.00	500.00
Henly	11/15/2001	Tornado	F0	0	1	50,000.00	0.00
Driftwood	10/8/2002	Tornado	F0	0	0	70,000.00	0.00
M. Gainor	5/23/2015	Tornado	EF0	0	0	0.00	0.00
Total				1	7	\$26,175,810.00	\$500.00

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)

Tornadoes: Extent and Probability

Tornadoes are measured by severity on the Fujita and Enhanced Fujita Scales, with a range from 0-6. According to the reported previous tornado occurrences in the planning area, the maximum tornado extent experienced was a category F3. Refer to Chapter 2, the risk assessment portion of the main plan document for a description of tornado extent scales, Fujita (F) Scale and Operational Enhanced Fujita (EF) Scale.

Based on 16 reported events in 63 years, a tornado event occurs approximately every 4 years on average in Hays County. City of Uhland's future probability is assumed to be similar to the surrounding County area. The City's probability of a tornado event is approximately once every 4 years (on average) in the future, with up to an F3 magnitude.





Tornadoes: Impact

There is not specific event data available for the City of Uhland, from which impacts would be calculated. However, it can be assumed that impacts would be similar to those that the surrounding County area experiences.

Hays County has experienced tornadoes between F0 and F3 levels in the past. If similar events were to happen in the future in the City, the type of impacts that the planning area could expect associated with those magnitudes would include (from least to greatest severity):

- Light Damage - Broken branches; shallow rooted trees pushed over; some chimney damage.
 - Moderate Damage - Surface damage to roofs; mobile homes pushed off foundation; moving vehicles pushed off the road.
 - Significant Damage - Frame houses have roof torn off; mobile homes completely destroyed; train boxcars overturned; large trees snapped or uprooted; smaller debris turned into missiles.
 - Severe Damage - Roofs completely torn off well-constructed building, along with some walls; majority of trees uprooted; trains overturned, vehicles lifted off the ground.
- (Tornado Facts, 2016)

Structures can be damaged by flying debris and impact from tornado winds, damaging rooftops and causing other structural damage. Manufactured homes are especially vulnerable to damage that tornadoes can cause, to include destruction in higher magnitude events.

Critical infrastructure, such as utility poles and street signals, could also be disrupted, impacting all residents in the affected area. Debris on the roadway can also cause obstruction for emergency responders' ability to provide services.

Tornadoes: Vulnerability Summary

It is estimated that 90% of Uhland's residences are manufactured homes, the remaining 10% are site-built homes outside of preplanned subdivisions. All subdivisions in Uhland are comprised of manufactured homes, a total of 7 subdivisions with a total of 474 lots. These structures are more vulnerable to severe damage from tornadoes than site-built homes. Currently, the Uhland Community Center can be used as a shelter option, but its application will be limited by the lack of a tornado warning system or mass notification tool. Additionally, Uhland City Hall is not retrofitted to mitigate against the impacts of tornado damage. Damage to City Hall could lead to delays in getting assistance for members of the community.

Uhland has previously experienced debris accumulation in roadways during past windstorm events. Such incidents could impede public safety officials' ability to respond to emergency calls. This displays vulnerability as strong winds and debris accompany tornado events. Additionally, a majority of Uhland's power lines are on poles posing a vulnerability due to impact on homes and businesses from potential electricity outages during tornado events that could result from damage to power lines. An abundance of dead trees creates additional risk from the potential of dead limbs falling on the lines.





Expansive Soils

Expansive: Soils Location

Figure 2.3 within Chapter 2 (the Risk Assessment portion within the Hays County HMP Update) shows the location of expansive soil areas for the Village. The entire extent of the jurisdiction is classified as having over 50% of the City underlain by soils with abundant clays with high swelling potential, therefore all of the jurisdiction is equally at risk.

Expansive Soils: Previous Occurrences

There was no documentation of site-specific past events of structural damage due to expansive soils from State or national datasets found.

Expansive soils cannot be documented as a time-specific event, except when they lead to structural and infrastructure damage. There are no specific damage reports or historical records of events in the City, other than the community testimony that was offered without data. These accounts can be used for vulnerability statement purposes, however the lack of data for these instances does not allow for the incorporation of this information for the extent and probability determinations.

Expansive Soils: Extent and Probability

Local community testimony indicates that the instances of expansive soils are frequent and that the effects are evident throughout the community. With this in mind, the probability of events occurring within the planning area is more accurately reported as high (10 - 20 occurrences in the next 10 years affecting up to 20 structures).

Expansive Soils: Impact

According to community testimony, large areas within the City of Uhland have expansive soils that have affected structures. In the case of some manufactured and mobile homes, the expansion has previously created cracking in the base pads that the structures were placed on. In some cases, it has even caused the beginning of separation of the structure at the seams of a double-wide trailer. The City of Uhland has acted rapidly and aggressively to address the issue of expansive soils and has taken measures to mitigate against this impact.

Expansive Soils: Vulnerability Summary

Every subdivision within the City of Uhland is a mobile/manufactured home park and 90% of the residential structures within the community are mobile/manufactured homes. In response to the vulnerability of manufactured and mobile homes and the pads that they rest upon, the City of Uhland passed an ordinance that requires an engineered concrete foundation be constructed for any mobile or manufactured homes to be built within the City limits. This greatly decreases the vulnerability for these homes.

As the community looks to continue to grow in both residential and industrial markets, they are working diligently to ensure that they adopt safe growth measures and processes.





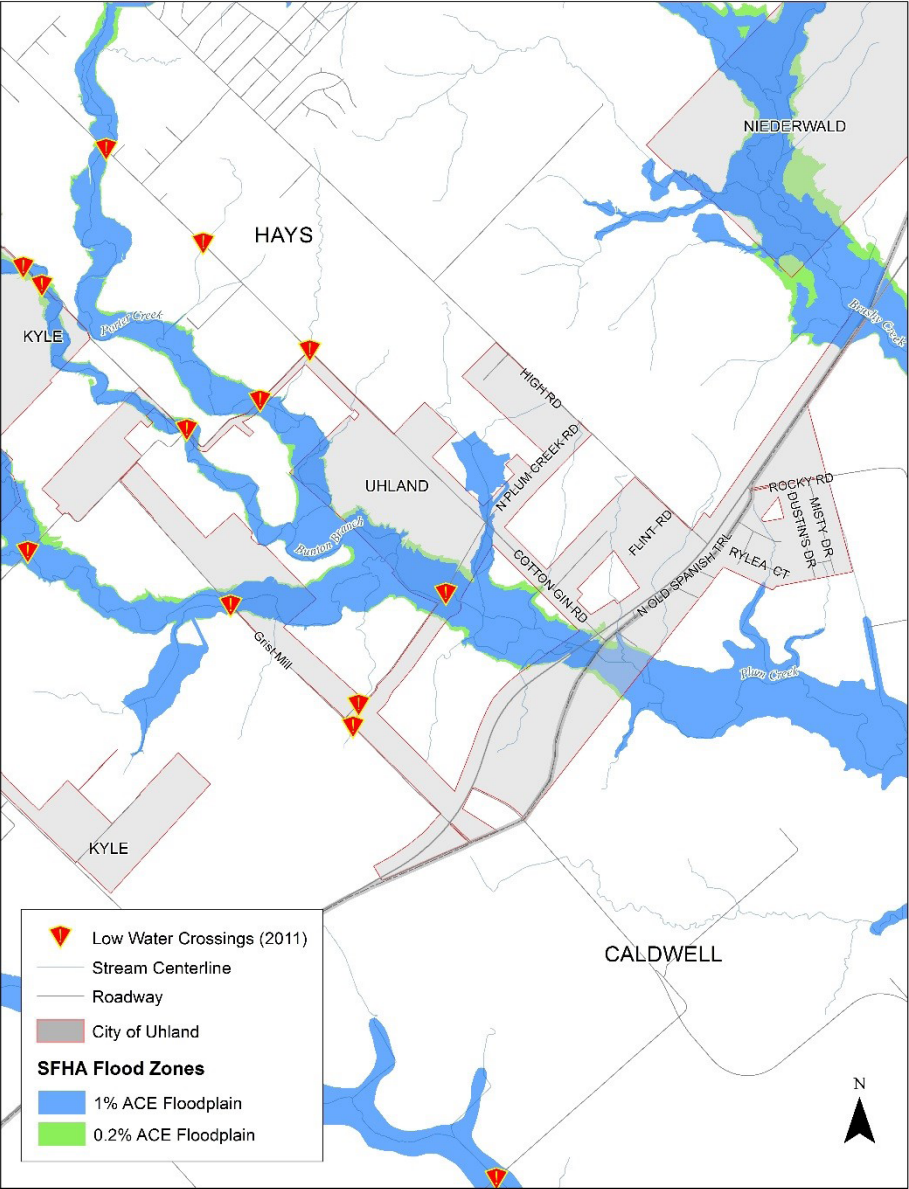
Floods

Floods: Location

The location of low water crossings, as well as the 1% (100 year) and 0.2% (500 year) Annual Chance Event (ACE) floodplains for the City of Uhland are shown in Figure UH.3. This figure represents the areas that are most affected by riverine flooding and is based upon newly developed hydrologic and hydraulic analysis.

This new analysis is considered the best information available to date. Table UH.6 provides the total acreage in the jurisdiction that is located in the 1% and 0.2% floodplains.

Figure UH.3, Special Flood Hazard Areas and Low Water Crossings, City of Uhland



(Texas Natural Resources Information System, 2011)

Table UH.6, City of Uhland Floodplain Acreage

Jurisdiction	100yr (1%) Floodplain Acres (Includes Floodway)	500yr (0.2%) Floodplain Acres (Includes 100yr)
City of Uhland	190	216



Floods: Previous Occurrences

Hays County was included in 3 Federal disaster declarations between 2013 and 2015, all related to flooding. Although there were no flood events reported specifically for the City of Uhland in the NOAA Storm Events Database, Table UH.7 lists the 69 documented events reported for Hays County and its unincorporated jurisdictions from year 1997 to 2016. Due to the size and extent of some flood occurrences as well as the regional or zonal nature of reports in the NOAA Storm Events Database, the City of Uhland may have been affected by many of the events that were reported for the surrounding areas.

Fatality, injury and damage amounts are shown in Table UH.7, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table UH.7, Flood Events, Hays County

Location	Date	Type	Fatalities	Injuries	Property Damage	Crop Damage
Countywide	5/23/1997	Flash Flood	0	0	10,000.00	0.00
Countywide	6/6/1997	Flash Flood	0	0	10,000.00	0.00
Countywide	6/7/1997	Flash Flood	0	0	15,000.00	0.00
Countywide	6/8/1997	Flash Flood	2	7	2,500,000.00	50,000.00
Countywide	6/21/1997	Flash Flood	0	0	5,000.00	0.00
Countywide	6/22/1997	Flash Flood	0	0	50,000.00	50,000.00
Countywide	2/21/1998	Flash Flood	0	0	5,000.00	0.00
Countywide	7/3/1998	Flash Flood	0	0	20,000.00	0.00
Countywide	8/22/1998	Flash Flood	0	0	20,000.00	10,000.00
Countywide	8/23/1998	Flash Flood	0	0	10,000.00	0.00
Countywide	10/17/1998	Flash Flood	0	100	500,000.00	50,000.00
HAYS (ZONE)	10/17/1998	Flood	0	25	4,000,000.00	50,000.00
HAYS (ZONE)	10/17/1998	Flood	0	25	4,000,000.00	50,000.00
Countywide	6/21/1999	Flash Flood	0	0	3,000.00	0.00
Countywide	6/9/2000	Flash Flood	0	0	15,000.00	0.00
Countywide	11/2/2000	Flash Flood	0	0	20,000.00	0.00
HAYS (ZONE)	11/4/2000	Flood	0	0	0.00	0.00
North Portion	8/26/2001	Flash Flood	0	0	10,000.00	0.00
Countywide	8/31/2001	Flash Flood	0	0	20,000.00	0.00
Countywide	8/31/2001	Flash Flood	0	0	30,000.00	20,000.00
Countywide	11/15/2001	Flash Flood	0	20	200,000.00	50,000.00
HAYS (ZONE)	11/15/2001	Flood	0	0	0.00	0.00
West Portion	6/30/2002	Flash Flood	0	0	10,000.00	0.00
HAYS (ZONE)	7/1/2002	Flood	0	0	0.00	0.00
South Portion	7/1/2002	Flash Flood	0	0	0.00	0.00
Countywide	7/2/2002	Flash Flood	0	0	0.00	0.00
West Portion	7/3/2002	Flash Flood	0	0	0.00	0.00
West Portion	7/5/2002	Flash Flood	0	0	0.00	0.00



Hays County Hazard Mitigation Plan, City of Uhland Annex

Table UH.7, Flood Events, Hays County (cont.)

Location	Date	Type	Fatalities	Injuries	Property Damage	Crop Damage
South Portion	9/19/2002	Flash Flood	0	0	0.00	0.00
South Portion	10/24/2002	Flash Flood	0	0	0.00	0.00
Countywide	11/4/2002	Flash Flood	0	0	0.00	0.00
Countywide	2/20/2003	Flash Flood	0	0	10,000.00	0.00
West Portion	6/13/2003	Flash Flood	0	0	5,000.00	0.00
South Portion	9/11/2003	Flash Flood	0	0	3,000.00	0.00
Northwest Portion	1/16/2004	Flash Flood	0	0	3,000.00	0.00
East Portion	6/5/2004	Flash Flood	0	0	0.00	0.00
Countywide	6/9/2004	Flash Flood	0	0	350,000.00	0.00
Driftwood	6/26/2004	Flash Flood	0	0	0.00	0.00
West Portion	6/27/2004	Flash Flood	0	0	0.00	0.00
West Portion	6/28/2004	Flash Flood	0	0	0.00	0.00
Countywide	6/29/2004	Flash Flood	0	0	0.00	0.00
South Portion	6/30/2004	Flash Flood	0	0	0.00	0.00
HAYS (ZONE)	6/30/2004	Flood	0	0	0.00	0.00
West Portion	7/25/2004	Flash Flood	0	0	0.00	0.00
Countywide	10/2/2004	Flash Flood	0	0	0.00	0.00
Countywide	10/23/2004	Flash Flood	0	0	0.00	0.00
HAYS (ZONE)	10/23/2004	Flood	0	0	0.00	0.00
HAYS (ZONE)	10/24/2004	Flood	0	0	0.00	0.00
Countywide	11/16/2004	Flash Flood	0	0	0.00	0.00
HAYS (ZONE)	11/17/2004	Flood	0	0	0.00	0.00
Countywide	11/21/2004	Flash Flood	0	0	0.00	0.00
Countywide	11/22/2004	Flash Flood	0	0	0.00	0.00
Countywide	11/22/2004	Flash Flood	0	0	0.00	0.00
Southeast Portion	11/23/2004	Flash Flood	0	0	0.00	0.00
South Portion	5/6/2006	Flash Flood	0	0	0.00	0.00
Henly	3/30/2007	Flash Flood	0	0	0.00	0.00
Driftwood	3/30/2007	Flood	0	0	0.00	0.00
Henly	5/2/2007	Flash Flood	0	0	0.00	0.00
Henly	7/2/2007	Flash Flood	0	0	0.00	0.00
Henly	5/17/2010	Flash Flood	0	0	0.00	0.00
Driftwood	9/7/2010	Flash Flood	0	0	0.00	0.00
Driftwood	5/10/2012	Flash Flood	0	0	0.00	0.00
Driftwood	5/11/2012	Flash Flood	0	0	0.00	0.00
Fitzhugh	5/17/2015	Flash Flood	0	0	0.00	0.00
Henly	5/30/2015	Flash Flood	0	0	0.00	0.00
Fitzhugh	6/14/2015	Flash Flood	0	0	0.00	0.00
Driftwood	10/30/2015	Flash Flood	0	0	10,000,000.00	0.00
Fitzhugh	5/19/2016	Flash Flood	0	0	0.00	0.00



Table UH.7, Flood Events, Hays County (cont.)

Location	Date	Type	Fatalities	Injuries	Property Damage	Crop Damage
Driftwood	8/16/2016	Flash Flood	0	0	0.00	0.00
Totals			2	177	\$21,824,000.00	\$330,000.00

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)



Floods Significant Past Events

Hays County experienced 3 disaster declarations discussed under Floods: Previous Occurrences. Refer to the *Floods: Significant Past Events* section within the Hays County Annex for narratives discussing these events.

Floods: Extent

Flood extent is described through a combination of ground elevation, river heights, 100-year Water Surface Elevations (WSE's) and HAZUS depth grids. An example of flooding within the jurisdiction is a community along Plum Creek, as this community is exposed to some of the greatest extent of a flood event. This area has an approximate overbank ground elevation of 545 feet with an intersecting 100-year WSE of 547 feet. For a 100 year event, water depth of approximately 2 feet can be expected within this area. A further analysis of the total creek height is described below.

With Plum Creek having an approximate normal in-channel elevation of 537 feet, (per Light Detection and Ranging [LiDAR] data) and an intersecting 100-year WSE of approximately of 847 feet, flood depths would be 10 feet.



Past flooding events in Uhland, Texas



Hays County Hazard Mitigation Plan, City of Uhland Annex

Floods: Probability

Probability has been calculated on the basis of NOAA reported events, as a standard, consistent calculation method for all hazards profiled with the Hays County HMP. Based on 69 reported events in 19 years, a flood event occurs approximately 3 to 4 times per year on average in Hays County and its unincorporated jurisdictions. Due to the size and extent of some flood occurrences, as well as the regional or zonal nature of reports in the NOAA Storm Events Database, the City of Uhland's future probability is assumed to be similar to the surrounding County area. The City can expect a flood event approximately 3 to 4 times per year on average in the future with flood water depths of 10 feet.

Floods: Impact

The following describes the inventory counts and building replacement values for the jurisdictional area.

Uhland Building Counts			
Residential	Commercial	Other	Total
158	5	5	168

Uhland Building Replacement Value		
Building (\$)	Content (\$)	Total (\$)
41,562,692	22,534,750	64,097,442

A Probabilistic 100-year Return Period HAZUS-MH 3.2 analysis was run on the participating communities. HAZUS results are calculated to census blocks. This analysis utilized the best available LiDAR (COA 2012 and CAPCOG 2008) and Depth Grids. These blocks were then intersected with Uhland to run a weighted area analysis for jurisdictional results. The following paragraphs describe the results from the 100-year Return (1% Annual Chance Event) weighted area analysis.

Past flooding events in Uhland, Texas





HAZUS-MH Results

General Building Stock Damage

HAZUS estimates that about 1 building will be at least moderately damaged in Uhland. "At least moderately damaged" is defined by HAZUS as greater than 10% damage to a building. For this scenario, only residential buildings were at least moderately damaged.

Residential Buildings	Commercial Buildings	Other Buildings	Total Buildings
1	0	0	0

Building-Related Losses

Exposed Value is the total building and content values for structures within the community. The exposed value for the community is \$64,097,442. The total building related losses were \$926,000 for this scenario. This represents 1.4% of the total replacement value of the community. Loss values are divided into building and content loss dollars.

Building Loss (\$)	Content Loss (\$)	Total Loss (\$)
518,000	408,000	926,000

Essential Facility Damage

HAZUS does not estimate any critical facilities or infrastructure interruption for more than 1 day. The model estimates that 100% of community hospital beds are ready for use by patients already in the hospital and for those injured by an event.

Debris Generation

HAZUS estimates the amount of debris that will be generated in this scenario at a total of 194 tons. If the building debris tonnage is converted to an estimated number of truckloads, it will require 8 truckloads (with 1 to 25 tons per truck) to remove the building debris generated.

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS also estimates the number of people displaced that will require accommodations in temporary public shelters. The model estimates 29 people will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 3 people will seek temporary shelter in public shelters.

Floods Vulnerability Summary

According to community testimony, floods have caused great damage in the past. At one point, floodwaters washed out the Plum Creek Bridge and it cost \$379,000 to fix the bridge as part of the community cost share. South Plum Creek is known to flood for days and prevent residents from entering and exiting the community. There are 3 roads that lead out of the community including Dairy Road, Cotton Gin, and Highway 21. Structures and infrastructure are at risk for damage during severe flood events. Livestock and crops are also impacted, leading to a loss of revenue for ranch and farm owners.

If these roads are to flood, residents are unable to exit and first responders are unable to enter to respond to resident calls. When flood funding is considered, there is always a limitation to what the





community can pursue in grants because they do not have cost-share funding available to meet local match.

National Flood Insurance Program Repetitive Loss (RL)

The City of Uhland is a current participant in the National Flood Insurance Program (NFIP). As of September of 2016, the City does not have any listed RL or SRL properties according to FEMA RL/SRL data.



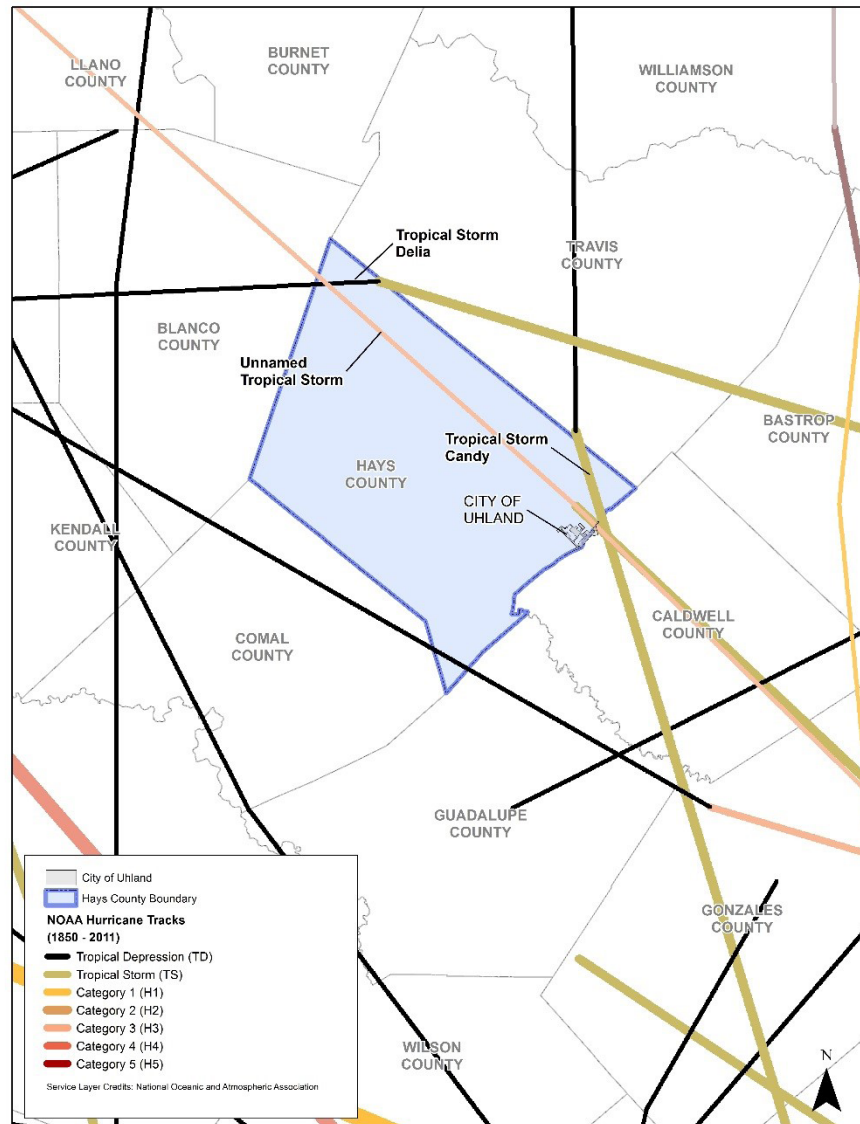


Hurricanes/Tropical Storms

Hurricanes/Tropical Storms: Location

Due to the regional nature of a hurricane or tropical storm event, the entire extent of the City of Uhland is equally exposed to a hurricane or tropical storm. Figure UH.4 illustrates the location of the planning area with historical hurricane and tropical storm paths documented by NOAA's Hurricane Tracker from 1850 to 2011.

Figure UH.4, Historical Hurricane/Tropical Storm Paths, City of Uhland



(National Oceanic and Atmospheric Administration, 2016)



Hurricanes/Tropical Storms: Previous Occurrences

Previous events are described below based on the NOAA Storm Events Database for Tropical Storm Hermine and NOAA Hurricane Tracker for all other events. By the time most hurricanes reach the County, they are tropical storms, depressions or thunderstorms. Because hurricane and tropical storm events occur on a regional scale, all events listed for Hays County have been included, as they would impact the City of Uhland.

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July 13 to July 22, 1909 – An unnamed storm made landfall near Freeport, as a Category 3 Hurricane. This storm impacted Hays County and participating communities as a tropical depression with wind speeds up to 30 knots. No significant damages, injuries, or fatalities were reported for the City.

June 22 to June 26, 1968 – Tropical Storm Candy made landfall near Port Aransas. This storm impacted Hays County and participating communities as a tropical storm with wind speeds slowing to 30 knots as a tropical depression just after leaving the County. No significant damages, injuries, or fatalities were reported for the jurisdiction.

September 1 to September 7, 1973 – Tropical Storm Delia made landfall near the border of Brazoria and Matagorda Counties. This storm impacted Hays County and participating communities as a tropical storm with wind speeds slowing to 30 knots as a tropical depression just after leaving the County. No significant damages, injuries, or fatalities were reported for the HMP update area.

September 6 to September 8, 2010 – According to the NOAA Storm Events Database, Tropical Storm Hermine made landfall near the Texas/Mexico border on the night of September 6. South Central Texas was hit very hard with widespread rains of 8 to 12 inches across much of the IH-35 corridor from Austin down to San Antonio.

Hurricanes/Tropical Storms: Extent and Probability

The Saffir-Simpson Scale measures pressure, wind speed, and storm surge in 5 categories. According to the reported previous hurricane occurrences in the jurisdiction, the maximum hurricane extent experienced was categorized as a Tropical Storm. Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of storm extents.

Based on 4 reported events in 107 years, a hurricane or tropical storm event occurs approximately every 27 years on average in Hays County. Since hurricane and tropical storm events can happen anywhere throughout the HMP update area, the City of Uhland's future probability is assumed to be similar to the surrounding County areas. In the future, the City can expect an event approximately once every 27 years on average, of up to a magnitude of a tropical storm at a 100-year Max Wind Speed of 76 mph based on historical extents and HAZUS analysis.

Hurricanes/Tropical Storms Impact

A Probabilistic 100-year Return Period HAZUS-MH 3.2 analysis was run for the City of Uhland. The following describes the results of this analysis.

HAZUS-MH Results

General Building Stock Damage

The total property damage losses were \$143,373. The majority of damage can be expected to impact residential areas (98%). The remaining damages (2%) are for commercial, industrial, agricultural and religious buildings. While some building damage is experienced, it is estimated that no buildings will be completely destroyed or experience severe damage. Exposed Value is the total building and content values for structures within the community. Loss values are divided separately for building and content loss in dollars.

Exposed Value (\$) (Building + Content)	Building Loss (\$)	Content Loss (\$)	Total Loss (\$)
64,097,442	143,373	206	143,578



Essential Facility Damage

HAZUS does not estimate any critical facilities or infrastructure interruption for more than 1 day. The model estimates that 100% of community hospital beds are ready for use by patients already in the hospital and for those injured by the hurricane.

Debris Generation

HAZUS estimates the amount of debris that will be generated by the hurricane at a total of 11 tons. Of the total amount, brick/wood comprises 100% of the total. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckload (with 1 to 25 tons per truck) to remove the building debris generated by the hurricane.

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number people displaced that will require accommodations in temporary public shelters. The model estimates no households to be displaced due to the hurricane. While there is an estimation of over \$143,000 in property damages expected, it is aforementioned that “no buildings would be completely destroyed or experience severe damage.” Residents would likely remain in their homes as damages were repaired, therefore no temporary shelter is needed.

Hurricanes/Tropical Storms: Vulnerability Summary

Similar to the impacts of windstorms, hailstorms, and lightning, Uhland can expect to be impacted with debris and possible utility interruptions of critical infrastructure, if the event is a stronger magnitude than those previously experienced by the City. In addition, the community’s proximity to IH-35 could lead to traffic delays caused by major evacuation efforts, if the highway is used as an evacuation route for coastal residents.



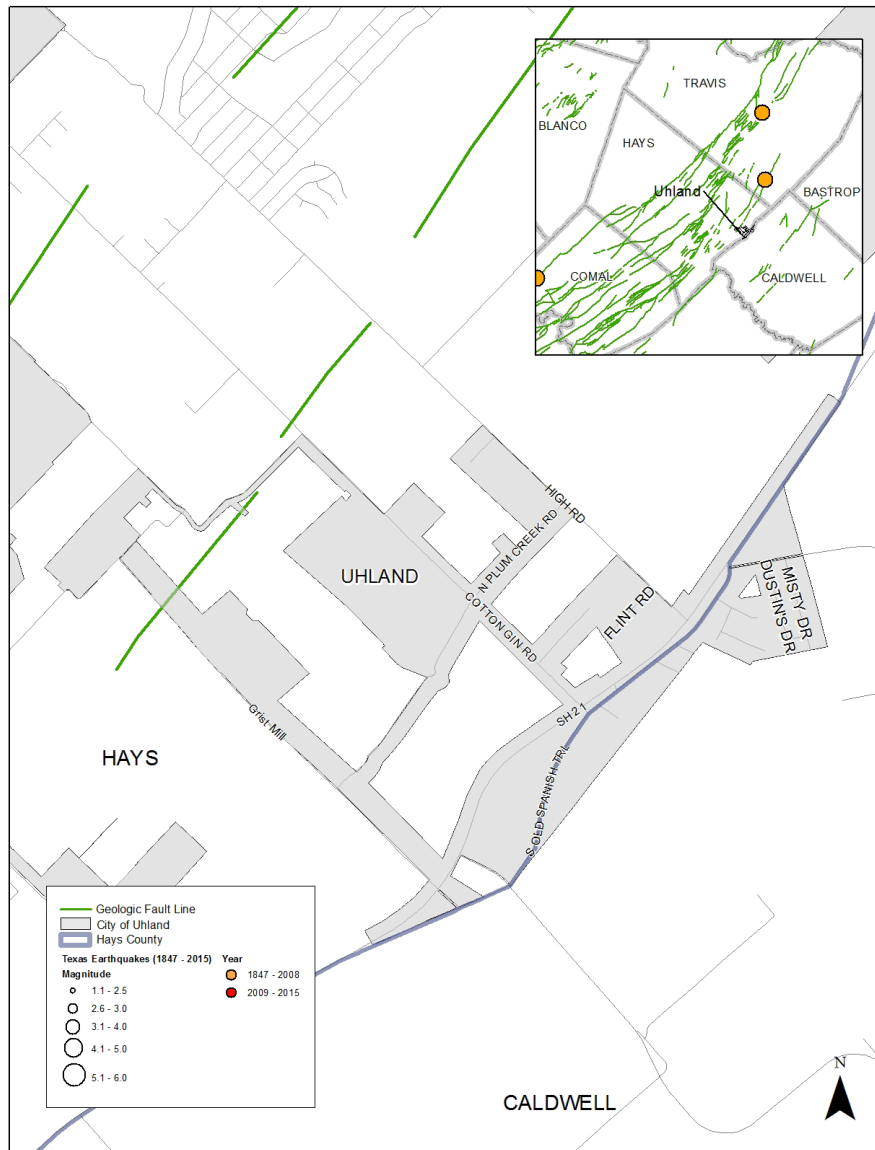
Earthquakes



Earthquakes: Location

Locations within proximity to fault lines are typically the areas most at risk for earthquakes. Figure UH.5 shows USGS documented fault lines and the locations of earthquakes from 1847 to 2015 in relation to the City of Uhland.

Figure UH.5, Texas Earthquakes, 1847 – 2015, City of Uhland



(USGS Earthquake Hazard Program, 2015)

Earthquakes: Previous Occurrences

According to USGS 1847-2015 data, there have been no documented earthquake events for the City of Uhland, as illustrated in Figure UH.5.

Earthquakes: Extent and Probability

Earthquakes are measured by Peak Ground Acceleration (PGA). The HAZUS Max PGA for the planning area is 1.59% (see Earthquakes: Impact Section for a description of the HAZUS Analysis). This corresponds to the Modified Mercalli Scale Category IV, with light perceived shaking and no potential structure damage. HAZUS measures PGA on a census tract level.



Cities within more than 1 census tract were assigned the highest PGA level to reflect the maximum possible extent. Refer to Chapter 2 for extent scale descriptions (the risk assessment portion of the main plan document).

As there have been no recorded previous occurrences of earthquakes for the City of Uhland and the PGA is less than 2% for the area, the probability of an earthquake in the City in the future is low (0 - 1 occurrences in the next 10 years, at up to a 500yr PGA of 1.59%).

Earthquakes: Impact

The FEMA How-To Guidance, Understanding Your Risks (FEMA 386-2, page 1-7), suggests the earthquake hazard should be profiled if the PGA is greater than 3%g, where PGA measures the acceleration of gravity (g). The City's PGA is less than 3%g (0.03) and there have been no recorded earthquakes in or near the jurisdiction. Therefore, only a minimum level-1 HAZUS analysis was profiled using the 500-year probability event scenario. The HAZUS analysis produced a PGA of 1.59%. HAZUS scenario would produce \$0 in building damages (Residential, Commercial, Agriculture, Religious and Government) from an event. Critical facilities and Infrastructure would not experience any loss of service. There would be no critical facilities or infrastructure that would experience moderate to complete damage. No debris would be generated from this event and no people or households would require temporary housing. There would be no moderate, extensive or completely damaged buildings by this event. HAZUS estimates no residents are expected to be displaced from their homes or will require accommodations in temporary public shelters due to the simulated earthquake. Additionally, there would be no casualties or fatalities from this event.

Earthquakes: Vulnerability Summary

While the probability of an earthquake in Uhland is low with no significant prior events on file, there is 1 fault line located within the jurisdiction according to USGS data that could cause impact if there were to be an increase in seismic activity in the area. Uhland could expect to be impacted with debris and possible utility interruptions if an event were to occur in an unlikely and unprecedented scenario exceeding the 500-year probability event scenario run in HAZUS. If an event were to incapacitate a roadway, emergency responders would be hindered from responding, leaving the residents at risk. Grist Mill Road crosses the USGS fault line displayed on Figure UH.5 within the City.



Pages 24, 25, and 26 Dam/Levee Failure have been redacted from this copy of the plan.



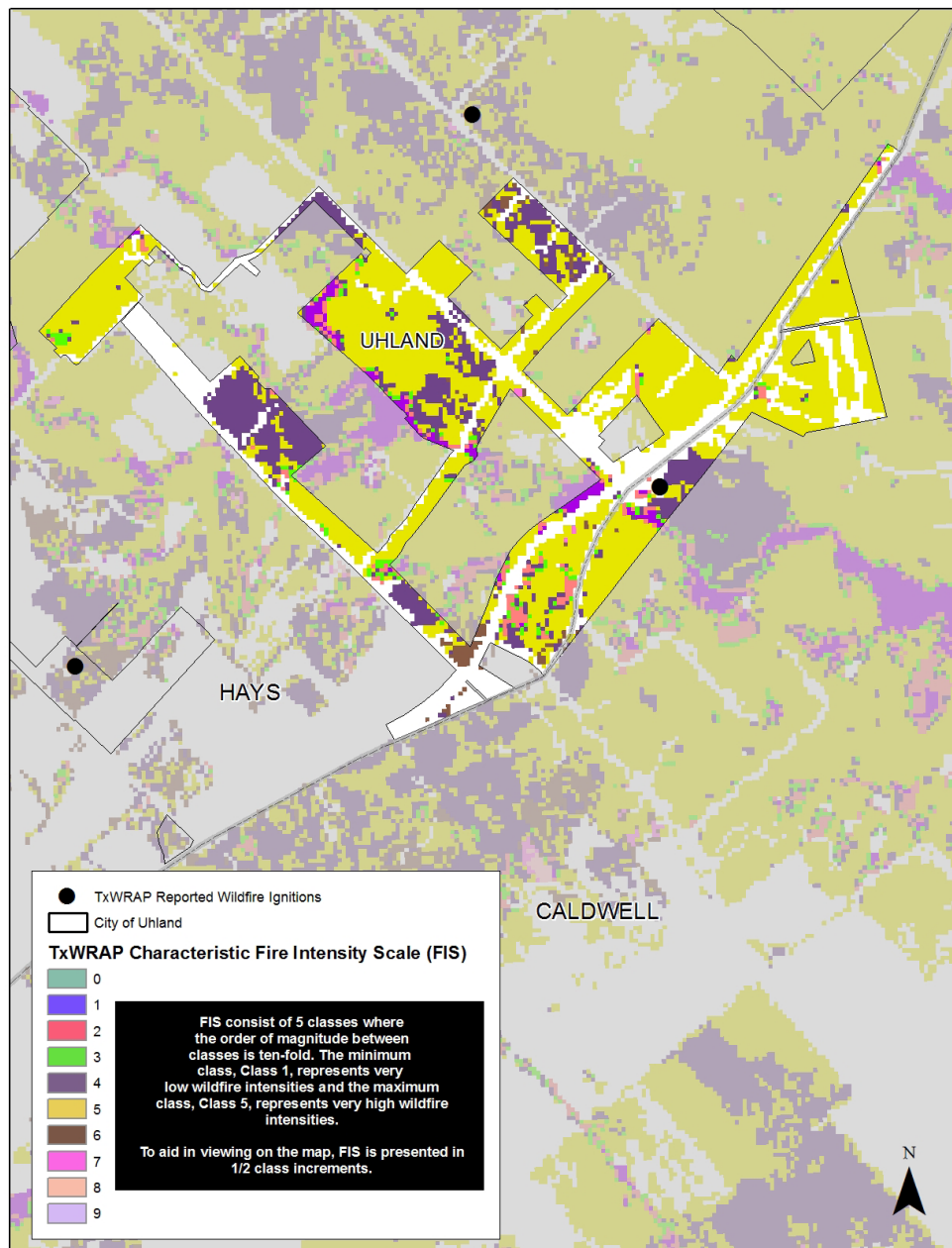


Wildfires

Wildfires: Location

Wildfires can be ignited from a variety of sources including lightning or human activity such as campfires, smoking, arson, or equipment use. The Texas A&M Forest Service's Texas Wildfire Risk Assessment Portal (TxWRAP) can be used to help communities understand their wildfire risk. Figure UH.7 below shows the location of TxWRAP's documented wildfire occurrences with Fire Intensity Scale (FIS) classifications within the City of Uhland. TxWRAP identifies FIS areas as those where wildfire fuels and associated potential dangerous fire behavior exist, based on a weighted average of 4 percentile weather categories.

Figure UH.7, Fire Intensity Scale (FIS) and Reported Wildfire Ignitions, City of Uhland



(Texas A&M Forest Service, 2016)



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Wildfires: Previous Occurrences

Table UH.9 shows the reported wildfire ignitions within the City of Uhland, according to TxWRAP and USGS Federal Fire Occurrence data from the years 1980 to 2015.

Table UH.9, Wildfire Ignitions, City of Uhland

FPA ID	Date	Fire Size (Acres)
SFO-TX02240707-86256	2/18/2007	12

Wildfire: Extent and Probability

Table UH.10 lists the Fire Intensity Acreage for the City, according to the Texas A&M Forest Service TxWRAP Community Summary Report. For a description of the FIS, refer to Chapter 2, the risk assessment portion of the main plan document.

Table UH.10, TxWRAP Fire Intensity Acreage, City of Uhland

Class	Acres	Percent
Non-Burnable	404	31.50%
1 (Very Low)	17	1.30%
1.5	38	3.00%
2 (Low)	10	0.80%
2.5	165	12.90%
3 (Moderate)	624	48.70%
3.5	21	1.70%
4 (High)	2	0.10%
4.5	0	0.00%
5 (Very High)	0	0.00%
Total	1,283	100.0 %

Based on 1 reported event in 35 years, the City of Uhland future probability for a wildfire event is approximately once every 35 years (on average) in the future, with up to a potential fire intensity of 4, or “High” classification on the TxWRAP FIS.

Wildfires: Impact

Impact on the community can be measured using TxWRAP Housing Density levels within the WUI. Areas with a higher housing and population density would be affected to a greater extent than rural areas, and especially in areas near burnable fuels. In the event of a wildfire in high density areas of population, residential structures would be damaged or destroyed, critical infrastructure such as water, sewer and electrical services would be interrupted and residents would experience injury or loss of life. Table UH.11 lists the population, percent of total population, WUI acreage and percent of WUI acreage for the City of Uhland, according to the Texas A&M Forest Service TxWRAP Community Summary Report.

Table UH.11, WUI Acreage, City of Uhland

Housing Density	WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
LT 1hs/40ac	0	0.00%	75	6.70%
1hs/40ac to 1hs/20ac	17	2.20%	122	10.90%
1hs/20ac to 1hs/10ac	43	5.50%	194	17.30%
1hs/10ac to 1hs/5ac	192	24.50%	349	31.00%
1hs/5ac to 1hs/2ac	296	37.80%	320	28.40%
1hs/2ac to 3hs/1ac	235	30.00%	64	5.70%
GT 3hs/1ac	0	0.00%	0	0.00%
Total	783	100.00%	1,124	100.00%



Wildfires: Vulnerability Summary

The City of Uhland is active against wildfire risk and takes measures to communicate burn ban information. There is vulnerability linked to the allowance of burning within the City limits. According to community testimony, 175 acres burned between Uhland and Niederwald due to a property owner losing control of a garbage fire. The presence of structures in the same vicinity of open land with vegetative fuels lends to a fast spread of burning that also creates a higher vulnerability. In addition,

the flammability of manufactured or mobile homes (90% of the residential structures in Uhland) would increase the spread and impact of a wildfire.



2.2 Risk Ranking Result

On January 12, 2017, members of the City of Uhland's completed a questionnaire as part of the Hays County HMP Update: Risk Assessment. The questions covered the risk associated with the hazards that affect each community based on the level of concern over each profiled hazard, the hazards' impact on health and safety, as well as impact to property and business continuity. The answers from this questionnaire were combined with public survey results on perception of risk. The values from both sources were analyzed using the Halff Risk Ranking Tool (details regarding the risk ranking tool are in Chapter 2, the risk assessment portion of the main plan document). The results provided a quantified ranking of risk, with values ranging from 0 to 100. The results for Uhland are shown below (hazard values shown from highest risk to lowest):

Ranking Order	Hazard	Risk Ranking Value
1	Floods	97.5
2	Expansive Soils	96.9
3	Dam/Levee Failure	95.6
4	Extreme Heat	92.5
5	Severe Winter Storms	89.7
6	Wind Storms	53.8
7	Hail Storms	53.1
8	Lightning	51.9
9	Wildfire	50.9
10	Tornadoes	50.6
11	Drought	50
12	Earthquakes	43.8
13	Hurricanes/Tropical Storms	37.5
-	Land Subsidence	Not Profiled



Section 3: Mitigation Strategy

This section examines the community's ability to perform mitigation (a review of existing capabilities is shown in Table UH.12) and identifies specific mitigation actions to address vulnerabilities for each hazard profiled in the Hays County HMP Update. The mitigation strategy is the application of actions into an approach for performing structural and non-structural mitigation efforts within the jurisdiction. Actions are also prioritized and considered for incorporation into other community programs, regulations, projects or plans.

Completed and canceled actions are also included in a separate section for future reference.

3.1 Existing Capabilities

Table UH.12, Existing Capabilities

Capability Name	Capability Type	Ability to Expand/Improve
Mayor/Emergency Management Coordinator	Elected Official	Political support and funding for mitigation actions./ Management of City-level HMP updates.
City Administrator/Floodplain Administrator	City Staff	Support for implementation of mitigation actions./ Responsibility for continued participation in the NFIP.
Engineer	Consultant	Expertise in structural mitigation projects and compliance with flood damage prevention ordinance.
Sales Tax	Funding	Provides potential funding for Hazard Mitigation items.
Property Tax		Provides potential funding for Hazard Mitigation items.
Permitting and Licensing Fees		Provides potential funding for Hazard Mitigation items.
Chapter 211 of the Local Government Code: Zoning	Authority	State-level code that authorizes the City to regulate Zoning.
Chapter 213 of the Local Government Code: Municipal Comprehensive Plans		State-level code that authorizes the City to adopt a comprehensive plan for the long-range development of the City
Chapter 214 of the Local Government Code		State-level code that authorizes the City to have regulatory authority as it related to building code (such as structural integrity and plumbing)
City of Uhland Ordinance 186	Regulation	Requires contractors to register before offering services in the City (City of Uhland, 2017)
City of Uhland Ordinance 180		Establishes Ad Valorem Tax Rate and establishes expenditure of funds to be for the City Annual Budget (City of Uhland, 2016)
City of Uhland Ordinance 126		Adopts flood damage prevention standards from Chapter 44 of Code of Federal Regulations (City of Uhland, 2012)
City of Uhland Ordinance 114		Allows for enforcement of health and sanitation standards that includes mitigation of wildfire risk through brush cleanup requirements (City of Uhland, 2011)
City of Uhland Ordinance 25		Establishes a program, including mitigation, preparedness, response and recovery phases of comprehensive emergency management (City of Uhland, 1989)
City of Uhland Ordinance 86		Ordinance adopting the 2006 International Building Codes (City of Uhland, 2009)



3.2 National Flood Insurance Program Participation

The City of Uhland participates in the NFIP and has adopted a Flood Damage Prevention Ordinance that employs a 1 foot freeboard, requiring an additional foot of elevation above the Base Flood Elevation for construction within the FEMA Flood Insurance Rate Map Special Flood Hazard Area (SFHA). This is considered a higher standard that goes beyond the minimum standards required by Chapter 44 of the Code of Federal Regulations, Section 60.3. The Ordinance names the City Administrator as the Floodplain Administrator. Technical evaluation of floodplain development permit submittals are also reviewed by the City Engineer (consultant). The City will continue to explore options for additional higher standards and consider applying to participate in the Community Rating System. The community will continue to comply with the standards of the program, with an effort to obtain Certified Floodplain Management certification for the City Administrator. The community currently has a total of 3 NFIP policies in force, as of January 2017.

3.3 Mitigation Goals

The plan-level Mitigation Goals can be found in Chapter 3, The Mitigation Strategy portion of the Hays County Hazard Mitigation Plan. These mitigation goals apply to each community and were mutually decided upon as the guiding goals for the development of actions in each planning area.

3.4 Mitigation Actions

Risk Focus is defined as:

*E= Actions reducing risk to existing buildings and infrastructure

*F= Actions reducing risk to new development and redevelopment

Number/Title	Hazard	Item Description	Implementation Agency	
1 CFM Training and CFM Certification (previously action 3 in 2011 plan, modified)	Flood	Sending designated Floodplain Administrator to floodplain management courses and to test for Certification as a Certified Floodplain Manager.	City of Uhland City Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff resources, time for training, cost of class (less than \$250), lodging/per diem costs if training is outside of County		3 months	Not started	E/F
Cost and Benefit Considerations				
The cost of floodplain management training from the Texas Water Development Board or Texas Floodplain Management Association is low and readily accessible throughout Texas. The benefits of better informing local officials on administering the flood damage prevention ordinance is critical toward responsible future growth. All owners of new development and substantial improvement to existing structures will benefit.				

Number/Title	Hazard	Item Description	Implementation Agency	
2 Emergency Communications-Weather Radios in all Public Facilities and Phone Tree/Coordination (Previously action 4 in 2011 plan, modified)	Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Floods, Hurricane/Tropical Storms, Earthquakes, Dam/Levee Failure, Wildfires	Purchase of permanent weather radio and weather station equipment for all public facilities with back-up power source. Establishment of a community phone tree to be the manual process for reaching residents for times that standard technology fails. This will supplement a plan that Uhland will coordinate with CAPCOG for utilizing available emergency communications resources available at the regional and County levels.	City of Uhland City Hall	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$500/Existing staff resources/ in-kind services		12 months	Not started	N/A
Cost and Benefit Considerations				
Low-cost coordination efforts will assist the community in reaching all of the members of the community with communication to take shelter, protective measures or evacuation procedures in the event of a disaster or disaster conditions. The benefit to protect human life is not quantifiable but should be considered justifiable.				

Number/Title	Hazard	Item Description	Implementation Agency	
3 Storm Ready Designation from National Weather Service (previously action 6 in 2011 plan)	Severe Winter Weather, Lightning, Hailstorm, Windstorm, Tornadoes, Floods, Hurricanes/ Tropical Storms	Application for designation that classifies community's level of preparedness for severe weather and storms.	City of Uhland City Hall	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		6 months	Not Started	N/A
Cost and Benefit Considerations				
There is a high level of effort to complete the application, however no other cost applies. The level of increased preparedness would benefit the entire population.				



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Number/Title	Hazard	Item Description	Implementation Agency	
4 Cooling Plan for vulnerable members of the community during periods of extreme heat that result in power loss (previously action 7 in 2011 plan, modified)	Extreme Heat	Documented plan for how to provide cool accommodations for vulnerable populations during periods of extreme heat when electrical power is interrupted.	City of Uhland City Hall	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		6 months	Not started	N/A
Cost and Benefit Considerations				
With existing staff documenting the inter-local agreements of assisting each other with accommodating their vulnerable populations, this effort would benefit the population who are either over 65 or under 16 years of age.				

Number/Title	Hazard	Item Description	Implementation Agency	
5 Promote Flood Insurance in the community (previously action 8 in 2011 plan, modified)	Floods	Placing National Flood Insurance Program information brochures in City Hall	City of Uhland City Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services, free brochures from FEMA		1 month	In progress	N/A
Cost and Benefit Considerations				
The cost and labor required to promote the NFIP is negligible. The benefit is difficult to estimate.				

Number/Title	Hazard	Item Description	Implementation Agency	
6 Increase Public Awareness of Hazard Mitigation (previously action 9 in 2011 plan)	Drought, Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Expansive Soils, Floods, Hurricane/Tropical Storms, Earthquakes, Dam/Levee Failure, Wildfires	Increasing public awareness of natural hazards and hazardous areas; distributing public awareness information regarding hazards and potential mitigation measures. Promotional sources would include City website, and public education programs. Provide link to HaysInformed on local page.	City of Uhland City Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		1 month	Not started	N/A
Cost and Benefit Considerations				
There is minimal cost and labor required to make this enhancement to the existing Uhland City website.				

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Number/Title	Hazard	Item Description	Implementation Agency	
7 Adopt wildfire maps from Hays County Firewise project (previously action 10 in 2011 plan, modified)	Wildfires	Formally adopt the maps created through the Hays County application for Firewise designation in order to begin to control development in accordance with the avoidance of hazard areas, or development with consideration of proper mitigation.	City of Uhland City Hall, in coordination with Hays County Fire Marshal's office	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		6 months	Not started	E/F
Cost and Benefit Considerations				
The benefit of mitigating against wildfire for future development as well as for instituting fire mitigation in existing areas of development greatly saves the community from the costs of potential damages.				

Number/Title	Hazard	Item Description	Implementation Agency	
8 Coordination of marketing Large Item Pick-up day for Wildfire Mitigation (previously action 11 in 2011 plan, modified)	Wildfires, Lightning, Windstorms, Tornadoes	Enhancement of existing large item pick-up to emphasize the wildfire mitigation benefits of cleaning brush and overgrown lots.	City of Uhland Administrator in coordination with waste disposal service provider	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		2 months	Ongoing	N/A
Cost and Benefit Considerations				
This slight change to marketing an existing event would likely lessen the risk for wildland fire for residents located within the WUI.				

Number/Title	Hazard	Item Description	Implementation Agency	
9 Extreme Temperature Help Hot-line (previously action 14 in 2011 plan, modified)	Extreme Heat, Severe Winter Storms	Provides residents with a phone number to call to report special needs during extreme temperatures if they do not have access to heating or cooling.	City of Uhland Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff and resources, line is already in place in City Hall		6 months	In progress	N/A
Cost and Benefit Considerations				
This line is already paid for by the City and will provide all citizens with a way to reach out and find out resources available during periods of extreme temperatures. They will also be able to report needs for assistance that are non-emergency.				



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Number/Title	Hazard	Item Description	Implementation Agency	
10 Energy Prioritization Collaboration with Electric Cooperative (previously 15 in 2011 action plan, modified)	Extreme Heat, Severe Winter Storms, Lightning, Windstorms, Tornadoes, Hurricanes/ Tropical Storms	Identification and documentation of members of the community who depend on electricity for survival (medical).	City of Uhland Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff/ in-kind services		6 months	Not started	N/A
Cost and Benefit Considerations				
This is a low cost project for prioritizing energy restoration within the community in order to accommodate the special needs community impacted by hazards that are known for affecting electrical power. All those with special needs from electrical resources would benefit.				

Number/Title	Hazard	Item Description	Implementation Agency	
11 Generator Purchase and Installation for City Hall/Community Center	Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Floods, Hurricane/ Tropical Storms, Earthquakes, Dam/ Levee Failure, Wildfires	Installation of back-up electrical power to City Hall/Community Center to ensure continuity of government operations and to also provide temporary sheltering for vulnerable populations in the City.	City of Uhland City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$8000/HMGP Grant funding with community share covered by Community Development Block Grant funding		18 months	Not started	E
Cost and Benefit Considerations				
If grant funding is eligible, the cost/benefit of this project would have to be positive. There is only 1 public building in the City in use and it has no back-up source for power.				

Number/Title	Hazard	Item Description	Implementation Agency	
12 Watershed Review Tour for Private Dams (Amended action 19 in 2011 plan)	Dam/Levee Failure, Floods	Plan for how to enforce flood damage prevention ordinance against encroachments in the floodway by inspecting for private dams that are not authorized and requirement of no-rise study when they are found to ensure neighbors are not at risk to be negatively impacted	City of Uhland Engineer	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff		6 months	Not started	E
Cost and Benefit Considerations				
This effort of enforcement will protect downstream properties and protect the community from liability from encroachments that create adverse impact. Although benefits are unquantifiable at this point, the cost is low enough for it to be negligible.				



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Number/Title	Hazard	Item Description	Implementation Agency	
13 Evacuation Plans/ Alternate road consideration (previously item 20 in 2011 plan)	Hurricanes/Tropical Storms, Floods, Dam/Levee Failure, Wildfire	Documentation of an evacuation plan that includes multiple exits for leaving the community. There are only 2 points of entry/exit and all 3 flood.	City of Uhland City Hall	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff		18 months	In progress	F
Cost and Benefit Considerations				
The cost of not establishing a way out of the community would greatly outweigh the cost of mitigating this risk of not being able to get citizens out of danger.				

Number/Title	Hazard	Item Description	Implementation Agency	
14 Water Ordinance Update/SUD Water Conservation Web page (previously action 12/20 in 2011 plan, combined)	Drought	Adopt drought stage triggers in water ordinance for preservation to provide legal enforcement capabilities as part of drought contingency planning.	City of Uhland City Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff		12 months	In Progress	N/A
Cost and Benefit Considerations				
This low cost monitoring and inclusion of drought water conservation measures in the water ordinance will take more time than money to institute and could save the community from a water shortage. All residents that use the water source would benefit. Not independently cost-effective.				

Number/Title	Hazard	Item Description	Implementation Agency	
15 Adoption of Soil Compaction Standards and Recommendations	Expansive Soils	Adopting procedures to mitigate against expansive soils when constructing future roads within the community through higher levels of soil compaction. Recommendation for higher level of soil compaction to lessen the possible effects of expansive soils to accompany existing slab requirements for manufactured and mobile homes.	City of Uhland City Hall	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing staff, cost of engineer support		6 months	Not Started	F
Cost and Benefit Considerations				
This recommendation would add a level of protection to future development of foundations so that they mitigate against expansive soil damage.				




3.5 Capabilities Assessment

Evaluation/Prioritization of Actions

Each action added to the plan was developed using the Mitigation Action Summary Worksheet shown in Figure UH.8. The cost/benefit calculation occurred on this document.

Figure UH.8, Mitigation Action Summary Worksheet



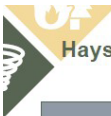
Hays County Hazard Mitigation Plan Update Process

Mitigation Action Summary Worksheet

Community Name: _____

Person completing questionnaire: _____

Mitigation Action/ Project Title	
Background/ Issue	
Opportunities for Integration	
Responsible Agency	
Partners	
Strategy for Existing Structures	



Hays County Hazard Mitigation Plan Update Process

Mitigation Action Summary Worksheet

Strategy for Future Development	
Potential Funding	
Cost Estimate (Values from "Measuring Costs" fields from Benefit and Cost Review Worksheet)	
Benefits (Statements from the "Difference" fields on the Benefit and Cost Review Worksheet)	
Timeline	
Priority (Based off Priority worksheet)	



Table UH.13, Mitigation Action Prioritization (with Hazards in order of highest priority to lowest)

Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community	Risk Ranking Score	Total Score
6. Increase Public Awareness of Hazard Mitigation	1	1	1	1	0	1	1	1	0	1	98	106
13. Evacuation Plans/Alternate road consideration	1	0	1	1	1	0	1	1	0	1	98	105
3. StormReady Designation for Uhland	1	0	1	1	0	0	1	1	0	1	98	104
2. Emergency Communications-Phone Tree Development	1	0	1	1	0	0	1	1	0	1	98	104
5. Promote Flood Insurance in the community	0	0	1	1	0	0	1	1	0	0	98	102
1. Attend Local Floodplain Management Courses to receive certification	1	1	1	0	0	0	0	1	0	0	98	102
15. Soil Compaction Recommendation	0	1	1	-1	0	0	1	1	0	0	97	100
11. Generator Purchase and Installation for City Hall/Community Center	1	0	1	1	1	0	1	1	0	1	93	100
12. Watershed Review Tour for Private Dams	1	1	1	-1	-1	1	-1	1	0	0	98	100
4. Cooling Plan for vulnerable members of the community during periods of extreme heat that result in power loss	1	0	1	0	0	0	1	1	0	1	93	98
9. Extreme Temperature Help Hot-line	1	0	1	0	0	0	1	1	0	0	93	97
11. Coordination of marketing Large Item Pick-up day for Wildfire Mitigation	1	1	1	1	1	1	-1	1	0	0	90	96
10. Energy Prioritization Collaboration with Electric Cooperative	1	0	1	0	-1	0	1	1	0	0	93	96
7. Adopt wildfire maps from Hays County Firewise project	1	1	1	1	0	1	1	1	1	1	51	60
14. Drought Monitoring Program/SUD Water Conservation Web page	1	0	1	1	0	1	1	1	0	1	50	57



Hays County Hazard Mitigation Plan, City of Uhland Annex

Mitigation Actions by Hazard

The mitigation actions in Table UH.14 are shown with the corresponding hazards.

Table UH.14, Mitigation Action Impact, City of Uhland

Action Number	Drought	Extreme Heat	Severe Winter Storms	Lightning	Hailstorms	Windstorms	Tornadoes	Expansive Soils	Floods	Land Subsidence	Hurricanes/ Tropical Storms	Earthquakes	Dam/ Levee Failure	Wildfire
1									X					
2		X	X	X	X	X	X		X		X	X	X	X
3			X	X	X	X	X		X		X			
4		X												
5									X					
6	X	X	X	X	X	X	X	X	X		X	X	X	X
7														X
8				X		X	X							X
9		X	X											
10		X	X	X		X	X				X			
11		X	X	X	X	X	X		X		X	X	X	X
12									X				X	
13									X		X		X	X
14	X													
15								X						



3.6 Integration Efforts

Table UH.15 captures ways that the HMP risk assessment, mitigation goals and actions can be integrated into other City of Uhland documents, programs and regulations.

Table UH.15, Plan Integration Efforts, City of Uhland

Name of Document	Type	Item Type	Process for Integration
Hays Inform	Program	Action	<p>Coordinate with community website administrator to link to existing Hays County HaysInformed.com emergency preparedness/awareness page when creating Public Awareness Page for hazards on Uhland website (Action 6).</p> <p>Process involves integrating hazard mitigation updates on homepage to keep the public informed.</p>
CDBG	Funding	Action	<p>Research utilizing existing CDBG funding for the cost-share for FEMA HMGP grant funding for projects (Generators- Action 11, Emergency Communications System- Action 3)</p> <p>Process involves identification of projects from Plan; obtaining Council approval to apply; notification of interest in grant to the public; completion of application for funding; if awarded, obtaining Council approval to accept; if accepted, administration of funds and implementation of project.</p>
City of Uhland Budget			<p>Seek training funds for Floodplain Administration training on future budgets through Uhland Budget Line item 21012 for training. If funding is received, apply for training through FEMA, TDEM, and TFMA.</p>
Hazard Mitigation Grant Program (HMGP)	Funding	Action	<p>Identify actions that can be funded through new and existing grant awards. Review existing mitigation actions for eligibility for the grant program, to include Benefit Cost consideration. Prepare grant application documents in advance to prepare for future grant periods.</p> <p>Process involves identification of actions from Plan; obtaining Council approval to apply; notification of interest in grant to the public; completion of application for funding; if awarded, obtaining Council approval to accept; if accepted, administration of funds and implementation of project.</p>
Pre-Disaster Mitigation (PDM)			
Flood Mitigation Assistance (FMA)			
TWDB Flood Protection Planning (FPP) Grant			



Table UH.15, Plan Integration Efforts, City of Uhland

Name of Document	Type	Item Type	Process for Integration
TWDB Clean Water State Revolving Fund (CWSRF)	Funding	Action	Identify actions that can be funded through new and existing loans. Review existing mitigation actions for eligibility for the loan program, to include Benefit Cost consideration. Prepare loan application documents in advance to prepare for future application periods.
Texas Water Development Fund (DFund)			Process involves obtaining Council approval to apply; notification of interest in loan to the public; completion of application for loan; if awarded, obtaining Council approval to accept; if accepted, administration of funds and implementation of project.

Incorporation Achievements Since Previous Plan Update

The City of Uhland incorporated the HMP into other planning mechanisms as a demonstration of progress in local hazard mitigation efforts. This was achieved by identifying MPC planners and or stakeholders to participate in planing and zoning activities.



Section 4: Finalize Plan Update (Review, Evaluation, and Implementation)

4.1 Changes in Development

The City of Uhland has experienced growth in small industry in the last 3 years. Most significantly, their tax revenue has increased with the addition of a concrete plant within the city limits. This in combination with other commercial growth, has increased the budget for the community in the recent years. During the next planning period, the community expects to see more subdivision growth and even more commercial growth. This higher concentration of population can increase vulnerability to natural hazards.

The City's first convenience store is currently under construction, Mio Rancho Meat Market. In addition, Hays CISD broke ground on Elementary School #14 on June 1, 2017. This is located on High Road, on the northwest side of Uhland. Hays CISD Transportation Department will also be building a Transportation Department building to house the district's buses in Uhland. Built with the latest of building standards, these structures are less vulnerable to natural hazards than older structures in the City.

4.2 Progress in Mitigation Efforts

Past Mitigation Action Progress Reports Summary - Completed and Canceled

2011 Action Number	Hazard	Item Description	Lead Department
1	Flood	Increase the number of Hays County communities that participate in the NFIP	City of Uhland
Cost Estimate/Funding		Schedule	Status as of 2017
Cost and Funding: Existing staff resources, no cost		Completed	Completed
Cost Effectiveness			
Not independently cost-effective			

2011 Action Number	Hazard	Item Description	Lead Department
2	Flood	Adopt Higher Standard Flood Damage Prevention Ordinance	City of Uhland
Cost Estimate/Funding		Schedule	Status as of 2017
Cost and Funding: Existing staff resources, no cost		Completed	Completed
Cost Effectiveness			
Not independently cost-effective			

2011 Action Number	Hazard	Item Description	Lead Department
5	All hazards	Development of and maintenance of Countywide and individual community HAZMAP Plans	City of Uhland
Cost Estimate/Funding		Schedule	Status as of 2017
Existing staff resources		Original Plan adopted on 4/20/2004. Update in 2011	Completed
Cost Effectiveness			
Not independently cost-effective			



Hays County Hazard Mitigation Plan, City of Uhland Annex

2011 Action Number	Hazard	Item Description	Lead Department
13	Drought	Public Information Campaigns	City of Uhland
Cost Estimate/Funding		Schedule	Status as of 2017
No additional cost- uses existing staff resources		Ongoing	Canceled. Replaced by Action 14.
Cost Effectiveness			
Very difficult to determine, but presumed very cost-effective because actions preserve essential function			

2011 Action Number	Hazard	Item Description	Lead Department
18	Floods, Thunderstorms, high winds, tornadoes, seismic	Structural/Engineering Study of Uhland public facilities	City of Uhland
Cost Estimate/Funding		Schedule	Status as of 2017
To be determined, but if initiated probably from General Fund		Not yet established- to be commenced only if funding is available	Canceled. This action is not fiscally feasible.
Cost Effectiveness			
Not independently cost-effective, but the initial step in identifying appropriate mitigation actions			

4.3 Changes in Priorities

Plan-level priority changes are reflected in the changes to the plan-level goals shown in Chapter 3: Mitigation Strategy within the Main Plan document. The current City of Uhland Administrator has become very active and successful in acquiring grant funding for improvements to the City. With these funds, the community has been able to make improvements to infrastructure and public facilities. Continuing the pursuit of grant funding will benefit the community. The timing of the newly updated Hazard Mitigation Plan and the to apply for mitigation grant funds will become a renewed priority for Uhland.



Section 5: Approval and Adoption

5.1 Approval and Adoption Procedure

The procedures for approval and adoption are described in Chapter 4.1 of the main plan document.

Table UH.16, Municipal Jurisdiction Adoption Date

Municipality	APA Date	Adoption Date
City of Uhland		

Approval and Adoption





Jurisdiction Adoption Documentation Placeholder

References

- City of Uhland. (1989, 04 05). Government/Ordinances. Retrieved from Ordinance 25- Emergency Management: <http://www.cityofuhland.com/wp-content/uploads/2015/12/25-Emergency-management-89.pdf>
- City of Uhland. (2009, 01 01). Government/Ordinances. Retrieved from Ordinance 86- Adoption of International Building Codes: http://www.cityofuhland.com/wp-content/uploads/2015/12/Building_Codes.pdf
- City of Uhland. (2011, 04). Government/Ordinances. Retrieved from Ordinance 114- Health and Sanitation: <http://www.cityofuhland.com/wp-content/uploads/2015/12/Ord.-114-Health-and-Sanitation.pdf>
- City of Uhland. (2012, 05 16). Government/Ordinances. Retrieved from Ordinance 126-Flood Damage Prevention Ordinance: <http://www.cityofuhland.com/wp-content/uploads/2015/12/126-Flood-Damage-Prevention-Ordinance.pdf>
- City of Uhland. (2016, 09 07). Government/Ordinances. Retrieved from Ordinance 180- Ad Valorem Tax: <http://www.cityofuhland.com/wp-content/uploads/2016/09/Ordinance-180-2016-2017-Tax-rate.pdf>
- City of Uhland. (2017, 03 24). Applications/Permits. Retrieved from Residential Building Permit Application: <http://www.cityofuhland.com/wp-content/uploads/2015/12/RESIDENTIAL-BUILDING-PERMIT-APPLICATION102015.pdf>
- City of Uhland. (2017, 02 01). Government/Ordinances. Retrieved from Ordinance 186- Contractor Registration: <http://www.cityofuhland.com/wp-content/uploads/2017/02/Ordinance-186-Contractor-Registration.pdf>
- National Fire Protection Association. (2013, June). NFPA News & Research. Retrieved from Lightning Fires and Lightning Strikes: <http://www.nfpa.org/news-and-research/fire-statistics-and-reports/fire-statistics/fire-causes/lightning-fires-and-lightning-strikes>
- National Highway Traffic Safety Administration. (2017, 03 11). Traffic Safety Facts. Retrieved from Texas 2011-2015: <https://cdan.nhtsa.gov/SASStoredProcess/guest>
- National Oceanic and Atmospheric Administration. (2016). Historical Hurricane Tracks. Retrieved from National Oceanic and Atmospheric Administration Coastal Management: <https://coast.noaa.gov/hurricanes/>
- National Oceanic and Atmospheric Administration Storm Event Database. (2016, 12 01). National Centers for Environmental Information. Retrieved from Data Access: <https://www.ncdc.noaa.gov/data-access>
- Southwest Engineers. (2016, 09 26). City of Uhland Zoning Map. Retrieved from Uhland Zoning Map: <http://www.cityofuhland.com/wp-content/uploads/2017/02/Uhland-Zoning-Map-092616.pdf>
- Texas A&M Forest Service. (2016, 12 01). Wildfire Risk Assessment Portal. Retrieved from Public Viewer: <https://www.texaswildfirerisk.com/>
- Texas Department of Transportation. (2017, 03 11). Crash Records Information System. Retrieved from C.R.I.S Query: <https://cris.dot.state.tx.us/public/Query/#/public/welcome>
- Texas Natural Resources Information System. (2011). TNRIIS Data Catalog Low Water Crossings. Retrieved from TNRIIS: <https://tnris.org/data-catalog>
- Tornado Facts. (2016, 03 16). Tornado Facts and Information . Retrieved from Tornado Scale: <http://www.tornadofacts.net/tornado-scale.php>
- USGS Earthquake Hazard Program. (2015). USGS Earthquake Hazard Program. Retrieved from USGS: <https://earthquake.usgs.gov/data/>

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City of Wimberley
Hays County Hazard
Mitigation Plan Update
2018



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City of Wimberley Annex

Section 1: Organize and Review

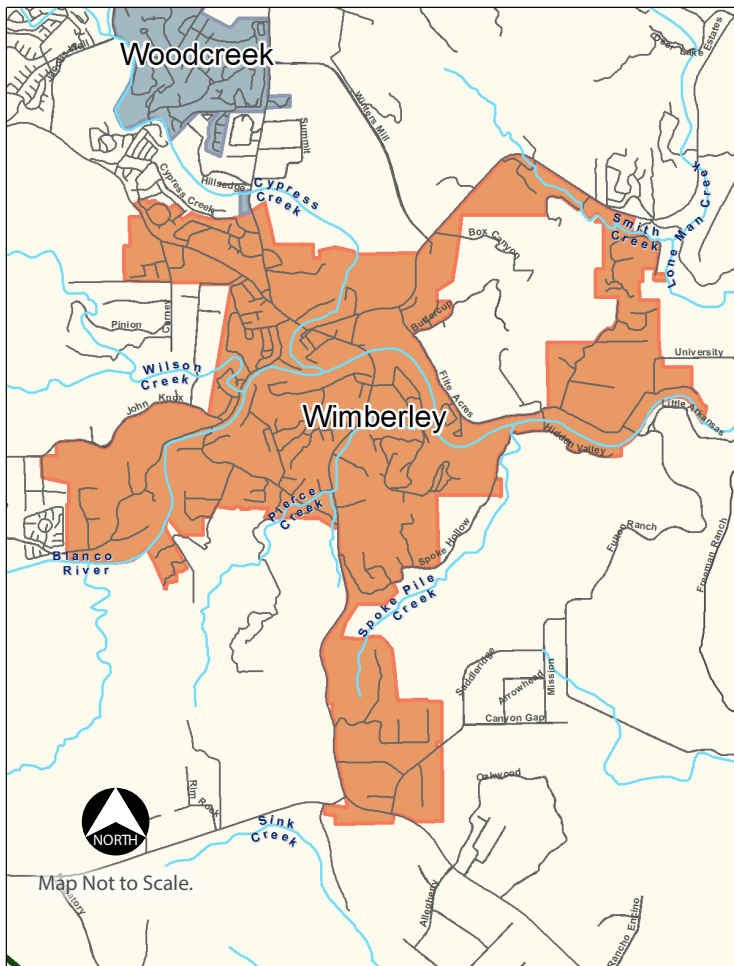
This section contains a brief description of the City of Wimberley and its jurisdictional features. In addition, Section 1 contains the following details regarding Wimberley's:

- participation in the Hays County HMP Update process,
- stakeholder engagement,
- public outreach strategy,
- incorporation efforts and
- plan maintenance procedures.

*Population :	2,620
Size of Community:	9 sq. miles
*Population over 65 years old	703
*Population under 16 years old	444
*Economically Disadvantaged Population (\$0-\$20k)	164
Wimberley is serviced by the following responders:	
EMS - Wimberley EMS / ESD #7	
Fire/EMS - Wimberley Fire Rescue/Wimberley EMS	
Law Enforcement - Hays County Sheriff's Office	

**HAZUS-MH 3.2 updated Census 2010 Population Estimates*

Figure WB.1, City of Wimberley Planning Area



1.1 Community Description

When planning, it is important to take into account the characteristics that make a community unique. Consideration of unique needs when it comes to mitigating or recovering from natural hazards ensures that all members of the community and their needs are addressed.

The City of Wimberley is in Central Hays County at the confluence of Cypress Creek and the Blanco River. It is situated roughly 1,000 feet above sea level on the Edwards Plateau and is considered the heart of the Texas Hill Country. Wimberley is a tourist destination, known for its quiet secluded lodging, art, music, theater, quaint downtown with diverse shops, river and creeks, camps and retreats, and its frequent festivities. Home to the popular Blue Hole Regional Park, the 126-acre park is one of the only parks in the country that is fully sustainable. It was built with natural materials that were cleared to create the park space. Fencing was constructed from cleared trees and micro-detention facilities are used to collect the water used for the facilities. Because of attractive natural features, Wimberley has an large number of tourists during the warm season.

Hays County Hazard Mitigation Plan, City of Wimberley Annex

Wimberley is distinct in the fact that they have invested in insuring their roads and bridges. During recent Federal declared disasters that destroyed infrastructure, this coverage was used to repair these assets without any need for FEMA funding.

The City's students are served by Wimberley Independent School District (ISD), which is made up of 4 schools that also act as a major employer for the community (shown in Table WB.1). The community does not collect ad valorem (property) tax, from Wimberley land owners. The \$1 million general fund that supports their government operations is generated from sales tax revenue brought in by the community attractions.

Incorporated in May of 2000, Wimberley previously existed as a census-designated place (CDP). The community is governed by a Mayor and 3 council members and is supported by 8 City staff and many volunteers. Wimberley's main utility providers are shown in Table WB.2.

Table WB.1, Major Employers

Business Type	Name of Employer
Education	Wimberley Independent School District

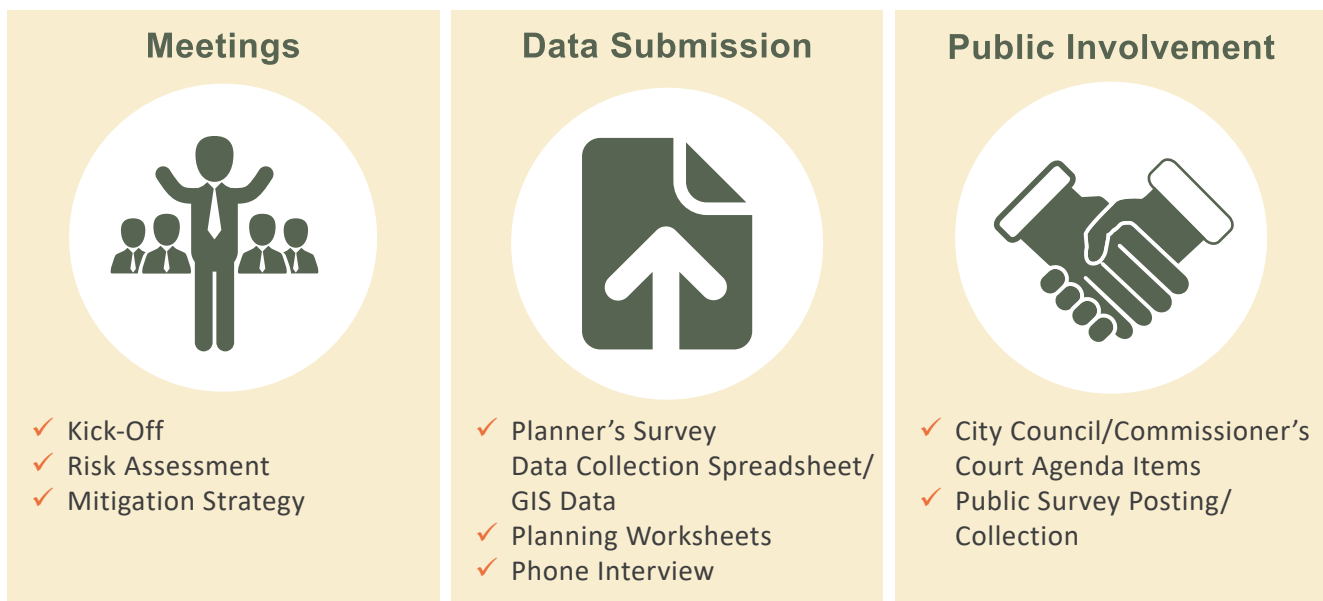
Table WB.2, Utility Providers

Type	Provider
Electric	Pedernales Electric Cooperative (PEC)
Water	Wimberley Water Supply Corporation/Aqua Texas

Community Planning Involvement

MPC planning activities for the Hays County Hazard Mitigation Plan (HMP) Update are captured in Figure WB.2, which utilizes check-marks to indicate each of the activities that were completed by Wimberley MPC members.

Figure WB.2, City of Wimberley Plan Participation





1.2 Outreach Strategy

The City of Wimberley was very active in the following outreach activities used to request public participation in the Hays County HMP Update. Their activities included promotion of the HMP Public Survey, a City Council announcement, plan phase newsletter distribution and a draft plan public comment period.

Public Survey Promotion

Wimberley advertised the Hays County Hazard Mitigation Plan Update Public Survey on the homepage of www.cityofwimberley.com.

As of March 10, 2017, Wimberley had 10 residents respond to the public survey. Details on how the survey data was directly incorporated into the Risk Ranking process for hazards is included in Chapter 2, the risk assessment portion of the main plan document.

City Council Meeting Announcement

On January 5, 2017, the City Administrator presented information on the Hays County Hazard Mitigation Plan Update to the Wimberley City Council. Elected officials, local agency leaders and members of the public attended the meeting. The Council minutes for this presentation are included in Plan Appendix A.

Plan Phase Newsletters

Wimberley was provided with newsletters at each phase of the planning process in order to be able to share updates on the planning process with stakeholders, elected officials, City staff and the public. Copies of the newsletters can be found in Plan Appendix A.

Plan Draft Public Review and Comment Period

The link to the draft Hays County HMP (hosted on the Hays County Office of Emergency Services page) was posted on the City of Wimberley website from July 12, 2017 until July 26, 2017. A hard copy was placed in the Wimberley City Hall for public review. No public comments were received during this review period.



1.3 Incorporation of Sources

In addition to stakeholder and public input, the MPC also reviewed other City planning resources that could provide useful information for the plan update process. Table WB.3 lists the documents reviewed and how they were considered for incorporation in the updated plan.

Table WB.3, Review/Incorporation of Sources

Name of Document	Type	How Incorporated
2013 State of Texas Hazard Mitigation Plan	Plan	Utilized hazard definitions and hazard classification names.
Flood Insurance Study	Study	Incorporated best available hydraulic and hydrologic study results for flood hazard profile.
Code Chapter 151 Building Regulations; Construction Ordinance	Regulations	Reviewed for possible enhancement with mitigation (American Legal Publishing Corporation, 2001).
Code Chapter 35 Fee Schedule Ordinance	Regulations	Reviewed for floodplain development fees (none found) (American Legal Publishing , 2000).
Code Chapter 32 Emergency Management Ordinance	Regulations	Reviewed for consideration of incorporation of mitigation items <ul style="list-style-type: none"> Inclusion of part indicating that “a Hazard Mitigation Plan shall be maintained.” This ordinance currently states this for the Emergency Management Plan, but not the Mitigation Plan. (American Legal Publishing Corporation, 2003).
Code Chapter 153 Flood Damage Prevention Ordinance	Regulations	Reviewed for consideration of higher standards to development, such as freeboard on lowest finished floor (American Legal Publishing Corporation, 2001).
Code Chapter 92 Open Burning Ordinance	Regulations	Reviewed for wildfire mitigation enhancement opportunities (American Legal Publishing Corporation, 2005).
Code Chapter 154 Subdivision Control Ordinance	Regulations	Reviewed for opportunities to add accessibility requirements that will decrease the amount of ingress and egress issues with subdivisions within the community (American Legal Publishing Corporation, 2001).
City of Wimberley Residential Application for Development	Form	Reviewed for inclusion of floodplain review during application process. The form includes the requirement for elevation certificates if in the Special Flood Hazard Area. (City of Wimberley, 2017).

Hays County Hazard Mitigation Plan, City of Wimberley Annex

Table WB.3, Review/Incorporation of Sources, (cont.)

Name of Document	Type	How Incorporated
2016 Comprehensive Plan	Plan	<p>Draw from existing plan Goals and Objectives</p> <ul style="list-style-type: none"> Community Character-Visual Environment 1- promote the use of planting to enhance the visual quality of the community, provide shade and control erosion (flood) Community Character-Visual Environment 4a- Regulate overhead utility lines (lightning, windstorm, severe winter weather, tornado) Natural Environment- Water Quality/Conservation 1a- The City should encourage rainwater collection systems for new construction and encourage retrofitting existing structures (drought) Natural Environment- Water Quality/Conservation 1b- The City should initiate programs to educate the public and encourage water conservation in both residential and commercial use (drought) Natural Environment- Water Quality/Conservation 2- Water reuse to allow for safe reuse of water, for the City to reuse water whenever possible and promote educational programs which explain the safe reuse of water in residential and commercial applications (drought) Natural Environment- Wildlife/Vegetation 1c- the City should encourage implementation of conservation easements and similar conservation tools (flood) City Infrastructure- Public Health/Safety 1- Develop and maintain an Emergency Preparedness Plan for the City, as a supplement to the Hays County Emergency Plan, to protect and assist residents and visitors in the event of disasters...(all hazards except expansive soils) City Infrastructure- Public Health/Safety 1a- The City should maintain a process regarding early warning, early road closures, evacuation and alternate route designation. City Infrastructure- Public Health/Safety 1b- The City should maintain a process to secure County, State, Federal and charitable disaster relief funds. (all hazards) City Infrastructure- Public Health/Safety 1c- The City should maintain an emergency shelter plan for residents and visitors in need of an equipped shelter in the event of emergency or disaster (all severe weather hazards and wildfire) City Infrastructure- Public Health/Safety 3- Develop a long-range plan for fire protection (wildfire) City Infrastructure- Roads/Transportation 1- Maintain a comprehensive transportation master plan addressing safety, congestion and effective routes for emergency vehicles (flood, wildfire, dam/levee failure) City Infrastructure- Water/Wastewater Systems 1- Ensure a safe, adequate and reliable water supply for current and future residents (drought) City Infrastructure- Storm Water and Flood Control 1a-...require that construction in areas adjacent to waterways and flood zones be sited and build in accordance with rules that are no less stringent than those required for compliance with FEMA mandates (flood) City Infrastructure- Storm Water and Flood Control 1b-...protect quality of watersheds and limit amount of impervious cover City Infrastructure- Storm Water and Flood Control 2a-...develop a watershed protection plan and master drainage plan (flood) City Infrastructure- Storm Water and Flood Control 2d- ...encourage landscaping to prevent erosion (flood) Built Environment-Growth Management 1a-...maintain appropriate zoning and subdivision ordinances Built Environment-Growth Management 1b-...maintain building codes to assure proper quality and safety (severe weather hazards) Built Environment-Growth Management 3a-...consider water availability in granting new building permits (drought) Built Environment-Special Areas 3- ...preserve and protect the lands adjoining the significant waterways in the City (flood, drought) <p>(City of Wimberley, 2016)</p>



Hays County Hazard Mitigation Plan, City of Wimberley Annex

Table WB.3, Review/Incorporation of Sources , (cont.)

Name of Document	Type	How Incorporated
Economic Development Strategy	Plan	Reviewed for items to incorporate <ul style="list-style-type: none"> • Water and Wastewater objective- provide guidelines for water use (drought) (City of Wimberley, 2008)
Parks Master Plan	Plan	Reviewed incorporation strategy for mitigation items <ul style="list-style-type: none"> • Priority No. 5- Acquire additional property along waterways for protection as open space and for use as park land (flood) (City of Wimberley, 2008)
Transportation Master Plan	Plan	Review for actions that would support mitigation <ul style="list-style-type: none"> • Component B- Thoroughfare Plan- new proposed connections that will provide for much faster emergency response • Component C- Emergency Access Plan- <ul style="list-style-type: none"> o Correcting blockages, such as raising low water crossings....construction of higher roadbeds, bridges, larger culverts etc. Redesigns will be based on heights that would allow no overtop for a 25-year flood and a maximum 6 inch overtop for a 100-year flood. o Creating alternate access routes o Negotiations between private property owners or POAs and the City to establish a standardized, permanent procedure for allowing access for citizens and emergency vehicles during designated events Incorporation of problem areas <ul style="list-style-type: none"> • Emergency Access problem areas identified for inclusion in Flood Vulnerability Statements (in Risk Assessment Section 2) (City of Wimberley, 2007)





Section 2: Risk Assessment

City of Wimberley Jurisdictional Hazards

This section contains Wimberley's hazard profiles for each natural hazard included in the Hays County HMP Update. Profiles include:

- Location - the area where the hazard is known to occur
- Previous Occurrences - a history of reported events for the hazard
- Significant Previous Occurrences (when applicable) - notable hazard events within the community
- Extent - the strength or magnitude of the hazard
- Probability - the likelihood of the hazard event occurring in the future
- Impact - the consequence or effect (or possible effect) of hazard events
- Vulnerability Summary - identification of structures, systems, populations or assets susceptible to loss or damage

Hazard descriptions and extent scales for hazard magnitudes, are found in Chapter 2, the risk assessment portion of the main plan document.

When available, data specific to Wimberley was used for hazard analysis. When no instances were reported specifically for the jurisdiction for regional hazards, County-wide data was applied.

State and national datasets were used to determine occurrence, extent, and the respective probabilities, rather than verbal testimonies, in an effort to retain data consistency. For some hazards, the National Oceanic and Atmospheric Administration (NOAA) Storm Events Database was used as the most comprehensive data available for hazards. The Storm Events Database does not always reflect the most recent totals for fatality, injury and damage amounts shown for previous hazard occurrences. The Previous Occurrences paragraphs identify instances in which this may occur. Verbal testimony, when available, was integrated into impact or vulnerability summaries to account for updates in this data.

2.1 Hazard Profiles

Hazards profiled within the Risk Assessment include:

- Drought - Within Chapter 2, the risk assessment portion of the main plan document.
- Extreme Heat - Within Chapter 2, the risk assessment portion of the main plan document.
- Severe Winter Storms - Within Chapter 2, the risk assessment portion of the main plan document.
- Lightning - Within Chapter 2, the risk assessment portion of the main plan document.
- Hailstorms
- Windstorms
- Tornadoes
- Expansive Soils
- Floods
- Hurricanes/Tropical Storms
- Earthquakes
- Dam/Levee Failure
- Wildfires

Hailstorms



Hailstorms: Location

The entire extent of the City of Wimberley is exposed to some degree of hail hazard. Since hail can occur at any location, hail events could be experienced anywhere within the planning area.

Hailstorms: Previous Occurrences

According to the NOAA Storm Events Database, there were 21 documented hail events listed for the City of Wimberley and 57 documented events listed for Hays County and its unincorporated jurisdictions from year 1967. While the NOAA Storm Events Database lists events since 1967 for the County, events were not documented per jurisdiction until 1993.

Hailstorms: Extent and Probability

The Tornado and Storm Research Organization (TORRO) created a hail extent index to measure hail called the Hailstorm Intensity Scale. According to the reported previous hail occurrences for the planning area, the maximum hail extent experienced was up to 1.75 in., or 44.45 mm. in diameter. This size corresponds to a TORRO Hailstorm Intensity Scale classification of “Destructive.” Refer to Chapter 2, the risk assessment portion of the main plan document, for hail extent scale descriptions.

Based on 21 reported events in 23 years, the City of Wimberley’s probability for a hail event is approximately once every year (on average) in the future, with hail up to 1.75 in., or 44.45 mm. in diameter, corresponding to a TORRO Hailstorm Intensity Scale classification of “Destructive.”

Hailstorms: Impact

Potential impacts can be determined based on the maximum hail extent experienced (44.45 mm), where the TORRO Hailstorm Intensity Scale indicates that impact can be expected to include any of the following:

- Varying degrees of damage to vegetation and crops
- Damage to plastic structures
- Varying degrees of damage to glass
- Paint and wood scored
- Vehicle bodywork damage
- Varying degrees of roof damage
- Varying degrees of risk of injuries
- Varying degrees of aircraft damage
- Brick walls pitted

Hailstorms: Vulnerability Summary

According to community testimony, there was a hail event in 2014 from which there is still an effort to recover from 6-inch hail that knocked holes in residential roofs and stripped community trees. The event caused significant damage to homes and left debris in the roadways. Roadway debris resulted from damage to the abundance of trees located within Wimberley, knocking down branches and leaves that left blockages up to 4 inches high on the City streets. Roadway debris can create difficulty for emergency responders attempting to reach distress calls, as well as inhibit residents from travel access to stores, hospitals, work or schools.





Windstorms

Windstorms: Location

The entire extent of the City of Wimberley is exposed to some degree of wind hazard. Since wind can occur at any location, wind events could be experienced anywhere within the planning area.

Windstorms: Previous Occurrences

According to the NOAA Storm Events Database, there were 4 documented wind events listed for the City of Wimberley and 38 documented events listed for Hays County and its unincorporated jurisdictions from year 1974. While the database lists events since 1974 for the County, events were not documented per jurisdiction until 1994.

Windstorms: Extent and Probability

Wind is measured by the Beaufort Wind Scale that relates wind speed to observed conditions on land and sea. According to the reported previous windstorm occurrences in the planning area, the maximum wind extent experienced was 52 knots (corresponding to Beaufort Wind Scale Classification: Storm). Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of wind extent scales.

Based on 4 reported events in 22 years, the City of Wimberley's future probability for a wind event of up to 52 knots (Beaufort Wind Scale Classification: Storm) is approximately once every 5 to 6 years (on average) .

Windstorms: Impact

Data available from the Texas Department of Transportation's Crash Records Information System shows that between the years of 2010 and 2017, rural Hays County experienced 5 crashes related to severe crosswind weather conditions. There were no injuries reported from these crash events (see Table WB.4). Since wind events occur on a regional scale, it is assumed that weather related crashes in the surrounding County area would be similar to those experienced in these conditions within Wimberley.

Table WB.4, Windstorms, Vehicle Accidents, Hays County

City	Fatality	Incapacitating Injury	Non-Incapacitating Injury	Possible Injury	Crash Year	Street Name	Surface Condition	Weather Condition
Rural Hays County	0	0	0	0	2010	LIME KILN RD	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2017	US0290	Wet	Severe Crosswinds

(Texas Department of Transportation, 2017)





Structures can be damaged by flying debris and impact from winds, damaging rooftops and causing other structural damage. Manufactured homes are especially vulnerable to damage that high winds can cause, to include destruction in the most extreme event conditions.

Critical infrastructure, such as utility poles and street signals, could also be disrupted, impacting all residents in the affected area. Debris on the roadway can also cause obstruction for emergency responders' ability to provide services.

Windstorms: Vulnerability Summary

Wimberley has previously experienced debris accumulation on roadways during past windstorm events. Such incidents could cause impact on the ability of public safety officials to respond to emergency calls. Additionally, there have been local incidents where fallen trees have blocked ingress and egress to communities, restricting travel into and out of the neighborhoods.

The community has many power lines surround by trees that have not been adequately trimmed. This could leave residents at risk for a power outage resulting from tree falling on the line.

There are many sites of critical facilities and infrastructure that are located within the City and are not retrofitted to mitigate damages from extreme wind events. These facilities include: Wimberley Community Center, Wimberley Volunteer Fire Department, Wimberley EMS, and Wimberley City Hall. Damages sustained by an extreme wind event to these facilities could hinder the ability to provide crucial services needed by the community.





Tornadoes

Tornadoes: Location

The entire extent of the City of Wimberley is exposed to some degree of tornado hazard. Since tornadoes can occur at any location, tornado events can be experienced anywhere within the planning area.

Tornadoes: Previous Occurrences

According to the NOAA Storm Events Database, there were 4 documented tornado events listed for the City of Wimberley and 16 documented events listed for Hays County since year 1953. While the database lists events since 1953 for the County, events were not documented per jurisdiction until 1997. The tornado events reported for the City of Wimberley are listed in Table WB.5.

Fatality, injury and damage amounts are shown in Table WB.5, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table WB.5, Tornado Events, City of Wimberley

Location	Date	Type	Magnitude (mm)	Fatalities	Injuries	Property Damage	Crop Damage
Wimberley	4/8/1998	Tornado	F0	0	0	0	0
Wimberley	4/8/1998	Tornado	F0	0	0	0	0
Wimberley	11/15/2001	Tornado	F0	0	0	50,000	0
Wimberley	3/30/2007	Tornado	EF0	0	0	0	0
Total				0	0	\$50,000.00	\$0.00

(National Oceanic and Atmospheric Administration, 2016)

Tornadoes: Extent and Probability

Tornadoes are measured by severity on the Fujita and Enhanced Fujita Scales, with a range from 0-6. According to the reported previous tornado occurrences in the jurisdiction, the maximum tornado extent experienced was a category EF0. Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of tornado extent scales, Fujita (F) Scale and Operational Enhanced Fujita (EF) Scale.

Based on 4 reported events in 19 years, a tornado event occurs approximately once every 4 to 5 years on average, in the future, with up to an EF0 magnitude.

Tornadoes: Impact

The wind speeds and debris caused by tornadoes can impact all residents in the community. The City of Wimberley has experienced tornadoes at F0 levels in the past. If similar events were to happen in the future in the City, the type of impacts that the planning area could expect associated with that magnitude would include:

- Light Damage - Broken branches; shallow rooted trees pushed over; some chimney damage. (Tornado Facts, 2016)

Structures can be damaged by flying debris and impact from winds, damaging rooftops and causing other structural damage. Manufactured homes are especially vulnerable to damage that high winds can cause, to include destruction in the most extreme event conditions.





Critical infrastructure, such as utility poles and street signals, could also be disrupted, impacting all residents in the affected area. Debris on the roadway can also cause obstruction for emergency responders' ability to provide services.

Tornadoes: Vulnerability Summary

Due to the fact that tourism is so popular in the City of Wimberley, there is a great concern for tourists visiting Wimberley attractions, such as the large Blue Hole Park. There are no Outdoor Warning Sirens in the community, or anywhere else in Hays County. As the intent of sirens are to encourage people outdoors to seek cover from dangerous weather conditions, the implementation of a siren at the park could lessen visitor vulnerability. There is a reverse-911 emergency notification system in place, however it requires registration in order to receive the emergency alerts.

There is a small population of mobile homes in the community and those would be more vulnerable to the high winds associated with a tornado than site-built homes. There is an additional concern for the availability of electrical infrastructure, due to the lack of redundancy in the transmission and distribution system for power. There is not currently a shelter plan in place for those seeking safety from a tornado.

Wimberley has previously experienced debris accumulation on roadways during past windstorm events. Such incidents could impede the ability of public safety officials to respond to emergency calls. Additionally, there have been local incidences where fallen trees have blocked ingress and egress to communities disrupting travel into and out of their neighborhoods. This displays vulnerabilities as high winds and debris also accompany tornado events.

The community has many power lines surrounded by trees that have not been adequately trimmed. This could leave residents at risk for a power outage resulting from a tree falling on the line.

There are many sites of critical facilities and infrastructure that are located within the City and are not retrofitted to mitigate damages from the extreme winds that accompany tornado events. These facilities include: Wimberley Community Center, Wimberley Volunteer Fire Department, Wimberley EMS, and Wimberley City Hall. Damages sustained by a tornado event to these facilities could hinder the ability to provide crucial services needed by the community.





Expansive Soils

Expansive Soils: Location

Figure 2.3 within Chapter 2 (the Risk Assessment portion within the Hays County HMP Update) shows the location of expansive soil areas for the City. The entire extent of the jurisdiction is classified as having less than 50 percent of the area underlain by soils with clays of high swelling potential, therefore all of the jurisdiction is equally at risk.

Expansive Soils: Previous Occurrences

There was no documentation of past site-specific events for structural damage due to expansive soils from local, State, or national databases queried.

Expansive soils cannot be documented as a time-specific event, except when they lead to structural and infrastructure damage. There are no specific damage reports or historical records of events in the City, however future events can occur.

Expansive Soils: Extent and Probability

Considering the amount of swelling potential within the jurisdiction, as well as the lack of reported events, the probability of a future event is low (0 - 1 occurrences in the next 10 years affecting less than 5 structures).

Expansive Soils: Impact

Foundation issues for slab buildings and road base pads for mobile homes are the most visible impacts to infrastructure and structures. Undocumented reports of impact include small cracks to foundation and terrain. Increased severity in weather and natural conditions lead to increased soil swelling, resulting in deeper and longer cracks in terrain and structure foundations, and possible structural shifting.

Expansive Soils: Vulnerability Summary

The lack of current problems documented in the community leads to a lessened concern for the issue. There are many residences in the community that were constructed 20 to 30 years ago, before the community was incorporated and before National Building Codes were adopted with specific codes for foundation work. As time progresses and the residential structures continue to age, the number of foundation issues will continue to emerge. A general lack of concern for the hazard creates a vulnerability due to the resulting lack of individual-level (homeowner) mitigation action for expansive soils.



Floods



Floods: Location

The location of low water crossings, as well as the 1% (100 year) and 0.2% (500 year) Annual Chance Event (ACE) floodplains for the City of Wimberley are shown in Figure WB.3. This figure represents the areas that are most affected by riverine flooding and is based upon newly developed hydrologic and hydraulic analysis. The new analysis is considered the best information available to date. Table WB.6 provides the total acreage in the jurisdiction that is located in the 1% and 0.2% floodplains.

Risk Assessment

Figure WB.3, Special Flood Hazard Areas and Low Water Crossings, City of Wimberley

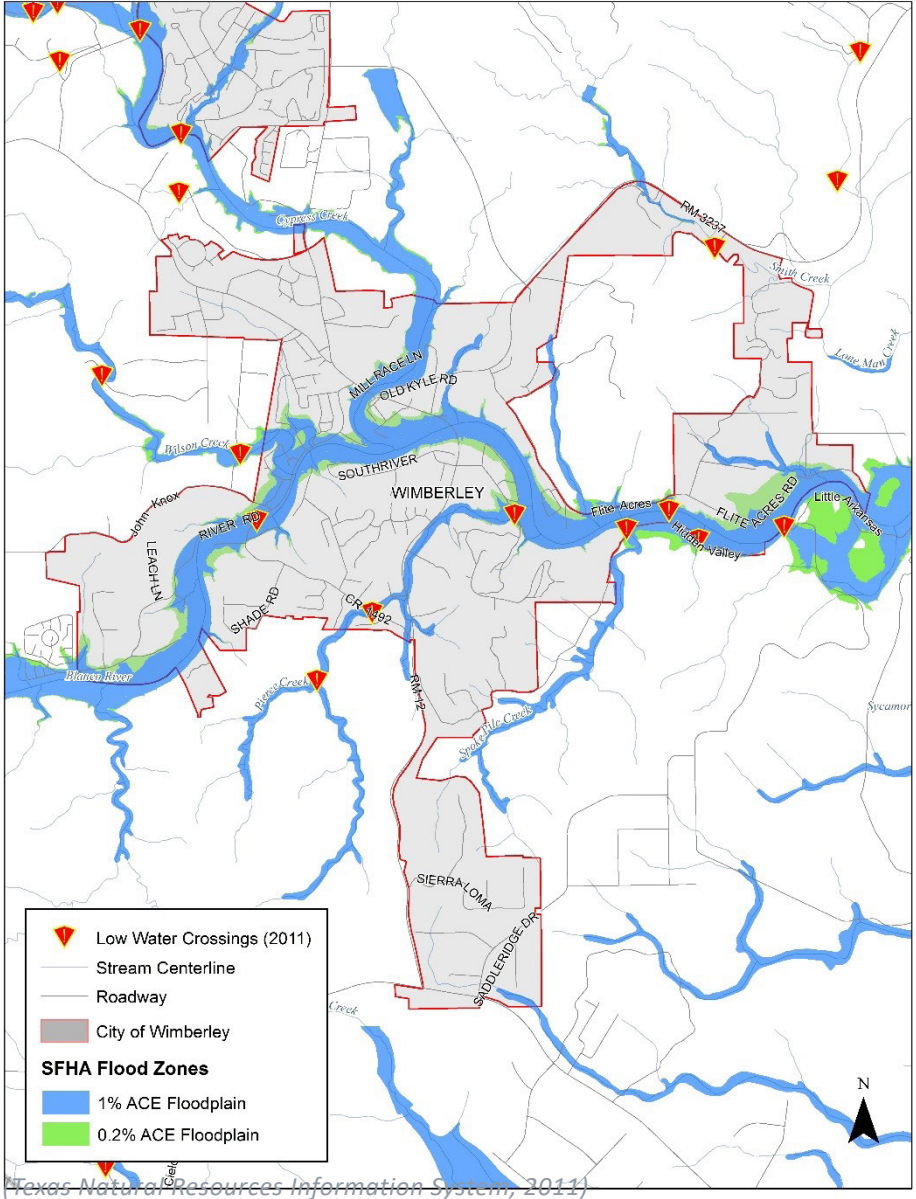


Table WB.6, City of Wimberley Floodplain Acreage

Jurisdiction	100yr (1%) Floodplain Acres (Includes Floodway)	500yr (0.2%) Floodplain Acres (Includes 100yr)
City of Wimberley	922	1,143



Floods: Previous Occurrences

Hays County was included in 3 Federal disaster declarations between 2013 and 2015, all related to flooding. Narratives detailing the impacts of these significant events are included in this annex under *Floods: Significant Past Events*. According to the NOAA Storm Events Database, there were 14 documented flood events listed for the City of Wimberley and 69 documented events listed for Hays County from the year 1997. While NOAA Storm Events Database lists events since 1997 for the County, events were not documented per jurisdiction until 2004. The flood events

reported for the City of Wimberley are shown in Table WB.7.

Fatality, injury and damage amounts are shown in Table WB.7, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table WB.7, Flood Events, City of Wimberley

Location	Date	Type	Fatalities	Injuries	Property Damage	Crop Damage
Wimberley	3/11/2007	Flash Flood	1	0	0.00	0.00
Wimberley	3/12/2007	Flood	0	0	0.00	0.00
Wimberley	7/4/2007	Flash Flood	0	0	0.00	0.00
Wimberley	7/23/2007	Flash Flood	0	0	0.00	0.00
Wimberley	7/28/2007	Flash Flood	0	0	0.00	0.00
Wimberley	9/10/2009	Flash Flood	0	0	0.00	0.00
Wimberley	6/9/2010	Flash Flood	0	0	0.00	0.00
Wimberley	2/4/2012	Flash Flood	0	0	0.00	0.00
Wimberley	10/31/2013	Flash Flood	0	0	1,000,000.00	0.00
Wimberley	10/31/2013	Flash Flood	0	0	0.00	0.00
Wimberley	5/23/2015	Flash Flood	0	0	0.00	0.00
Wimberley	5/24/2015	Flash Flood	10	0	100,000,000.00	0.00
Wimberley	10/30/2015	Flash Flood	0	0	1,000,000.00	0.00
Wimberley	6/2/2016	Flash Flood	0	0	0.00	0.00
Totals			11	0	\$102,000,000.00	\$0.00

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)

Past flooding events in Wimberley, Texas



Hays County Hazard Mitigation Plan, City of Wimberley Annex



Floods: Significant Past Events

Hays County received 3 disaster declarations for flooding within the past 5 years. According to the NOAA Storm Events Database, in October of 2013, (Disaster 4159-DR), thunderstorms produced heavy rain that led to flash flooding in Wimberley. Public reports of 14 inches of rain fell near the City and this rainfall impacted the Blanco River Watershed and the Onion Creek Watershed. The Blanco River crested at 26.74 feet within the City. Reports indicate that the Blanco River was near or slightly higher than the 1998 flood of record and 100 feet out of its banks. Several

roads were damaged and several homes were flooded. Across Hays County, 47 homes sustained minor damage, 24 sustained major damage, and 1 home was destroyed.

According to the NOAA Storm Events Database, in May of 2015, (Disaster 4223-DR), thunderstorms produced heavy rain that caused flash flooding. Rainfall totals of 10 to 13 inches were reported upstream in southern Blanco County and this runoff entered the Blanco River and Little Blanco River. The Fischer Store Road bridge over the Blanco River was destroyed by flood waters west of Wimberley. The Blanco River, downstream from the bridge at Wimberley reached a record crest. The gauge failed at 40 feet and the USGS later estimated the crest at 44.9 feet (175,000 cfs). This height was more than 10 feet over the previous record height of 33.3 feet in 1929. Homes along the banks of the Blanco River from the City of Blanco, through Wimberley, and down to San Marcos experienced this historic flood. Many homes were totally destroyed and swept downstream or struck by large debris, including large cypress trees which were uprooted from the banks of the river. The river experienced rises that exceeded 20 feet in 1 hour. Estimates of insured losses are approximately 100 million dollars. Overall in Hays County including Wimberley and San Marcos, 321 homes were destroyed, with hundreds more heavily damaged. According to the Office of Emergency Services, FEMA awarded over 3.5 million dollars in public assistance to Hays County in response to this disaster.

According to the NOAA Storm Events Database, in October of 2015, (Disaster 4245-DR), thunderstorms produced heavy rain that caused flash flooding sending water over the Hwy 12 bridge at Cypress Creek in Wimberley. Rainfall totals from that morning totaled over 10 inches, much of that rain coming in only a few hours. Several businesses in downtown Wimberley along Cypress Creek were flooded and damaged. The Blanco River was just a few feet short of overtopping the Highway 12 bridge.

Floods: Extent

Flood extent is described through a combination of ground elevation, river heights, 100-year Water Surface Elevations (WSE's) and HAZUS depth grids. Areas along the Blanco River in the community are exposed to some of the greatest flood extents. An example of flooding within the jurisdiction is the area along the Blanco River near the RR 12 bridge. This area has an approximate overbank ground elevation of 838 feet with an intersecting 100-year WSE of 843 feet. For a 100-year event, water depth of approximately 5 feet can be expected within this area. A further analysis of the Blanco River height is described below. It should be noted that the topography of this area is varied, leading to different extent classifications, but all areas along the Blanco River and River Road are susceptible to major events. See the *Floods: Significant Past Events* sections for more information.

With the Blanco River having an approximate normal in-channel elevation of 801 feet at RR 12 (per Light Detection and Ranging [LiDAR] and USGS gauge data), and an intersecting 100-year WSE of approximately of 840', flood depths would be 39 feet.

Floods: Probability

Probability has been calculated on the basis of NOAA reported events, as a standard, consistent calculation method for all hazards profiled with the Hays County HMP. Based on 14 reported events in 12 years, the City of Wimberley can expect a flood event approximately once a year on average in the future, with flood water depths of 39 feet.





Floods: Impact

The following describes the inventory counts and building replacement values for the jurisdictional area.

Wimberley Building Counts			
Residential	Commercial	Other	Total
1,439	110	51	1,600

Wimberley Building Replacement Value		
Building (\$)	Content (\$)	Total (\$)
436,857,469	253,346,208	690,203,677

A Probabilistic 100-year Return Period HAZUS-MH 3.2 analysis was run on the participating communities. HAZUS results are calculated to census blocks. This analysis utilized the best available LiDAR (COA 2012 and CAPCOG 2008) and Depth Grids. These blocks were then intersected with Wimberley to run a weighted area analysis for jurisdictional results. The following paragraphs describe the results from the 100-year Return (1% Annual Chance Event) weighted area analysis.

Past flooding events in Wimberley, Texas





HAZUS-MH Results

General Building Stock Damage

HAZUS estimates that 293 buildings will be at least moderately damaged in Wimberley. “at least moderately damaged” is defined by HAZUS as greater than 10% damage to a building. The majority of damage can be expected to impact residential areas (99%). The remaining damages (1%) are expected for commercial, industrial, agricultural and religious buildings.

Residential Buildings	Commercial Buildings	Other Buildings	Total Buildings
293	0	1	294

Building-Related Losses

Exposed Value is the total building and content values for structures within the community. The exposed value for the community is \$690,203,677. The total building-related losses were \$127,493,024 for this scenario. This represents 18.5% of the total replacement value of the community. Loss values are divided into building and content loss dollars.

Building Loss (\$)	Content Loss (\$)	Total Loss (\$)
76,292,272	51,200,752	127,493,024

Essential Facility Damage

HAZUS does not estimate any critical facilities or infrastructure interruption for more than 1 day. The model estimates that 100% of community hospital beds are ready for use by patients already in the hospital and for those injured by an event.

Debris Generation

HAZUS estimates the amount of debris that will be generated in this scenario at a total of 24,557 tons. If the building debris tonnage is converted to an estimated number of truckloads, it will require 983 truckloads (with 1 to 25 tons per truck) to remove the building debris generated.

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS also estimates the number of people displaced that will require accommodations in temporary public shelters. The model estimates 626 people will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 475 people will seek temporary shelter in public shelters.

Floods: Vulnerability Summary

Floods are a great threat to the City of Wimberley. With many residential structures located along the river, there are concerns for the safety of the residents who live in the neighborhoods that border the river. Even in cases of homes that are on high elevations in the community, there are areas where residents can be trapped during flooding events, due to inadequate culverts at 2 crossings on Leveritt’s Creek (according to Master Transportation Plan). Residents along Green Acres Drive can be trapped between flooding at Leveritt’s Creek and high water at Wilson Creek, and residents of Crown Estates can be trapped between high water on the Blanco River and water over Leveritt’s Loop. In addition, the single lane crossing on Wilson Creek at Green Acres Drive overtops with just minor creek flooding.





Residents are trapped in the area between Wilson Creek and the Blanco River when both waterways flood and the Blanco River covers River Road. Residents in the West CR 1492 area can be trapped between high water on the Blanco River and Pierce Creek during flooding. In heavy rain, water sheet-flows off the west hillside and covers RR 12, blocking emergency traffic. Inadequate bar ditches and cross culverts along the highway exacerbate this problem. Under major flood conditions, the Valley Drive structure crosses over Pierce Creek becomes overtopped and prohibits vehicle access to Paradise Hills subdivision. Flite Acres Road is overtopped

by 2 creeks during flood conditions due to inadequate culverts at the crossings on Hidden Valley Road and Spoke Pile Creek.

In addition to the accessibility problems, there are also issues with reliable flood data by which to regulate the floodplain responsibly. As of late 2016, Wimberley has had to utilize Advisory Base Flood Elevation levels due to the significant floods of record experienced in 2015. These will change again when new Flood Insurance Rate Maps are published in 2017.

According to community testimony, 350 Pre-FIRM and Post-FIRM homes were lost during the floods. To completely mitigate risk, buyout activities are ongoing in Wimberley to reduce risk to human life and structures in that area if affected again.

In addition to the impacts to residential structures and human life, there is also the vulnerability to the roads and bridges that support the community. One vulnerability is that even though the roads and bridges are insured by a policy maintained by the community, the policy coverage only funds replacement costs. The policy does not fund mitigation, leaving reconstruction efforts that result in similar structures to those that failed before.

National Flood Insurance Program Repetitive Loss (RL)

The City of Wimberley is a current participant in the National Flood Insurance Program (NFIP) and has 24 tallied RL payments (as of September of 2016) with an average total (building & contents) payment of \$74,908.97.

Structure Type	Number of Structures	Amount of Claims
Residential	10	\$1,197,810.43
Non-Residential	2	\$247,204.96

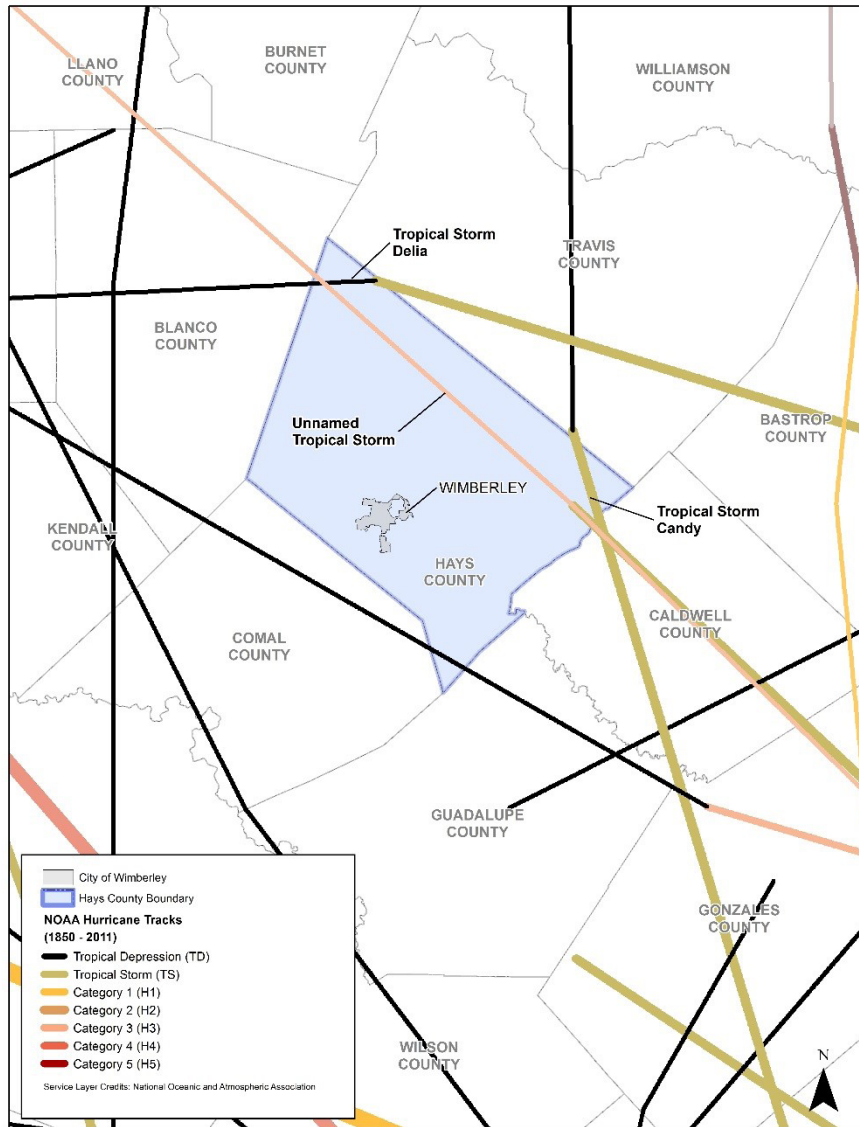


Hurricanes/Tropical Storms

Hurricanes/Tropical Storms: Location

Due to the regional nature of a hurricane or tropical storm event, the entire extent of the City of Wimberley is equally exposed to a hurricane or tropical storm. Figure WB.4 illustrates the location of the planning area with historical hurricane and tropical storm paths documented by NOAA from 1850 to 2011.

Figure WB.4, Historical Hurricane/Tropical Storm Paths, City of Wimberley



(National Oceanic and Atmospheric Administration, 2016)

Hurricanes/Tropical Storms: Previous Occurrences

Previous events are described below based on the NOAA Storm Events Database for Tropical Storm ermine and NOAA Hurricane Tracker for all other events. By the time most hurricanes reach the County, they are tropical storms, depressions or thunderstorms. Because hurricane and tropical storm events occur on a regional scale, all events listed for Hays County have been included, as they would impact the City of Wimberley.

July 13 to July 22, 1909 – An unnamed storm made landfall near Freeport, as a Category 3 Hurricane. This storm impacted Hays County and participating communities as a tropical depression with wind speeds





up to 30 knots. No significant damages, injuries, or fatalities were reported for the HMP update area.

June 22 to June 26, 1968 – Tropical Storm Candy made landfall near Port Aransas. This storm impacted Hays County and participating communities as a tropical storm with wind speeds slowing to 30 knots as a tropical depression just after leaving the County. No significant damages, injuries, or fatalities were reported for the City.

September 1 to September 7, 1973 – Tropical Storm Delia made landfall near the border of Brazoria and Matagorda counties. This storm impacted Hays County

and participating communities as a tropical storm with wind speeds slowing to 30 knots as a tropical depression just after leaving the County. No significant damages, injuries, or fatalities were reported for the jurisdiction.

September 6 to September 8, 2010 – According to the NOAA Storm Events Database, Tropical Storm Hermine made landfall near the Texas/Mexico border on the night of September 6. South Central Texas was hit very hard with widespread rains of 8 to 12 inches across much of the IH-35 corridor from Austin down to San Antonio.

Hurricanes/Tropical Storms: Extent and Probability

The Saffir-Simpson Scale measures pressure, wind speed, and storm surge in 5 categories. According to the reported previous hurricane occurrences in the jurisdiction, the maximum hurricane extent experienced was categorized as a tropical storm. Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of storm extents.

Based on 4 reported events in 107 years, a hurricane or tropical storm event occurs approximately every 27 years on average in Hays County. Since hurricane and tropical storm events can happen anywhere throughout the HMP update area, the City of Wimberley's future probability is assumed to be similar to the surrounding County areas. In the future, the City can expect an event approximately once every 27 years on average, of up to a magnitude of a tropical storm at a 100-year Max Wind Speed of 76 mph based on historical extents and HAZUS analysis.

Hurricanes/Tropical Storms Impact

A Probabilistic 100-year Return Period HAZUS-MH 3.2 analysis was run for the City of Wimberley. The following describes the results of this analysis.

HAZUS-MH Results

General Building Stock Damage

The total property damage losses were \$117,123. The majority of damage can be expected to impact residential areas (98%). The remaining damages (2%) are for commercial, industrial, agricultural and religious buildings. While some building damage is experienced, it is estimated that no buildings will be completely destroyed or experience severe damage. Exposed Value is the total building and content values for structures within the community. Loss values are divided separately for building and content loss in dollars.

Exposed Value (\$) (Building + Content)	Building Loss (\$)	Content Loss (\$)	Total Loss (\$)
690,203,677	117,121	2	117,123





Essential Facility Damage

HAZUS does not estimate any critical facilities or infrastructure interruption for more than 1 day. The model estimates that 100% of community hospital beds are ready for use by patients already in the hospital and for those injured by the hurricane.

Debris Generation

HAZUS estimates the amount of debris that will be generated by the hurricane at a total of 4 tons. Of the total amount brick/wood comprises 100% of the total. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckload (with 1 to 25 tons per truck) to remove the building debris generated by the hurricane.

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number people displaced that will require accommodations in temporary public shelters. The model estimates no households to be displaced due to the hurricane. While there is an estimation of over \$117,000 in property damages expected, it is aforementioned that “no buildings would be completely destroyed or experience severe damage.” Residents would likely remain in their homes as damages were repaired, therefore no temporary shelter is needed.

Hurricanes/Tropical Storms: Vulnerability Summary

Similar to the impacts of windstorms, hailstorms, and lightning, Wimberley can expect to be impacted with debris and possible utility interruptions of critical infrastructure, if the event is a stronger magnitude than those previously experienced by the City. In addition, the community’s proximity to IH-35 could lead to traffic delays caused by major evacuation efforts, if the highway is used as an evacuation route for coastal residents.



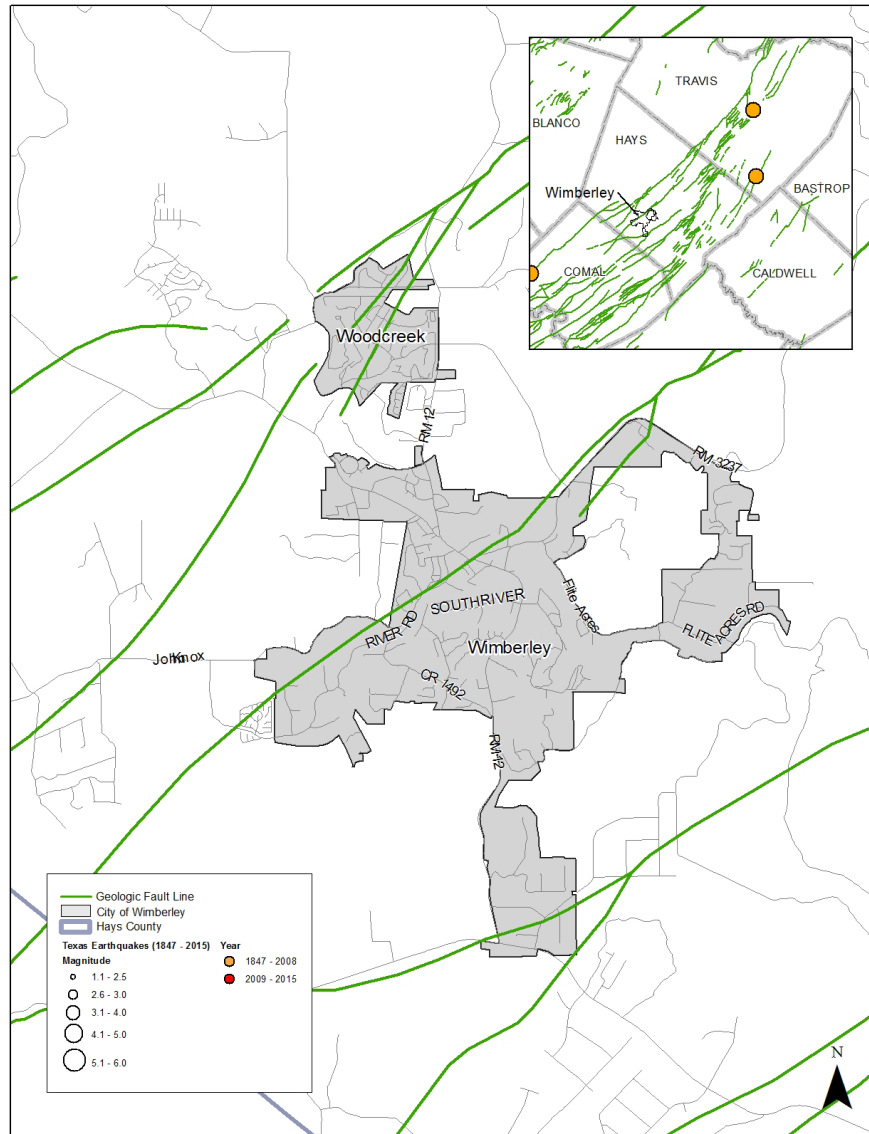


Earthquakes

Earthquakes: Location

Locations within proximity to fault lines are typically the areas most at risk for earthquakes. Figure WB.5 shows USGS documented fault lines and the locations of earthquakes from 1847 to 2015 in relation to the City of Wimberley.

Figure WB.5, Texas Earthquakes, 1847 – 2015, City of Wimberley



(USGS Earthquake Hazard Program, 2015)

Earthquakes: Previous Occurrences

According to USGS 1847-2015 data, there have been no documented earthquake events for the City of Wimberley, as illustrated in Figure WB.5.

Earthquakes: Extent and Probability

Earthquakes are measured by Peak Ground Acceleration (PGA). The HAZUS Max PGA for the planning area is 1.53% (see Earthquakes: Impact Section for a description of the HAZUS Analysis). This corresponds to the Modified Mercalli Scale Category IV, with light perceived shaking and no potential structure damage. HAZUS measures PGA on a census tract level. Cities within more than 1 census tract were assigned the





highest PGA level to reflect the maximum possible extent. Refer to Chapter 2 for extent scale descriptions (the risk assessment portion of the main plan document).

As there have been no recorded previous occurrences of earthquakes for the City of Wimberley and the PGA is less than 2% for the area, the probability of an earthquake in the City in the future is low (0 - 1 occurrences in the next 10 years at up to a 500yr PGA of 1.53%).

Earthquakes: Impact

The FEMA How-To Guidance, Understanding Your Risks (FEMA 386-2, page 1-7), suggests the earthquake hazard should be profiled if the PGA is greater than 3%g, where PGA measures the acceleration of gravity (g). The City's PGA is less than 3%g (0.03) and there have been no recorded earthquakes in or near the jurisdiction. Therefore, only a minimum level-1 HAZUS analysis was profiled using the 500-year probability event scenario. The HAZUS analysis produced a PGA of 1.53%. HAZUS scenario would produce \$0 in building damages (Residential, Commercial, Agriculture, Religious and Government) from an event. Critical facilities and Infrastructure would not experience any loss of service. There would be no critical facilities or infrastructure that would experience moderate to complete damage. No debris would be generated from this event and no people or households would require temporary housing. There would be no moderate, extensive or completely damaged buildings by this event. HAZUS estimates no residents are expected to be displaced from their homes or will require accommodations in temporary public shelters due to the simulated earthquake. Additionally, there would be no casualties or fatalities from this event.

Earthquakes: Vulnerability Summary

While the probability of an earthquake in Wimberley is low, with no significant prior events on file, there are fault lines within the community that could cause impact if there were to be an increase in seismic activity in the area. There are 3 fault lines located within the jurisdiction according to USGS data. Wimberley could expect to be impacted with debris and possible utility interruptions if an event were to occur in an unlikely and unprecedented scenario exceeding the 500-year probability event scenario run in HAZUS. If an event were to incapacitate a roadway, emergency responders would be hindered from responding, leaving the residents at risk.

The following thoroughfares are crossed by the USGS fault lines displayed on Figure WB.5: RM 32, RM 3237, Winters Mill, and River Road.

Additionally, the following critical facilities, infrastructure and non-critical public facilities are located within 1 mile of a fault line within the community (according to HAZUS and community submitted critical facility data): Wimberley Community Center, Wimberley Volunteer Fire Department, Hays County Sheriff Substation, Wimberley EMS, Rocky River Ranch, Wimberley Communication Building, and Katherine Ann Porter School.





Page 25, 26, and 27 Dam/Levee Failure have been redacted from this copy of the plan.

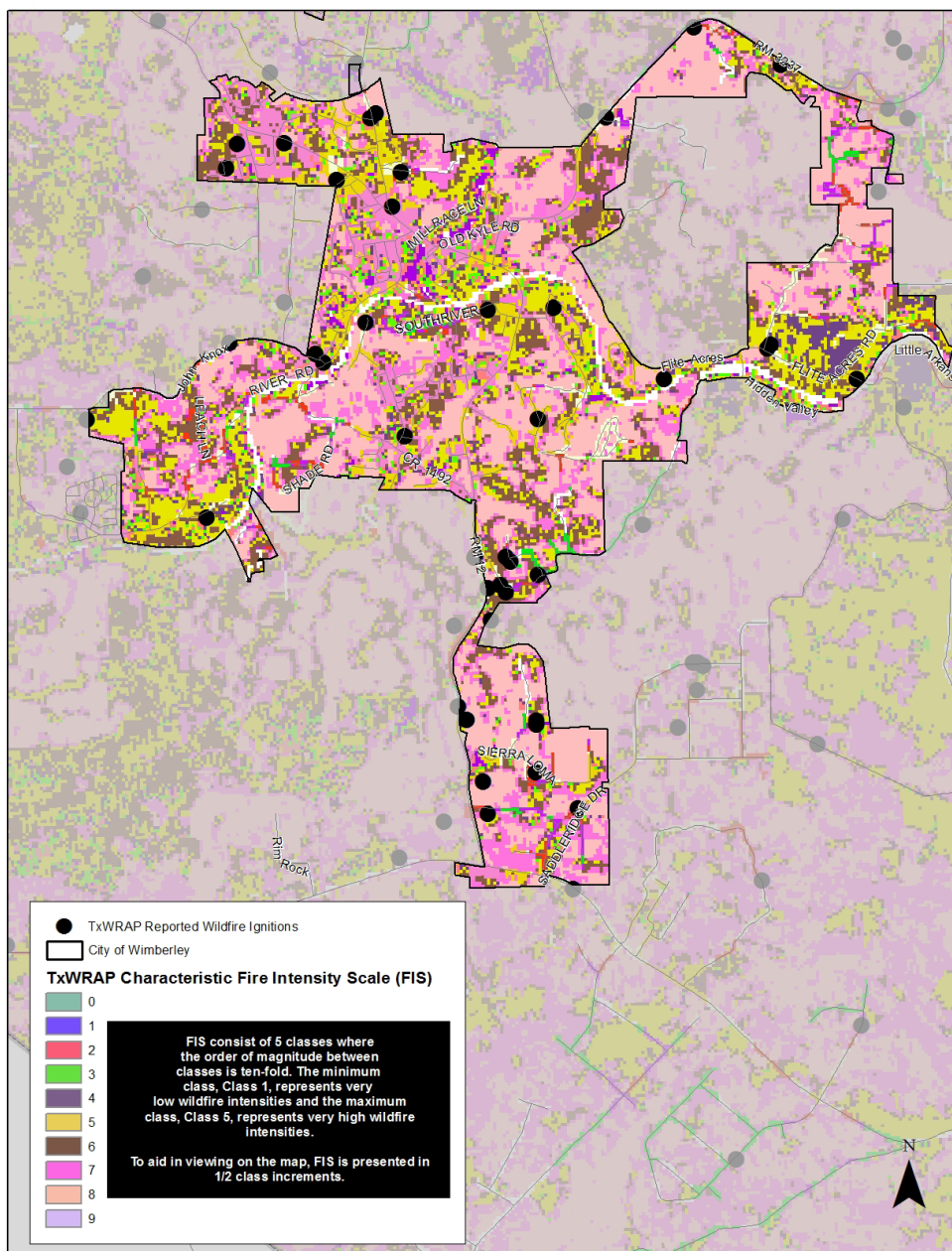


Wildfires

Wildfires: Location

Wildfires can be ignited from a variety of sources including lightning or human activity such as campfires, smoking, arson, or equipment use. The Texas A&M Forest Service's Texas Wildfire Risk Assessment Portal (TxWRAP) can be used to help communities understand their wildfire risk. Figure WB.7 below shows the location of TxWRAP's documented wildfire occurrences with Fire Intensity Scale (FIS) classifications within the City of Wimberley. TxWRAP identifies FIS areas as those where wildfire fuels and associated potential dangerous fire behavior exist, based on a weighted average of 4 percentile weather categories.

Figure WB.7, Fire Intensity Scale (FIS) and Reported Wildfire Ignitions, City of Wimberley



(Texas A&M Forest Service, 2016)



**Wildfires: Previous Occurrences**

Table WB.9 shows the reported wildfire ignitions within the City of Wimberley, according to TxWRAP and USGS Federal Fire Occurrence data from the years 1980 to 2015.

Table WB.9, Wildfire Ignitions, City of Wimberley

FPA ID	Date	Fire Size (Acres)
SFO-TX0484-177112	7/5/2008	0.1
SFO-TX0482-120622	1/30/2008	0.1
SFO-TX0482-130380	3/11/2008	0.1
SFO-TX0482-114368	1/1/2008	0.1
TFS-TXFD2009-214506	6/26/2009	0.1
TFS-TXFD2009-214522	7/22/2009	0.1
SFO-TX0482-130818	3/16/2008	0.25
TFS-TXFD2009-192896	3/16/2009	0.3
SFO-TX0482-136455	3/16/2008	0.3
SFO-TX0482-114363	12/31/2007	0.3
SFO-TX0482-114356	12/18/2007	0.3
TFS-TXFD2009-214497	5/18/2009	0.5
SFO-TX01440604-3801	12/12/2004	1
SFO-TX0483-73718	7/11/2008	1
SFO-TX01440604-466	10/11/2004	1
SFO-TX02240705-4150	6/29/2005	1
TFS-TXFD2009-177186	1/17/2009	1
SFO-TX02240705-15637	9/13/2005	1
SFO-TX02240706-77189	5/27/2006	1
SFO-TX02240705-15644	10/29/2005	2
SFO-TX02240705-15640	10/12/2005	2
SFO-TX0482-144130	6/23/2008	2
SFO-TX02240705-3726	5/6/2005	2
SFO-TX01440604-3803	12/9/2004	2
SFO-TX02240705-3735	4/1/2005	5
SFO-TX0482-120620	1/29/2008	20

Wildfires: Extent and Probability

Table WB.10 lists the Fire Intensity Acreage for the City, according to the Texas A&M Forest Service TxWRAP Community Summary Report. For a description of the FIS, refer to Chapter 2, the risk assessment portion of the main plan document.




Table WB.10, TxWRAP Fire Intensity Acreage, City of Wimberley

Class	Acres	Percent
Non-Burnable	1,138	19.70%
1 (Very Low)	107	1.90%
1.5	250	4.30%
2 (Low)	101	1.80%
2.5	96	1.70%
3 (Moderate)	770	13.30%
3.5	689	11.90%
4 (High)	758	13.10%
4.5	1,862	32.30%
5 (Very High)	0	0.00%
Total	5,772	100.00%

Based on 26 reported events in 35 years, the City of Wimberley future probability for a wildfire event is approximately once a year (on average) in the future with up to a potential fire intensity of 4.5, or “High” classification on the TxWRAP FIS.

Wildfires: Impact

Impact on the community can be measured using TxWRAP Housing Density levels within the WUI. Areas with a higher housing and population density would be affected to a greater extent than rural areas, and especially in areas near burnable fuels. In the event of a wildfire in high density areas of population, residential structures would be damaged or destroyed, critical infrastructure such as water, sewer and electrical services would be interrupted and residents would experience injury or loss of life. Table WB.11 below lists the population, percent of total population, WUI acreage and percent of WUI acreage for the City of Wimberley, according to the Texas A&M Forest Service TxWRAP Community Summary Report.

Table WB.11, WUI Acreage, City of Wimberley

Housing Density	WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
LT 1hs/40ac	10	0.2 %	431	8.4 %
1hs/40ac to 1hs/20ac	40	0.9 %	475	9.3 %
1hs/20ac to 1hs/10ac	110	2.5 %	697	13.6 %
1hs/10ac to 1hs/5ac	238	5.3 %	777	15.2 %
1hs/5ac to 1hs/2ac	1,144	25.7 %	1,560	30.5 %
1hs/2ac to 3hs/1ac	2,910	65.4 %	1,176	23.0 %
GT 3hs/1ac	0	0.0 %	0	0.0 %
Total	4,452	100.0 %	5,116	100.0 %





Wildfires: Vulnerability Summary

The greatest vulnerability exists in heavily treed areas where homes are surrounded by vegetative growth, where there is not an adequate buffer between the vegetation and the homes. (Currently, there is still not a requirement for a buffer.) The current subdivisions were approved before the City was incorporated. The largest and most exclusive subdivision in Wimberley is Paradise Hills with a single point of entry/exit that is a low water crossing. There are also vegetated valleys in the neighborhood that are susceptible to the spread of wildfire. Alternative emergency access for

Paradise Hills and similar neighborhoods should be formalized in a plan. First responders are also at risk in situations where access is limited.

HOA implementation of a cooperative program to promote fire safety, such as Firewise, would be beneficial to encourage a buffer zone. While there are several neighborhoods that have Firewise in their subdivision, a community-wide program could benefit Wimberley greatly. Open burn ordinances give Wimberley burn ban authority for the community. City Hall works with the community HOAs to put out alerts and warnings.

In addition to vegetative fuel challenges and emergency access problems, there are also enhancements to hydrant systems that would improve firefighting capabilities. Water supply lines are not sized for firefighting and could break water lines that are not equipped for the amount of pressure applied by attempting to connect fire apparatus. Presently, approximately 50% of the community is equipped with fire hydrants.



2.2 Risk Ranking Result

On January 12, 2017, members of the City of Wimberley MPC completed a questionnaire as part of the Hays County HMP Update: Risk Assessment. The questions covered the risk associated with the hazards that affect each community based on the level of concern over each profiled hazard, the hazards' impact on health and safety, as well as impact to property and business continuity. The answers from this questionnaire were combined with public survey results on perception of risk. The values from both sources were analyzed using the Halff Risk Ranking Tool (details regarding the risk ranking tool are in Chapter 2, the risk assessment portion of the main plan document). The results provided a quantified ranking of risk, with values ranging from 0 to 100. The results for Wimberley are shown below (hazard values shown from highest risk to lowest):

Ranking Order	Hazard	Risk Ranking Value
1	Floods	99.4
2	Wildfire	95.9
3	Wind Storms	94.7
4	Severe Winter Storms	89.1
5	Drought	74.7
6	Lightning	72.8
7	Tornadoes	72.2
8	Hail Storms	55.0
9	Extreme Heat	54.4
10	Expansive Soils	47.5
11	Hurricanes/Tropical Storms	41.3
12	Dam/Levee Failure	36.3
13	Earthquakes	33.1
-	Land Subsidence	Not Profiled



Section 3: Mitigation Strategy

This section examines the community's ability to perform mitigation (a review of existing capabilities is shown in Table WB.12) and identifies specific mitigation actions to address vulnerabilities for each hazard profiled in the Hays County HMP Update. The mitigation strategy is the application of actions into an approach for performing structural and non-structural mitigation efforts within the jurisdiction. Actions are also prioritized and considered for incorporation into other community programs, regulations, projects or plans.

Completed and canceled actions are also included in a separate section for future reference.

3.1 Existing Capabilities

Table WB.12, Existing Capabilities

Capability Name	Capability Type	Ability to Expand/Improve
Mayor	Elected Official	Political support and funding for mitigation actions. Could attend mitigation information session to learn about community risks and mitigation strategy.
City Administrator/Floodplain Administrator	City Staff	Support for implementation of mitigation actions./ Responsibility for continued participation in the NFIP. Attend advanced floodplain management training.
Emergency Management Coordinator	Contract Staff	Management of City-level HMP updates and provides expertise on hazard mitigation. Attend advanced floodplain management training.
Engineer	Consultant	Expertise in structural mitigation projects and compliance with flood damage prevention ordinance. Attend advanced floodplain management training.
Sales Tax	Funding	Provides potential funding for Hazard Mitigation items.
Permitting and Licensing Fees	Funding	Provides potential funding for Hazard Mitigation items.
Chapter 211 of the Local Government Code: Zoning	Authority	Authorizes the City to regulate Zoning . (State-level code)
Chapter 213 of the Local Government Code: Municipal Comprehensive Plans	Authority	Authorizes the City to adopt a comprehensive plan for the long-range development of the City. (State-level code)
Chapter 214 of the Local Government Code	Authority	Authorizes the City to have regulatory authority as it related to building code (such as structural integrity and plumbing) (State-level code)
Code Chapter 151 Building Regulations; Construction Ordinance	Regulations	Regulation over building in the City (American Legal Publishing Corporation, 2001). Can be modified to directly refer to Mitigation Plan risk assessment for integration into comprehensive planning efforts.
Code Chapter 35 Fee Schedule Ordinance	Regulations	Regulates over fees the community can charge (none found) (American Legal Publishing , 2000). Can be updated to obligate special funding for mitigation projects.
Code Chapter 32 Emergency Management Ordinance	Regulations	Establishes Emergency Management Program (American Legal Publishing Corporation, 2003). Can be enhanced to add language specific to the mitigation mission for emergency management.



Table WB.12, Existing Capabilities

Capability Name	Capability Type	Ability to Expand/Improve
Code Chapter 153 Flood Damage Prevention Ordinance	Regulations	Regulation over floodplain development (American Legal Publishing Corporation, 2001). Can adopt higher standards, such as freeboard, in order to mitigate to more stringent standards.
Code Chapter 92 Open Burning Ordinance	Regulations	Regulation rights for fire protection purposes (American Legal Publishing Corporation, 2005). Can be enhanced to require other wildfire mitigation measures.
Code Chapter 154 Subdivision Control Ordinance	Regulations	Regulation control for subdivisions in Wimberley (American Legal Publishing Corporation, 2001). Can be enhanced to ensure proper evacuation route considerations are made during subdivision planning.

3.2 National Flood Insurance Program Participation

The City of Wimberley participates in the National Flood Insurance Program. The City Secretary/Interim City Administrator currently serves as the Floodplain Administrator. (The position is currently undergoing transition as the community seeks a new City Administrator.) The program was run locally with the assistance of Professional Engineer services when necessary. The community has adopted a Flood Damage Prevention Ordinance that incorporates 1 foot of freeboard above the base flood elevation for all development of structures within the Special Flood Hazard Area. The City will continue to explore options for higher standards as well as application for participation in the Community Rating System. The City has 277 NFIP policies, as of June 2016, with a total of \$66,356,900 of insurance coverage in force.

3.3 Mitigation Goals

The plan-level Mitigation Goals can be found in Chapter 3, The Mitigation Strategy portion of the Hays County HMP Update. These mitigation goals apply to each community and were mutually decided upon as the guiding goals for the development of actions in each planning area.



3.4 Mitigation Actions

*E= Actions reducing risk to existing buildings and infrastructure

*F= Actions reducing risk to new development and redevelopment

Number/Title	Hazard	Item Description	Implementation Agency	
1 FM 1492 at Blanco River	Floods	Replace low water crossing.	City of Wimberley City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$1,000,000/ General Fund/In-Kind Services		48 months	Delayed	E
Cost and Benefit Considerations				
Cost effective according to community calculations.				

Number/Title	Hazard	Item Description	Implementation Agency	
2 Hidden Valley at Blanco River	Floods	Replace low water crossing.	City of Wimberley City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$800,000/ General Fund/In-Kind Services		48 months	Delayed	E
Cost and Benefit Considerations				
Cost effective according to community calculations.				

Number/Title	Hazard	Item Description	Implementation Agency	
3 Little Arkansas at Blanco River	Floods	Replace low water crossing.	City of Wimberley City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$1,000,000/ General Fund/In-Kind Services		48 months	Delayed	E
Cost and Benefit Considerations				
Cost effective according to community calculations.				



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Number/Title	Hazard	Item Description	Implementation Agency	
4 Valley Drive at Pierce Creek	Floods	Replace low water crossing.	City of Wimberley City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$500,000/ General Fund/ In-Kind Services		48 months	Delayed	E
Cost and Benefit Considerations				
Cost effective according to community calculations.				

Number/Title	Hazard	Item Description	Implementation Agency	
5 Flite Acres Road	Floods	Replace low water crossing.	City of Wimberley City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$500,000/ General Fund/ In-Kind Services		48 months	Delayed	E
Cost and Benefit Considerations				
Cost effective according to community calculations.				

Number/Title	Hazard	Item Description	Implementation Agency	
6 FM 1492 at Pierce Creek	Floods	Replace low water crossing.	City of Wimberley City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$250,000/ General Fund/ In-Kind Services		48 months	Delayed	E
Cost and Benefit Considerations				
Cost effective according to community calculations.				



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Number/Title	Hazard	Item Description	Implementation Agency	
7 Wilson Creek at River Road	Floods	Replace low water crossing.	City of Wimberley City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$200,000/ General Fund/ In-Kind Services		48 months	Delayed	E
Cost and Benefit Considerations				
Cost effective according to community calculations.				

Number/Title	Hazard	Item Description	Implementation Agency	
8 Green Acres Dr. at Fire Station	Floods	Replace low water crossing.	City of Wimberley City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$250,000/ General Fund/ In-Kind Services		48 months	Delayed	E
Cost and Benefit Considerations				
Cost effective according to community calculations.				

Number/Title	Hazard	Item Description	Implementation Agency	
9 Leveritt's Loop	Floods	Replace low water crossing.	City of Wimberley City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$150,000/ General Fund/ In-Kind Services		48 months	Delayed	E
Cost and Benefit Considerations				
Cost effective according to community calculations.				



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Number/Title	Hazard	Item Description	Implementation Agency	
10 Spoke Hollow Dr. at Spoke Pile Creek	Floods	Replace low water crossing.	City of Wimberley City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$150,000/ General Fund/ In-Kind Services		48 months	Delayed	E
Cost and Benefit Considerations				
Cost effective according to community calculations.				

Number/Title	Hazard	Item Description	Implementation Agency	
11 River Road at Western City Limits	Floods	Replace low water crossing.	City of Wimberley City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$200,000/ General Fund/ In-Kind Services		48 months	Delayed	E
Cost and Benefit Considerations				
Cost effective according to community calculations.				

Number/Title	Hazard	Item Description	Implementation Agency	
12 Paradise Hills	Floods	Replace low water crossing.	City of Wimberley City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$90,000/ General Fund/ In-Kind Services		48 months	Delayed	E
Cost and Benefit Considerations				
Cost effective according to community calculations.				



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Number/Title	Hazard	Item Description	Implementation Agency	
13 River Road	Floods	Reconstruct Roadway along Blanco River.	City of Wimberley City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$850,000/ General Fund/ In-Kind Services		48 months	Delayed	E
Cost and Benefit Considerations				
Cost effective according to community calculations.				

Number/Title	Hazard	Item Description	Implementation Agency	
14 Little Ranches at Panther Creek	Floods	Reconstruct Low Water Crossing & Roadway.	City of Wimberley City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$1,000,000/ General Fund/ In-Kind Services		48 months	Delayed	E
Cost and Benefit Considerations				
Cost effective according to community calculations.				

Number/Title	Hazard	Item Description	Implementation Agency	
15 Hoots Holler	Floods	Reconstruct low water crossing & roadway.	City of Wimberley City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$1,000,000/ General Fund/ In-Kind Services		48 months	Delayed	E
Cost and Benefit Considerations				
Cost effective according to community calculations.				



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Number/Title	Hazard	Item Description	Implementation Agency	
16 Emergency Siren System	Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Floods, Hurricanes/Tropical Storms, Earthquakes, Dam/Levee Failure, Wildfires	Installation of 3 Emergency Siren System.	City of Wimberley City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$105,000/ General Fund/ In-Kind Services		48 months	Delayed	N/A
Cost and Benefit Considerations				
Cost effective according to community calculations				
Number/Title	Hazard	Item Description	Implementation Agency	
17 Promote Flood Insurance in the community (previously action 27 in 2011 plan, modified)	Floods	Placing National Flood Insurance Program information brochures in City Hall.	City of Wimberley City Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services, free brochures from FEMA		1 month	In progress	N/A
Cost and Benefit Considerations				
The cost and labor required to promote the NFIP is negligible. The benefit is difficult to estimate.				
Number/Title	Hazard	Item Description	Implementation Agency	
18 Acquisition or elevation of Repetitive Loss Properties (previously action 19 in 2011 plan, modified)	Floods	As of 09/2016, Wimberley has 12 repetitive loss properties that need mitigation to reduce the over \$1.7 Million in payments that have been made.	City of Wimberley City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
The estimated acquisition cost is \$100,000 per structure (\$1.2 million total for 12 structures). The estimated cost to elevate a residential structure a total of 3 feet in a shallow flooding area is \$30,000 per structure (\$360,000 total for 12 structures); Funding Sources: FEMA, TDEM, TWDB, GLO, Hays County/ General Fund/ In-Kind Services		48 months	Delayed	E
Cost and Benefit Considerations				
Cost effectiveness for these acquisitions or elevations are determined on a per structure or project basis.				

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Number/Title	Hazard	Item Description	Implementation Agency	
19 Adopt Higher Standards for Flood Damage Prevention Ordinance (previously action 20 in 2011 plan)	Floods	Adopt 2 foot freeboard in existing ordinance for new development and substantial repairs.	City of Wimberley City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services		6 months	Ongoing	E/F
Cost and Benefit Considerations				
This item would only take the amount of time/labor required to amend an ordinance within the City. The benefit would be for substantially improved or new development.				

Number/Title	Hazard	Item Description	Implementation Agency	
20 Attend Advanced Local Floodplain Management Courses to receive certification (previously action 21 in 2011 plan, modified)	Floods	Send certified member of staff to advanced courses.	City of Wimberley City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services, cost of accommodations for FEMA training off-site		6 months	Delayed	E/F
Cost and Benefit Considerations				
If attending the course at the Emergency Management Institute, the cost of the course would be very low, and only include a minimal meal ticket purchase. The benefit of an informed floodplain administrator would help both new and existing residents through guidance on how to mitigate flood damages to development.				

Number/Title	Hazard	Item Description	Implementation Agency	
21 Improve emergency communication/warning systems (previously action 22 in 2011 plan)	Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Floods, Hurricanes/Tropical Storms, Earthquakes, Dam/Levee Failure, Wildfires	Purchasing equipment and training personnel to improve local and Countywide emergency communication. Utilize system to provide information on hazards and community guidance on accessing emergency resources (such as cooling center locations for extreme heat).	Hays County Emergency Management	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$620,000/ General Fund/ In-Kind Services		Phased over 60 months	Ongoing	N/A
Cost and Benefit Considerations				
This action promotes public safety services through facility development, high quality equipment, adequate staffing, and healthy partnerships. Not independently cost-effective, but critical for minimizing loss of life and injuries during emergencies.				



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Number/Title	Hazard	Item Description	Implementation Agency	
22 Storm Ready Designation from National Weather Service (previously action 24 in 2011 plan)	Severe Winter Weather, Lightning, Hailstorm, Windstorm, Tornadoes, Floods, Hurricanes/ Tropical Storms	Application for designation that classifies community's level of preparedness for severe weather and storms.	City of Wimberley City Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services		6 months	Not Started	N/A
Cost and Benefit Considerations				
There is a high level of effort to complete the application, however no other cost applies. The level of increased preparedness would benefit the entire population.				

Number/Title	Hazard	Item Description	Implementation Agency	
23 Increase Public Awareness of Hazard Mitigation (previously action 27 in 2011 plan)	Drought, Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Expansive Soils, Floods, Hurricanes/Tropical Storms, Earthquakes, Dam/Levee Failure, Wildfires	Increasing public awareness of natural hazards and hazardous areas; distributing public awareness information regarding hazards and potential mitigation measures. Promotional sources would include City website, social media, and public education programs. Provide link to HaysInformed on local page.	City of Wimberley City Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services		1 month	Not started	N/A
Cost and Benefit Considerations				
There is minimal cost and labor required to make this enhancement to the existing Wimberley City website.				

Number/Title	Hazard	Item Description	Implementation Agency	
24 Adopt wildfire maps from Hays County Firewise project (previously action 28 from 2011 plan, modified)	Wildfires	Formally adopt the maps created through the Hays County application for Firewise designation in order to begin to control development in accordance with the avoidance of hazard areas, or development with consideration of proper mitigation.	City of Wimberley City Hall, in coordination with Hays County Fire Marshal's office	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services		6 months	Not started	E/F
Cost and Benefit Considerations				
The benefit of mitigating against wildfire for future development as well as for instituting fire mitigation in existing areas of development greatly saves the community from the costs of potential damages.				



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Number/Title	Hazard	Item Description	Implementation Agency	
25 Coordination of marketing Large Item Pick-up day for Wildfire Mitigation (previously action 33 from 2011 plan, modified)	Wildfire, Lightning, Windstorms, Tornadoes	Enhancement of existing large item pick-up to emphasis the wildfire mitigation benefits of cleaning brush and overgrown lots.	City of Wimberley Administrator in coordination with waste disposal service provider	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services		2 months	Ongoing	N/A
Cost and Benefit Considerations				
This slight change to marketing an existing event would likely lessen the risk for wildland fire for residents located within the Wildland Urban Interface.				

Number/Title	Hazard	Item Description	Implementation Agency	
26 Drought Monitoring Program (previously action 29 in 2011 plan, modified)	Drought	Provide widget on City homepage that provides the latest US Drought Monitor conditions for the day.	City of Wimberley Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services		6 months	Not started	N/A
Cost and Benefit Considerations				
This low cost monitoring and inclusion of drought water conservation measures will take more time than money to institute and could reduce the impacts of water shortage. All residents that use the water source would benefit.				

Number/Title	Hazard	Item Description	Implementation Agency	
27 Watershed Review Tour for Private Dams (Amended action 36 of 2011 plan)	Dam/Levee Failure, Floods	Plan for how to enforce flood damage prevention ordinance against encroachments in the floodway by inspecting for private dams that are not authorized and requirement of no-rise study when they are found to ensure neighbors are not at risk to be negatively impacted.	City of Wimberley Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services		6 months	Not started	E
Cost and Benefit Considerations				
This effort of enforcement will protect downstream properties and protect the community from liability from encroachments that create adverse impact. Although benefits are unquantifiable at this point, the cost is low enough for it to be negligible. Accessibility and responsibility should be coordinated with State dam safety staff.				

Hays County Hazard Mitigation Plan, City of Wimberley Annex

Number/Title	Hazard	Item Description	Implementation Agency	
28 Evacuation Plans/ Alternate road consideration (previously action 37 in 2011 plan)	Hurricanes/ Tropical Storms, Floods, Dam/ Levee Failure, Wildfire	Documentation of an evacuation plan that includes multiple exits for leaving the community.	City of Wimberley City Hall	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services		18 months	In progress	F
Cost and Benefit Considerations				
The cost of not establishing a way out of the community would greatly outweigh the cost of mitigating this risk of not being to get citizens out of danger.				

Number/Title	Hazard	Item Description	Implementation Agency	
29 Soil Compaction Requirement for Roads and Recommendation for Residential	Expansive Soils	Requirement for higher level of soil compaction for new road development. Recommendation for soil compaction to lessen the possible effects of expansive soils to accompany existing slab requirements for manufactured and mobile homes.	City of Wimberley City Hall	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services, cost of engineer support		6 months	Not Started	F
Cost and Benefit Considerations				
This recommendation would add a level of protection to future development of foundations so that they mitigate against expansive soil damage.				

Number/Title	Hazard	Item Description	Implementation Agency	
30 De-icing Contract Research/ Plan Development (previously action 32 in 2011 plan)	Severe Winter Weather	Creation of a plan that provides established procedures and negotiated service providers and rates for ice removal for the city streets.	City of Wimberley Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services		12 months	Not Started	N/A
Cost and Benefit Considerations				
By setting rates for ice removal for extreme cases of icy weather, the whole community could save money on potential price increases.				



Hays County Hazard Mitigation Plan, City of Wimberley Annex

Number/Title	Hazard	Item Description	Implementation Agency	
31 Develop water use public awareness campaign to ensure water for firefighting, provision of drinking water and reduction of groundwater depletion (previous action 30 in 2011 plan, modified)	Drought	Develop public information campaign to inform the public of water conservation practices.	City of Wimberley Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services		6 months	Not started	N/A
Cost and Benefit Considerations				
The intended benefit of a reduction in waste of water and in turn conservation of resources would greatly benefit all members of the community if practices are followed. The project is very cost-efficient.				

Number/Title	Hazard	Item Description	Implementation Agency	
32 Windstrap requirement on temporary structures	Severe Winter Weather, Windstorm, Tornadoes, Hurricanes/ Tropical Storms	Ordinance update to require windstrap installation on all temporary structures to lessen the impacts of wind as well as the occurrence debris.	City of Wimberley City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/In-Kind Services		6 months	Not started	E
Cost and Benefit Considerations				
This addition to the ordinances will make temporary structures resistant to winds and protect permanent structures from the debris created by unsecured temporary structures. The cost of strapping would be funded by the individual with the structure.				

Number/Title	Hazard	Item Description	Implementation Agency	
33 Restriction on development along Blanco River	Floods	Specific ordinance that limits development along the river in an effort to mitigate loss of life and property.	City of Wimberley City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/In-Kind Services		6 months	Not started	E/F
Cost and Benefit Considerations				
After recent flooding within the last 5 years, the community experienced both loss of lives and structures. This ordinance would cost only the labor to create and pass it as an ordinance, would be cost-effective .				



Hays County Hazard Mitigation Plan, City of Wimberley Annex

Number/Title	Hazard	Item Description	Implementation Agency	
34 Enhance Water Conservation Ordinance	Drought	Enhancement of existing ordinance in order to place more measures that would further protect the water supply for the community, through the promotion of rainwater collection and xeriscape through the incentives of permit fee waivers.	City of Wimberley City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/In-Kind Services		6 months	Not started	N/A
Cost and Benefit Considerations				
The cost of passing an ordinance amendment would be beneficial to all members of the community who utilize the water supply.				

Number/Title	Hazard	Item Description	Implementation Agency	
35 Seismic Building Code Provisions	Earthquakes	Review and possible incorporation of seismic building code provisions from International Building Codes.	City of Wimberley City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services		6 months	Not started	F
Cost and Benefit Considerations				
The cost of passing an ordinance amendment would be beneficial to all members of the community who are building new structures, as their structures will be more resilient.				




3.5 Capabilities Assessment

Evaluation/Prioritization of Actions

Each action added to the plan was developed using the Mitigation Action Summary Worksheet shown in Figure WB.8.

Figure WB.8, Mitigation Action Summary Worksheet

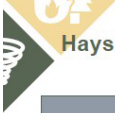


Hays County Hazard Mitigation Plan Update Process
Mitigation Action Summary Worksheet

Community Name: _____

Person completing questionnaire: _____

Mitigation Action/ Project Title	
Background/ Issue	
Opportunities for Integration	
Responsible Agency	
Partners	
Strategy for Existing Structures	



Hays County Hazard Mitigation Plan Update Process
Mitigation Action Summary Worksheet

Strategy for Future Development	
Potential Funding	
Cost Estimate (Values from "Measuring Costs" fields from Benefit and Cost Review Worksheet)	
Benefits (Statements from the "Difference" fields on the Benefit and Cost Review Worksheet)	
Timeline	
Priority (Based off Priority worksheet)	



Hays County Hazard Mitigation Plan, City of Wimberley Annex

Table WB.13, Mitigation Action Prioritization (with Hazards in order of highest priority to lowest)

Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community	Risk Ranking Score	Total Score
12. Paradise Hills (Emergency Exit)	1	1	1	1	1	1	1	1	1	1	99	109
28. Evacuation Plans/Alternate road consideration	1	1	1	1	1	1	1	1	1	1	99	109
23. Increase Public Awareness of Hazard Mitigation	1	1	1	1	1	1	1	1	1	0	99	108
1. FM 1492 @ Blanco River	1	0	1	1	1	1	1	1	0	1	99	107
7. Wilson Creek @ River Road	1	0	1	1	1	1	1	1	0	0	99	106
10. Spoke Hollow Dr. @ Spoke Pile Creek	1	0	1	1	1	1	1	1	0	0	99	106
15. Hoots Holler	1	0	1	1	1	1	1	1	0	0	99	106
16. Emergency Siren System	1	0	1	1	1	1	1	1	0	0	99	106
18. Acquisition or elevation of Repetitive Loss Properties	1	1	1	0	1	1	0	1	1	0	99	106
19. Adopt Higher Standards for Flood Damage Prevention Ordinance	1	1	1	0	1	1	1	1	0	0	99	106
20. Attend Advanced Local Floodplain Management Courses to receive certification	1	1	1	1	1	1	0	1	0	0	99	106
24. Adopt wildfire maps from Hays County Firewise project	1	1	1	1	1	1	1	1	1	1	96	106
3. Little Arkansas @ Blanco River	1	0	1	0	1	1	0	1	0	1	99	105
4. Valley Drive @ Pierce Creek	1	0	1	1	1	1	0	1	0	0	99	105
5. Flite Acres Road	1	0	1	0	1	1	1	1	0	0	99	105
14. Little Ranches @ Panther Creek	1	0	1	0	1	1	1	1	0	0	99	105
21. Improve emergency communication/ warning systems	1	0	1	1	1	0	0	1	1	0	99	105
25. Coordination of marketing Large Item Pick-up day for Wildfire Mitigation	1	1	1	1	1	1	1	1	1	0	96	105
33. Restriction on development along Blanco River	1	1	1	0	1	1	1	1	-1	0	99	105



Hays County Hazard Mitigation Plan, City of Wimberley Annex

Table WB.13, Mitigation Action Prioritization (with Hazards in order of highest priority to lowest)

Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community	Risk Ranking Score	Total Score
6. FM 1492 @ Pierce Creek	0	0	1	1	1	1	0	1	0	0	99	104
8. Green Acres Dr. @ Fire Station	1	0	1	0	1	1	0	1	0	0	99	104
9. Leveritts Loop	1	0	1	0	1	1	0	1	0	0	99	104
11. River Road @ Western City Limits	1	0	1	0	1	1	0	1	0	0	99	104
13. River Road	0	0	1	1	1	1	0	0	0	0	99	103
17. Promote Flood Insurance in the community (previously action 27 from 2011 plan, modified)	0	0	1	1	0	0	1	1	0	0	99	103
22. Storm Ready Designation from National Weather Service	1	1	1	1	1	0	1	1	1	0	95	103
32. Windstrap requirement on temporary structures	1	1	1	1	1	1	0	1	0	0	95	102
30. De-icing Contract Research/ Plan Development	1	0	1	1	1	1	1	1	0	0	89	96
31. Develop water use public awareness campaign to ensure water for firefighting, provision of drinking water and reduction of groundwater depletion	0	0	1	1	1	1	0	1	0	0	75	80
34. Enhance Water Conservation Ordinance	0	0	1	1	1	1	0	1	0	0	75	80
26. Drought Monitoring Program	1	1	1	1	1	1	1	1	1	1	1	75
29. Soil Compaction Recommendation	0	1	1	0	1	1	0	1	0	0	48	53
27. Watershed Review Tour for Private Dams	1	1	0	0	1	0	0	1	0	0	36	40
35. Seismic Building Code Provisions	0	0	1	0	1	1	0	0	0	0	33	36
2. Hidden Valley @ Blanco River Already in progress- NOT RANKED												0



Hays County Hazard Mitigation Plan, City of Wimberley Annex

Mitigation Actions by Hazard

The mitigation actions in Table WB.14 are shown with the corresponding hazards.

Table WB.14, Mitigation Action Impact, City of Wimberley

Action Number	Drought	Extreme Heat	Severe Winter Storms	Lightning	Hailstorms	Windstorms	Tornadoes	Expansive Soils	Floods	Land Subsidence	Hurricanes/Tropical Storms	Earthquakes	Dam/ Levee Failure	Wildfire
1									X					
2									X					
3									X					
4									X					
5									X					
6									X					
7									X					
8									X					
9									X					
10									X					
11									X					
12									X					
13									X					
14									X					
15									X					
16		X	X	X	X	X	X		X		X	X	X	X
17									X					
18									X					
19									X					
20									X					
21		X	X	X	X	X	X		X		X	X	X	X
22			X	X	X	X	X		X		X			
23	X	X	X	X	X	X	X	X	X		X	X	X	X
24														X
25				X		X	X							X
26	X													
27									X				X	
28									X		X		X	X
29								X						
30			X											
31	X													
32			X			X	X				X			
33									X					
34	X													
35												X		



3.6 Integration Efforts

Table WB.15 captures ways that the HMP risk assessment, mitigation goals and actions can be integrated into other City of Wimberley documents, programs and regulations.

Table WB.15, Plan Integration Efforts, City of Wimberley

Name of Document	Type	Item Type	Process for Integration
Capital Improvements Plan (future)	Plan	Actions	In the event that the new City Administrator should develop a CIP, actions 1- 18 could be integrated as actions that would mitigate loss of life and property. These actions would be approved by the City Council and if possible, funds would be obligated for the projects.
City of Wimberley Code of Ordinances	Regulations	Actions	Actions 19, 32, 33, 34 and 35 should be incorporated into existing ordinances in order to increase the level of protection instituted into the construction of new structures. Those ordinance amendments would be presented to the City Council for approval, and if passed, would be administered through responsible city agencies.
HaysInformed.com	Program	Action	Coordinate with website administrator to post link to existing Hays County HaysInformed.com emergency preparedness/awareness page when creating Public Awareness Page for hazards on Wimberley website (Action 6).
Blue Hole Park			Utilize this popular tourist attraction to help further encourage water conservation and protection through guided tours that emphasize the importance of natural water systems (Action 31).
Hazard Mitigation Grant Program (HMGP)	Funding	Action	Identify actions that can be funded through new and existing grant awards. Review existing mitigation actions for eligibility for the grant program, to include Benefit Cost consideration. Prepare grant application documents in advance to prepare for future grant application periods. Process involves identification of actions from Plan; obtaining Council approval to apply; notification of interest in grant to the public; completion of application for funding; if awarded, obtaining Council approval to accept; if accepted, administration of funds and implementation of project.
Pre-Disaster Mitigation (PDM)			
Flood Mitigation Assistance (FMA)			
TWDB Flood Protection Planning (FPP) Grant			



Hays County Hazard Mitigation Plan, City of Wimberley Annex

Table WB.15, Plan Integration Efforts, City of Wimberley

Name of Document	Type	Item Type	Process for Integration
TWDB Clean Water State Revolving Fund (CWSRF)	Funding	Action	Identify actions that can be funded through new and existing loan programs. Review existing mitigation actions for eligibility for the grant program, to include Benefit Cost consideration. Prepare loan application documents in advance to prepare for future loan application periods.
Texas Water Development Fund (DFund)			Process involves obtaining Council approval to apply; notification of interest in loan to the public; completion of application for loan; if awarded, obtaining Council approval to accept; if accepted, administration of funds and implementation of project.

Incorporation Achievements Since Previous Plan Update

The City of Wimberley incorporated the HMP into other planning mechanisms as a demonstration of progress in local hazard mitigation efforts. This was achieved by identifying MPC planners and or stakeholders to participate in the creation of the 2016 Comprehensive Plan.



Section 4: Finalize Plan Update (Review, Evaluation, and Implementation)

4.1 Changes in Development

The City of Wimberley continues to be a growing tourist destination. As the community works hard to control the growth and ensure that it is done in a safe manner, they are faced by the ever-increasing influx of citizens in Hays County as a result of both residential growth and increasing transient populations.

Other changes in development include a State of recovery for the small community. After millions of dollars in flood damages over the past 5 years, the community is attempting to place mitigation in the forefront as it is a priority in saving future structures and most importantly, protecting lives. This process decreases vulnerability through the incorporation of mitigation in the reconstruction process.

4.2 Progress in Mitigation Efforts

Past Mitigation Action Progress Reports Summary - Completed and Canceled

2011 Action Number	Hazard	Item Description	Lead Department
23	All hazards	Development of and maintenance of Countywide and individual community HAZMAP Plans	City of Wimberley
Cost Estimate/Funding		Schedule	Status as of 2017
Existing Staff resources		Original Plan adopted on 4/20/2004. Update in 2011	Completed.
Cost Effectiveness			
Not independently cost-effective			

2011 Action Number	Hazard	Item Description	Lead Department
25	Extreme Heat	Reduce Impacts of Extreme Heat on Elderly, Disabled, Low-Income and Infants (Fan Distribution Program)	Wimberley and Local ESD
Cost Estimate/Funding		Schedule	Status as of 2017
\$2,000 to purchase and distribute 100 box fans and \$3,000 estimated cost for a/c repairs Funding Sources: United Way, Rotary Clubs, Lion Clubs, Red Cross, Churches and charitable organizations, power companies		Periods of Extreme Heat May be annually	Canceled. This project is not one that would benefit a large number of citizens in Wimberley. This was replaced with an awareness action.
Cost Effectiveness			
Not independently cost-effective			



Hays County Hazard Mitigation Plan, City of Wimberley Annex

2011 Action Number	Hazard	Item Description	Lead Department
31	Extreme Heat	Evaluate Excess Heat Risks. Study.	Wimberley
Cost Estimate/Funding		Schedule	Status as of 2017
No additional cost- uses Existing Staff resources		TBD; probably initiated in 2011	Canceled. Flood priorities outweighed the effects of Extreme Heat in the community.
Cost Effectiveness			
Not independently cost-effective, but needed to develop adequate risk reduction efforts			

2011 Action Number	Hazard	Item Description	Lead Department
35	Floods, thunderstorms, high winds, tornadoes, seismic	Structural/Engineering Study of Wimberley facilities	City of Wimberley
Cost Estimate/Funding		Schedule	Status as of 2017
TBD, but if initiated probably from General Fund		Not yet established- to be commenced only if funding is available	Canceled. Not an outstanding priority during the planning period.
Cost Effectiveness			
Not independently cost-effective, but the initial step in identifying appropriate mitigation actions			

4.3 Changes in Priorities

Plan-level priority changes are reflected in the changes to the plan-level goals shown in Chapter 3: Mitigation Strategy within the Main Plan document.

The community is undergoing a change in management with a new City Administrator. With this may come changes in priorities of regulation, spending and development. Plan updates should include information regarding the vision of the new City management once a replacement is known.



Section 5: Approval and Adoption

5.1 Approval and Adoption Procedure

The procedures for approval and adoption are described in Chapter 4.1 of the main plan document.

Table WB.16, Municipal Jurisdiction Adoption Date

Municipality	APA Date	Adoption Date
City of Wimberley		

Approval and Adoption





Jurisdiction Adoption Documentation Placeholder

References

- American Legal Publishing . (2000, 12 21). Wimberley, TX Code of Ordinances. Retrieved from Chapter 35: Fee Schedule : [http://library.amlegal.com/nxt/gateway.dll/Texas/wimberley_tx/cityofwimberleytexascodeofordinances?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:wimberley_tx](http://library.amlegal.com/nxt/gateway.dll/Texas/wimberley_tx/cityofwimberleytexascodeofordinances?f=templates$fn=default.htm$3.0$vid=amlegal:wimberley_tx)
- American Legal Publishing Corporation. (2001, 02 15). Wimberley, TX Code of Ordinances. Retrieved from Chapter 151: Building Regulations; Construction: [http://library.amlegal.com/nxt/gateway.dll/Texas/wimberley_tx/cityofwimberleytexascodeofordinances?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:wimberley_tx](http://library.amlegal.com/nxt/gateway.dll/Texas/wimberley_tx/cityofwimberleytexascodeofordinances?f=templates$fn=default.htm$3.0$vid=amlegal:wimberley_tx)
- American Legal Publishing Corporation. (2001, 09 20). Wimberley, TX Code of Ordinances. Retrieved from Chapter 153: Flood Damage Prevention : [http://library.amlegal.com/nxt/gateway.dll/Texas/wimberley_tx/cityofwimberleytexascodeofordinances?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:wimberley_tx](http://library.amlegal.com/nxt/gateway.dll/Texas/wimberley_tx/cityofwimberleytexascodeofordinances?f=templates$fn=default.htm$3.0$vid=amlegal:wimberley_tx)
- American Legal Publishing Corporation. (2001, 09 20). Wimberley, TX Code of Ordinances. Retrieved from Chapter 154: Subdivision Control: [http://library.amlegal.com/nxt/gateway.dll/Texas/wimberley_tx/cityofwimberleytexascodeofordinances?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:wimberley_tx](http://library.amlegal.com/nxt/gateway.dll/Texas/wimberley_tx/cityofwimberleytexascodeofordinances?f=templates$fn=default.htm$3.0$vid=amlegal:wimberley_tx)
- American Legal Publishing Corporation. (2003, 11 20). Wimberley, TX Code of Ordinances. Retrieved from Chapter 32: Emergency Management: [http://library.amlegal.com/nxt/gateway.dll/Texas/wimberley_tx/cityofwimberleytexascodeofordinances?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:wimberley_tx](http://library.amlegal.com/nxt/gateway.dll/Texas/wimberley_tx/cityofwimberleytexascodeofordinances?f=templates$fn=default.htm$3.0$vid=amlegal:wimberley_tx)
- American Legal Publishing Corporation. (2005). Wimberley, TX Code of Ordinances. Retrieved from Chapter 92: Open Burning : [http://library.amlegal.com/nxt/gateway.dll/Texas/wimberley_tx/cityofwimberleytexascodeofordinances?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:wimberley_tx](http://library.amlegal.com/nxt/gateway.dll/Texas/wimberley_tx/cityofwimberleytexascodeofordinances?f=templates$fn=default.htm$3.0$vid=amlegal:wimberley_tx)
- City of Wimberley. (2007, 08 02). Maps, Records & Archives. Retrieved from Master Plans & Strategies: Transportation Master Plan: <http://www.cityofwimberley.com/vertical/sites/%7B140989A8-309D-4E90-A37A-F257BF123B26%7D/uploads/%7B466732EA-4F29-4300-8A72-C8CE25C24401%7D.PDF>
- City of Wimberley. (2008, 11 06). Maps, Records & Archives. Retrieved from Master Plans & Strategies: Economic Development Strategy : <http://www.cityofwimberley.com/vertical/sites/%7B140989A8-309D-4E90-A37A-F257BF123B26%7D/uploads/%7B67AC0D76-A382-4867-8ADE-7BAF7737D5F5%7D.PDF>
- City of Wimberley. (2008, 11). Maps, Records & Archives. Retrieved from Master Plans & Strategies: Parks Master Plan : <http://www.cityofwimberley.com/vertical/sites/%7B140989A8-309D-4E90-A37A-F257BF123B26%7D/uploads/%7BE6E2A1F4-2D06-4BA4-9169-E75FA001F429%7D.PDF>
- City of Wimberley. (2016, 02 04). Maps, Records & Archives. Retrieved from Master Plans & Strategies: Comprehensive Plan: http://www.cityofwimberley.com/vertical/sites/%7B140989A8-309D-4E90-A37A-F257BF123B26%7D/uploads/Comprehensive_Plan.Amended_2.4.16.pdf
- City of Wimberley. (2017, 03 20). Building Permits. Retrieved from Residential Application: http://www.cityofwimberley.com/vertical/sites/%7B140989A8-309D-4E90-A37A-F257BF123B26%7D/uploads/Residential_Bldg_Permit_Rev_06-15.pdf
- National Fire Protection Association. (2013, June). NFPA News & Research. Retrieved from Lightning Fires and Lightning Strikes: <http://www.nfpa.org/news-and-research/fire-statistics-and-reports/fire-statistics/fire-causes/lightning-fires-and-lightning-strikes>
- National Highway Traffic Safety Administration. (2017, 03 11). Traffic Safety Facts. Retrieved from Texas 2011-2015: <https://cdan.nhtsa.gov/SASStoredProcess/guest>

- National Oceanic and Atmospheric Administration. (2016). Historical Hurricane Tracks. Retrieved from National Oceanic and Atmospheric Administration Coastal Management: <https://coast.noaa.gov/hurricanes/>
- National Oceanic and Atmospheric Administration Storm Event Database. (2016, 12 01). National Centers for Environmental Information. Retrieved from Data Access: <https://www.ncdc.noaa.gov/data-access>
- Texas A&M Forest Service. (2016, 12 01). Wildfire Risk Assessment Portal. Retrieved from Public Viewer: <https://www.texaswildfirerisk.com/>
- Texas Department of Transportation. (2017, 03 11). Crash Records Information System. Retrieved from C.R.I.S Query: <https://cris.dot.state.tx.us/public/Query/#/public/welcome>
- Texas Natural Resources Information System. (2011). TNRIS Data Catalog Low Water Crossings. Retrieved from TNRIS: <https://tnris.org/data-catalog>
- USGS Earthquake Hazard Program. (2015). USGS Earthquake Hazard Program. Retrieved from USGS: <https://earthquake.usgs.gov/data/>



The City of
Woodcreek
IN THE MIDST OF THE TEXAS HILL COUNTRY

City of Woodcreek
Hays County Hazard
Mitigation Plan Update
2018



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City of Woodcreek Annex

Section 1: Organize and Review

This section contains a brief description of the City of Woodcreek and its jurisdictional features. In addition, Section 1 contains the following details regarding Woodcreek's:

- participation in the Hays County HMP Update process,
- stakeholder engagement,
- public outreach strategy,
- incorporation efforts, and
- plan maintenance procedures.

*Population :	1,542
Size of Community:	1.27 sq. miles
*Population over 65 years old	549
*Population under 16 years old	243
*Economically Disadvantaged Population (\$0-\$20k)	102

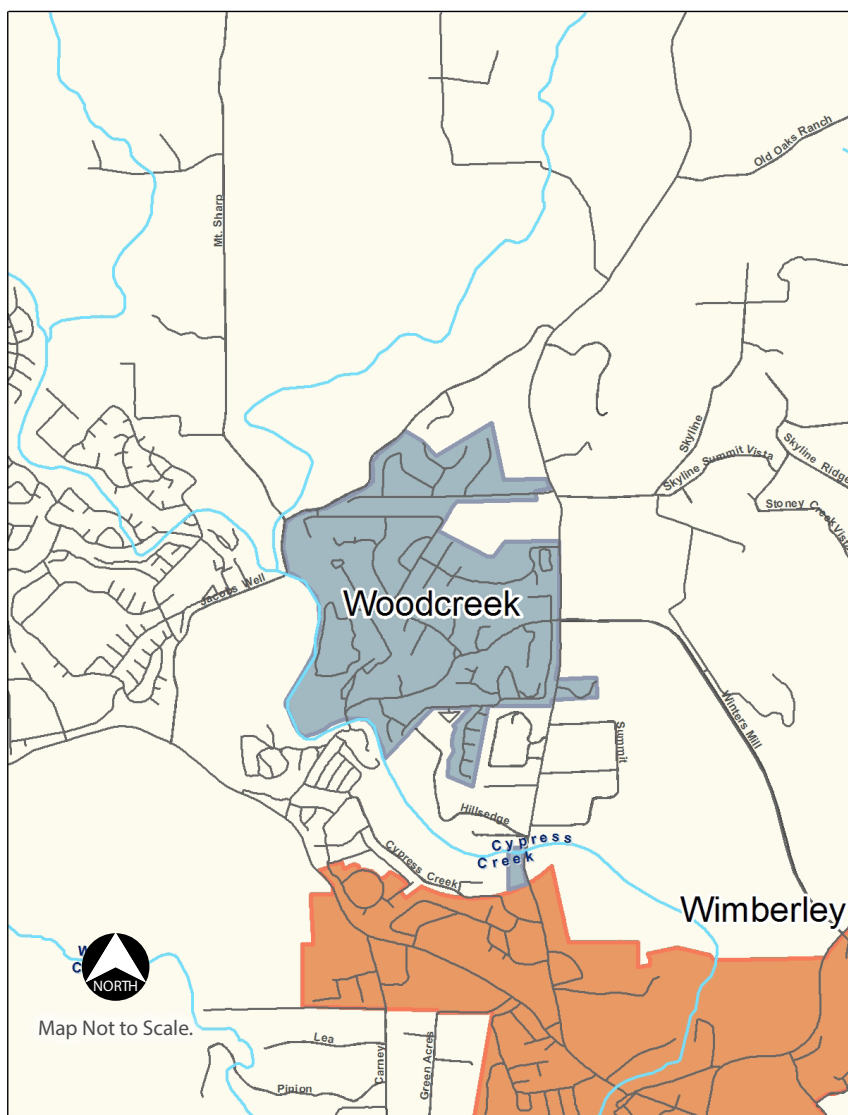
Woodcreek is serviced by the following responders:

Fire/EMS - Wimberley Fire/Wimberley EMS

Law Enforcement - Hays County Sheriff's Office/Precinct 3
Constable's Office for Hays County

HAZUS-MH 3.2 Updated Census 2010 Population Estimates

Figure WC.1, City of Woodcreek



1.1 Community Description

When planning, it is important to take into account the characteristics that make a community unique. Consideration of unique needs when it comes to mitigating or recovering from natural hazards ensures that all members of the community and their needs are addressed.

The City of Woodcreek is a small community surrounded by creeks, situated on 696 acres of land, with much of the acreage devoted to the community golf course. There are 100 lots open for development and a 72-unit apartment complex that is opening its first unit in 2017. An average of 10 new homes are built per year.

The City is made up of several (but not all) phases of the Woodcreek subdivision. The City of Woodcreek incorporated in 1984 and according to City staff, "enjoys a low tax rate and high quality of life."

The community has a Master Plan that was adopted as a 10-year plan to reconstruct the 10 miles of streets within the City limits.

Hays County Hazard Mitigation Plan, City of Woodcreek Annex

Industry in the community includes a Golf Course, and a youth camp called Camp Young Judaea. These 2 recreational attractions, along with a liquor store, account for most of the sales tax revenue for the community (shown in Table WC.1). Woodcreek's main utility providers are shown in Table WC.2.

Woodcreek's students are served by Wimberley Independent School District (ISD). The City is governed as a Type A-General Law community, with a Mayor and 5 City Council Members.

Table WC.1, Major Employers

Business Type	Name of Employer
Recreational	Camp Young Judaea
Recreation	Quick Sand Golf Course
Retail	Hill Country Spirits

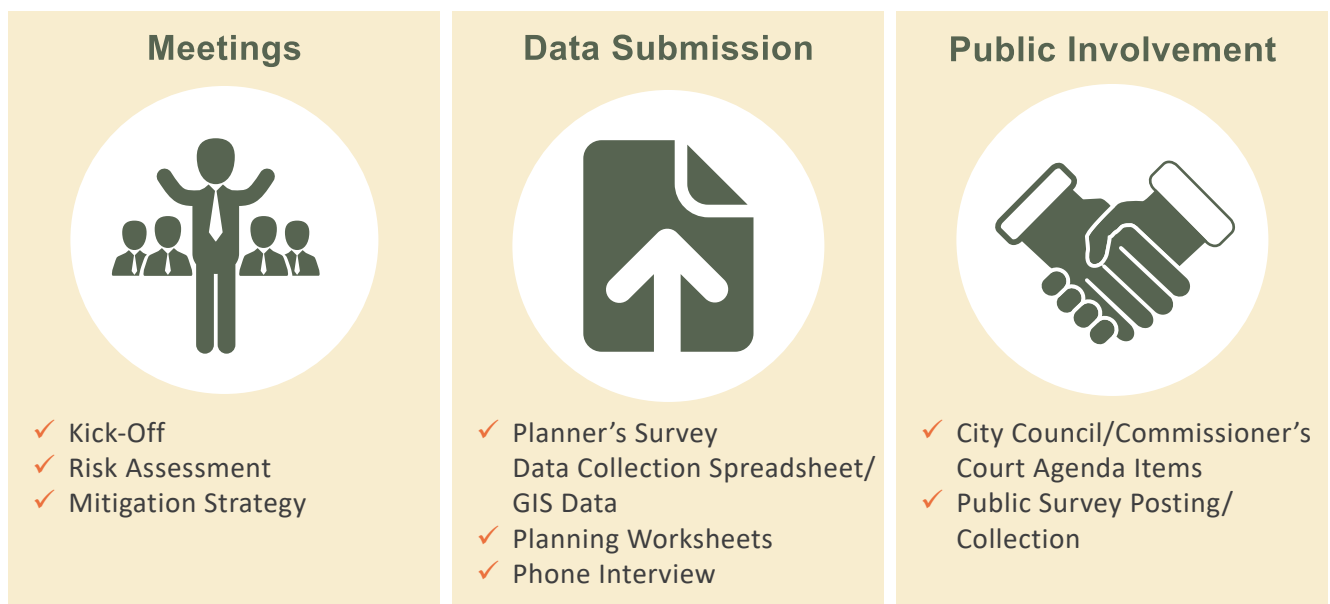
Table WC.2, Utility Providers

Type	Provider
Electric	Pedernales Electric Cooperative (PEC)
Water	Aqua Texas

Community Planning Involvement

MPC planning activities for the Hays County Hazard Mitigation Plan (HMP) Update are captured in Figure WC.2, which utilizes check-marks to indicate each of the activities that were completed by Woodcreek MPC members.

Figure WC.2, City of Woodcreek Plan Participation





1.2 Outreach Strategy

The City of Woodcreek was very active in the following outreach activities used to request public participation in the Hays County HMP Update. Their activities included promotion of the HMP Public Survey, a City Council announcement, plan phase newsletter distribution and a draft plan public comment period.

Public Survey Promotion

Woodcreek advertised the Hays County HMP Update Public Survey on the homepage of www.woodcreektx.gov. In addition, an email requesting survey completion was sent to all people enrolled for Woodcreek notifications and text messaging.

As of March 10, 2017, 63 Woodcreek residents responded to the public survey. Survey data was directly incorporated into the risk ranking process for hazards and mitigation actions. Details regarding the incorporation of the survey results is included in Chapter 2, the risk assessment portion of the main plan document.

City Council Announcement

On December 14, 2016, the Woodcreek City Manager presented information regarding the Hays County HMP Update to the Woodcreek City Council. Elected officials, local agency leaders and members of the public attended the meeting. The council agenda for this report is included in Plan Appendix A.

Plan Phase Newsletters

Woodcreek MPC utilized newsletters for each phase of the planning process in order to share updates on the planning process with stakeholders, elected officials, City staff and the public. Copies of the newsletters can be found in Plan Appendix A.

Plan Draft Public Review and Comment Period

The link to the draft Hays County HMP Update was posted on the City of Woodcreek website from July 12, 2017 until July 26, 2017. A hard copy was placed in the Woodcreek City Hall for public review. No public comments were received during this review period.

1.3 Incorporation of Sources

In addition to stakeholder and public input, the MPC also reviewed other City planning resources that could provide useful information for the plan update process. Table WC.3 lists the documents reviewed and how they were considered for incorporation in the updated plan.

Table WC.3, Sources Reviewed for Incorporation

Name of Document	Type	Considerations for Incorporation
2013 State of Texas HMP	Plan	Utilized hazard definitions and hazard classification names.
Flood Insurance Study	Study	Incorporated best available hydraulic and hydrological study results for flood hazard profile.
City of Woodcreek, Texas Code of Ordinances	Regulations	Reviewed Ordinances for possible mitigation enhancement. (Detailed in Section 3: Mitigation Strategy- Existing Sources) (American Legal Publishing Corporation, 2016)



Table WC.3, Sources Reviewed for Incorporation (cont.)

Name of Document	Type	Considerations for Incorporation
City of Woodcreek 2020 Vision Master Plan	Plan	<p>Reviewed plan for actions and goals to incorporate:</p> <ul style="list-style-type: none"> • Goal 1- Action 6- Develop a plan to control water runoff (street gutters, curbs, and holding pond areas). • Goal 4- Action 5- Establish engineering specifications for street improvements and new construction, including drainage, runoff management, and water quality. • Goal 4- Action 6- Following the completion of the flood plan study, identify flood-prone street sections and develop strategies to minimize or eliminate these problems. • Goal 5- Action 9- Review, revise and adopt ordinances for management of water runoff and quality. • Goal 5- Action 15- Review, revise and adopt ordinances for impervious cover standards. • Goal 6- Action 1- Clear and maintain all creek beds, water ways, and any drainage ditches or structures. • Goal 6- Action 4- Aggressively seek donations of open space areas. • Goal 6- Action 7- Adopt an ordinance establishing time-limits for clean up and removal of debris following fires, floods or storms. • Goal 9- Action 8- Explore new technologies for increased communication within the community.



Section 2: Risk Assessment

City of Woodcreek Jurisdictional Hazards

This section contains Woodcreek's hazard profiles for each natural hazard included in the Hays County HMP Update. Profiles include:

- Location - the area where the hazard is known to occur
- Previous Occurrences - a history of reported events for the hazard
- Significant Previous Occurrences (when applicable) - notable hazard events within the community
- Extent - the strength or magnitude of the hazard
- Probability - the likelihood of the hazard event occurring in the future
- Impact - the consequence or effect (or possible effect) of hazard events
- Vulnerability Summary - identification of structures, systems, populations or assets susceptible to loss or damage.

Hazard descriptions and extent scales for hazard magnitudes, are found in Chapter 2, the risk assessment portion of the main plan document.

When available, data specific to Woodcreek was used for hazard analysis. When no instances were reported specifically for the jurisdiction for regional hazards, County-wide data was applied.

State and national datasets were used to determine occurrence, extent, and the respective probabilities, rather than verbal testimonies, in an effort to retain data consistency. For some hazards, the National Oceanic and Atmospheric Administration (NOAA) Storm Events Database was used as the most comprehensive data available for hazards. The Storm Events Database does not always reflect the most recent totals for fatality, injury and damage amounts shown for previous hazard occurrences. The Previous Occurrences paragraphs identify instances in which this may occur. Verbal testimony, when available, was integrated into impact or vulnerability summaries to account for updates in this data.

2.1 Hazard Profiles

Hazards profiled within the Risk Assessment include:

- Drought - Within Chapter 2, the risk assessment portion of the main plan document.
- Extreme Heat - Within Chapter 2, the risk assessment portion of the main plan document.
- Severe Winter Storms - Within Chapter 2, the risk assessment portion of the main plan document.
- Lightning - Within Chapter 2, the risk assessment portion of the main plan document.
- Hailstorms
- Windstorms
- Tornadoes
- Expansive Soils
- Floods
- Hurricanes/Tropical Storms
- Earthquakes
- Dam/Levee Failure
- Wildfires

Hailstorms



Hailstorms: Location

The entire extent of the City of Woodcreek is exposed to some degree of hail hazard. Since hail can occur at any location, hail events could be experienced anywhere within the jurisdiction.

Hailstorms: Previous Occurrences

Although not recorded in the NOAA Storm Events database, community testimony indicates that a hail event occurred within the City of Woodcreek on April 30, 2016 causing wide-spread damage to homes and vehicles totaling over \$3,000,000 in damages. Without additional data available for calculations, County-wide data was utilized for calculating extent and probability.

Hailstorms: Extent and Probability

The Tornado and Storm Research Organization (TORRO) created a hail extent index to measure hail called the Hailstorm Intensity Scale. According to the reported previous hail occurrences for the planning area, the maximum hail extent experienced was up to 3 inches or 76.20 millimeters in diameter. This size corresponds to a TORRO Hailstorm Intensity Scale classification of a “Super Hailstorm.” Refer to Chapter 2, the risk assessment portion of the main plan document, for hail extent scale descriptions.

Based on 57 reported events in 49 years, a hail event occurs in Hays County approximately once a year, on average. Since hail events can happen anywhere throughout the HMP update area, the City of Woodcreek’s future probability is assumed to be similar to the surrounding County area. The City can expect a hail event approximately once every year on average in the future, with hail up to 3 inches, or 76.20 millimeters in diameter, corresponding to a TORRO Hailstorm Intensity Scale classification of a “Super Hailstorm.”

Hailstorms: Impact

Community testimony indicates that hail damage does cause property damage in the community. Based on the maximum hail extent experienced (76.20 mm) in the surrounding County area, the TORRO Hailstorm Intensity Scale indicates that impact can be expected to include any of the following:

- Varying degrees of damage to vegetation and crops
- Damage to plastic structures
- Varying degrees of damage to glass
- Paint and wood scored
- Vehicle bodywork damage
- Varying degrees of roof damage
- Varying degrees of risk of injuries
- Varying degrees of aircraft damage
- Brick walls pitted
- Risk of severe or even fatal injuries to persons caught in the open

Hailstorms: Vulnerability Summary

In Woodcreek, the residential structures face the greatest vulnerability to hailstorms. Their roofs are vulnerable to damage and can also leave residents with large amounts of water damage as a secondary impact. In addition, Woodcreek City Hall is vulnerable to hail damage, as it is not retrofitted against the impacts and is the only building utilized for the administration of City business.





Windstorms

Windstorms: Location

The entire extent of the City of Woodcreek is exposed to some degree of wind hazard. Since wind can occur at any location, wind events could be experienced anywhere within the jurisdiction.

Windstorms: Previous Occurrences

While the City of Woodcreek has not had any previous occurrences reported through the NOAA Storm Events Database, if an event were to occur, it would be similar in size and magnitude to events within the surrounding County area. There were 38 wind events reported for Hays County and its unincorporated jurisdictions since the year 1974. Community testimony accounts of damage, without specific dates and damage costs, are noted in the vulnerability summary section of this profile.

Windstorms: Significant Past Events

According to community testimony, on April 30, 2016 straight-line winds throughout the City of Woodcreek caused over \$10,000 in damages. The wind event caused roof damage, trees and large limbs to be knocked down, as well as road closures due to fallen debris.

Windstorms: Extent and Probability

Wind is measured by the Beaufort Wind Scale that relates wind speed to observed conditions on land and sea. According to the reported previous windstorm occurrences in the planning area, the maximum wind extent experienced was 70 knots windstorm occurrences in the jurisdiction, the maximum wind extent experienced was 70 knots (corresponding to Beaufort Wind Classification: Hurricane). Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of wind extent scales.

Based on 38 reported events in 42 years, a wind event occurs in Hays County approximately once every year, on average. Since wind events can happen anywhere throughout the HMP planning area, the City of Woodcreek's future probability is assumed to be similar to the surrounding County area. In the future, the City's probability for a wind event of up to 70 knots (Beaufort Wind Classification: Hurricane) is approximately once every year (on average).

Windstorms: Impact

Community testimony indicates that past wind events have created debris in the roadway. Although there were no reports specifically for the City of Woodcreek from the NOAA database, data available from the Texas Department of Transportation's Crash Records Information System shows that between the years of 2010 and 2017, rural Hays County experienced 5 crashes related to severe crosswind weather conditions. There were no injuries reported from these crash events (see Table WC.4). Since wind events occur on a regional scale, it is assumed that weather related crashes in the surrounding County area would be similar to those experienced in these conditions within Woodcreek.



Hays County Hazard Mitigation Plan, City of Woodcreek Annex

Table WC.4, Windstorms, Vehicle Accidents, Hays County

City	Fatality	Incapacitating Injury	Non-Incapacitating Injury	Possible Injury	Crash Year	Street Name	Surface Condition	Weather Condition
Rural Hays County	0	0	0	0	2010	LIME KILN RD	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2017	US0290	Wet	Severe Crosswinds

(Texas Department of Transportation, 2017)

Structures can be damaged by flying debris and impact from severe winds, damaging rooftops and causing other structural damage.

Critical infrastructure, such as utility poles and street signals, could also be disrupted, impacting all residents in the affected area. Debris on the roadway can also cause obstruction for emergency responders' ability to provide services.

Windstorms: Vulnerability Summary

Woodcreek has previously experienced debris accumulation on roadways during windstorm events. Such incidents could impede public safety officials' access to residences for emergency response. Dangerous road conditions also pose a threat to members of the community traveling to or from home. Woodcreek's entire electrical distribution system is subsurface, which eliminates a vulnerability to impact from high winds that can damage power lines.

Additionally, Woodcreek City Hall is not retrofitted to mitigate damages caused by extreme winds. Damage to the structure could lead to delays in getting assistance for members of the community.





Tornadoes

Tornadoes: Location

The entire extent of the City of Woodcreek is exposed to some degree of tornado hazard. Since tornadoes can occur at any location, tornado events could be experienced anywhere within the jurisdiction.

Tornadoes: Previous Occurrences

While the City of Woodcreek has not had any previous occurrences reported through the NOAA Storm Events Database, if an event were to occur, the event would be similar in size and magnitude to events within the surrounding County area. Table WC.5 lists the 16 tornado events reported for Hays County and its unincorporated jurisdictions since year 1953.

Fatality, injury and damage amounts are shown in Table WC.5, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table WC.5, Tornado Events, Hays County

Location	Date	Type	Extent	Fatalities	Injuries	Property Damage	Crop Damage
Hays County	4/28/1953	Tornado	F3	1	5	250,000.00	0.00
Hays County	4/30/1954	Tornado	F1	0	0	250,000.00	0.00
Hays County	5/2/1958	Tornado	F1	0	0	30.00	0.00
Hays County	11/12/1961	Tornado	F2	0	0	2,500.00	0.00
Hays County	9/20/1967	Tornado	NA	0	0	250.00	0.00
Hays County	9/20/1967	Tornado	NA	0	0	30.00	0.00
Hays County	5/10/1975	Tornado	F1	0	0	25,000.00	0.00
Hays County	3/30/1976	Tornado	F2	0	0	25,000.00	0.00
Hays County	3/30/1976	Tornado	F2	0	1	250,000.00	0.00
Hays County	8/10/1980	Tornado	F2	0	0	25,000,000.00	0.00
Hays County	4/22/1985	Tornado	F2	0	0	250,000.00	0.00
Hays County	8/22/1991	Tornado	F1	0	0	2,500.00	0.00
Countywide	5/13/1994	Tornado	F0	0	0	500.00	500.00
Henly	11/15/2001	Tornado	F0	0	1	50,000.00	0.00
Driftwood	10/8/2002	Tornado	F0	0	0	70,000.00	0.00
M. Gainor	5/23/2015	Tornado	EF0	0	0	0.00	0.00
Total				1	7	\$26,175,810.00	\$500.00

(National Oceanic and Atmospheric Administration Storm Events Database, 2016)

Tornadoes: Extent and Probability

Tornadoes are measured by severity on the Fujita and Enhanced Fujita Scales, with a range from 0-6. According to the reported previous tornado occurrences in the jurisdiction, the maximum tornado extent experienced was a category F3 tornado in 1953.

Based on 16 reported events in 63 years, a tornado event occurs approximately every 4 years on average in Hays County. City of Woodcreek's future probability is assumed to be similar to the surrounding County area. The City's probability of a tornado event approximately once every 4 years (on average) in the future, with up to an F3 magnitude.





Tornadoes: Impact

There is no specific event data available for the City of Woodcreek, from which impacts would be calculated. However, it can be assumed that impacts would be similar to those that the surrounding County area experiences.

Based on Hays County having experienced tornadoes between F0 and F3 levels in the past, if similar events were to happen in the future in the City, the type of impacts that the jurisdiction can expect associated with those magnitudes would include, from least to greatest:

- Light Damage - Broken branches; shallow rooted trees pushed over; some chimney damage.
- Moderate Damage - Surface damage to roofs; mobile homes pushed off foundation; moving vehicles pushed off the road.
- Significant Damage - Frame houses have roof torn off; mobile homes completely destroyed; train boxcars overturned; large trees snapped or uprooted; smaller debris turned into missiles.
- Severe Damage - Roofs completely torn off well-constructed buildings, along with some walls; majority of trees uprooted; trains overturned; vehicles lifted off the ground.

(Tornado Facts, 2016)

Structures can be damaged by flying debris and impact from tornado winds, damaging rooftops and causing other structural damage.

Critical infrastructure, such as utility poles and street signals, could also be disrupted, impacting all residents in the affected area. Debris on the roadway can also cause obstruction for emergency responders' ability to provide services.

Tornadoes: Vulnerability Summary

Although Woodcreek has no manufactured or mobile homes that would be vulnerable to the effects of tornadoes, Camp Young Judaea uses cabins to house the young people that attend the camp. The tourists staying in these structures would not only face the structural risk, but may also lack knowledge of protective measures for sheltering during tornadoes.

While the community has a texting service and email tool that can be used to communicate emergency information to residents, the system is voluntary and requires self-registration. As a result, messages sent utilizing the system do not reach all residents. Residents are encouraged to sign up for emergency alerts through CAPCOG.

Woodcreek has previously experienced debris accumulation on roadways during windstorm events. Such incidents could impede public safety officials' access to residences for emergency response. This displays vulnerability as high winds and debris accompany tornado events.

Additionally, City of Woodcreek City Hall is not retrofitted to mitigate damages caused by the extreme winds that accompany tornadoes. Damage to the structure could lead to delays in getting assistance for members of the community.





Expansive Soils

Expansive Soils: Location

Figure 2.3 within Chapter 2 (the Risk Assessment portion within the Hays County HMP Update) shows the location of expansive soil areas for the City. The entire extent of the jurisdiction is classified as having less than 50 percent of the area underlain by soils with clays of high swelling potential, therefore all of the jurisdiction is equally at risk.

Expansive Soils: Previous Occurrences

There was no documentation of past site-specific events of structural damage due to expansive soils from local, State, or national databases queried.

Expansive soils cannot be documented as a time-specific event, except when they lead to structural and infrastructure damage. There are no specific damage reports or historical records of events in the City, however future events can occur.

Expansive Soils: Extent and Probability

Considering the amount of swelling potential within the jurisdiction, as well as the lack of reported events, the probability of a future event is low (0 - 1 occurrences in the next 10 years affecting less than 5 structures).

Expansive Soils: Impact

Expansive soils in Woodcreek have caused undocumented impacts to home foundations and terrain through minor cracking and separation. The damage, although inconsequential, would increase with natural conditions that result in increased soil swelling. Increased severity in weather and natural conditions lead to increased soil swelling, resulting in deeper and longer cracks in terrain and structure foundations, and possible structural shifting.

Expansive Soils: Vulnerability Summary

Areas within the City of Woodcreek are not readily experiencing new development. A portion of the residences were constructed when the community was not yet incorporated. Since building standards were not in place, it is possible that those structures could be impacted by expansive soils in the event of shrink-swell activity. While expansive soils do not account for many damages to structures or infrastructure yet, the impact may increase over time as alternating periods of drought and flood events continue. With less awareness of the risk, and less concern for the impact, there may be decreased attention to mitigation measures that could help residents protect their structures against the effects of expansive soils.





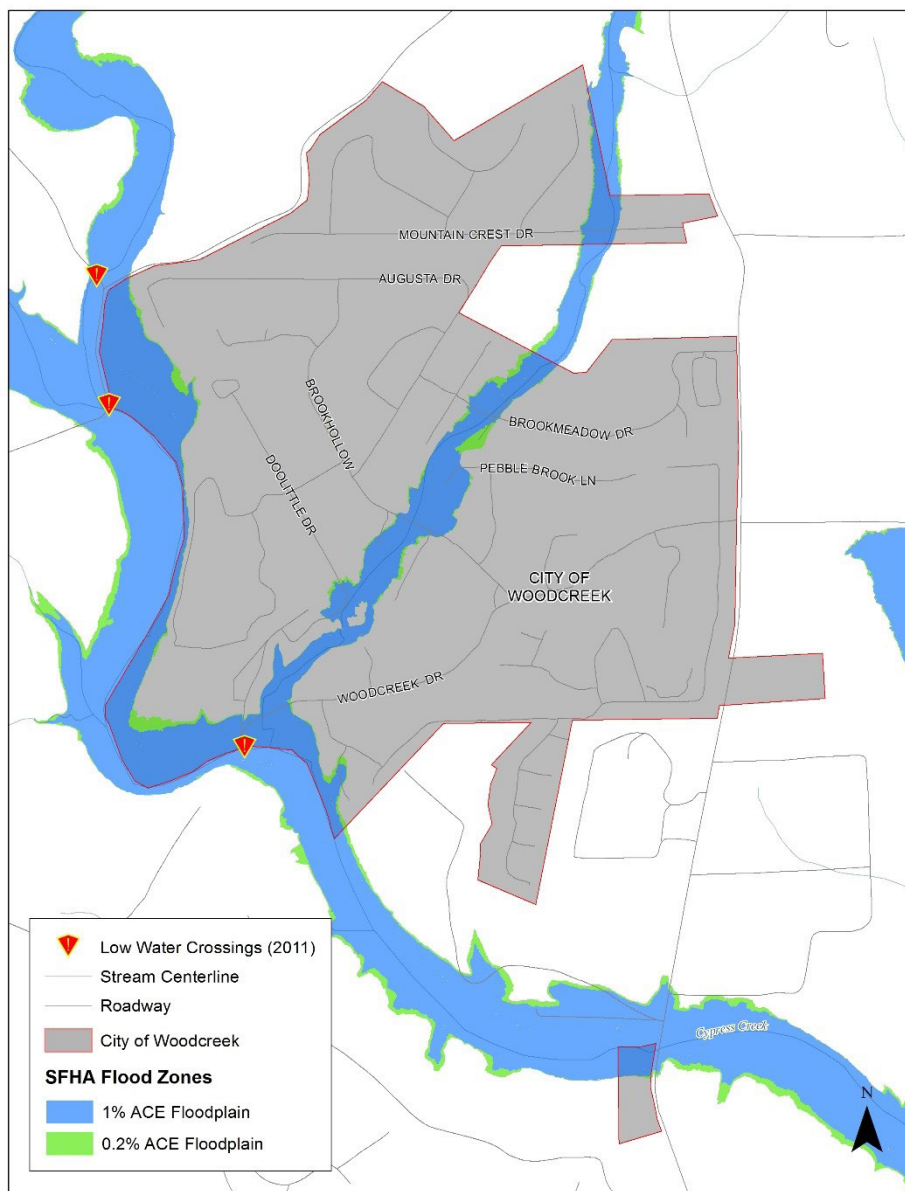
Floods

Floods: Location

The location of low water crossings, as well as the 1% (100 year) and 0.2% (500 year) Annual Chance Event (ACE) floodplains for the City of Woodcreek are shown in Figure WC.3. This figure represents the areas that are most affected by riverine flooding and is based upon newly developed hydrological and hydraulic analysis.

The new analysis is considered the best information available to date. Table WC.6 provides the total acreage in the jurisdiction that is located in the 1% and 0.2% floodplains.

Figure WC.3, Special Flood Hazard Areas and Low Water Crossings, City of Woodcreek



(Texas Natural Resources Information System, 2011)

Table WC.6, City of Woodcreek Floodplain Acreage

Jurisdiction	100yr (1%) Floodplain Acres (Includes Floodway)	500yr (0.2%) Floodplain Acres (Includes 100yr)
City of Woodcreek	92	101





Floods: Previous Occurrences

Hays County was included in 3 Federal disaster declarations between 2013 and 2015, all related to flooding. Although the NOAA Storm Events Database did not list flood events reported specifically for the City of Woodcreek, Table WC.7 lists the 69 documented events reported for Hays County between the years 1997 and 2016. Due to the size and extent of some flood occurrences, as well as the regional nature of reports in the NOAA Storm Events Database, the City of Woodcreek may have been affected by many of the events that were reported for the surrounding areas.

Fatality, injury and damage amounts are shown in Table WC.7, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table WC.7, Flood Events, Hays County

Location	Date	Type	Fatalities	Injuries	Property Damage	Crop Damage
Countywide	5/23/1997	Flash Flood	0	0	10,000.00	0.00
Countywide	6/6/1997	Flash Flood	0	0	10,000.00	0.00
Countywide	6/7/1997	Flash Flood	0	0	15,000.00	0.00
Countywide	6/8/1997	Flash Flood	2	7	2,500,000.00	50,000.00
Countywide	6/21/1997	Flash Flood	0	0	5,000.00	0.00
Countywide	6/22/1997	Flash Flood	0	0	50,000.00	50,000.00
Countywide	2/21/1998	Flash Flood	0	0	5,000.00	0.00
Countywide	7/3/1998	Flash Flood	0	0	20,000.00	0.00
Countywide	8/22/1998	Flash Flood	0	0	20,000.00	10,000.00
Countywide	8/23/1998	Flash Flood	0	0	10,000.00	0.00
Countywide	10/17/1998	Flash Flood	0	100	500,000.00	50,000.00
HAYS (ZONE)	10/17/1998	Flood	0	25	4,000,000.00	50,000.00
HAYS (ZONE)	10/17/1998	Flood	0	25	4,000,000.00	50,000.00
Countywide	6/21/1999	Flash Flood	0	0	3,000.00	0.00
Countywide	6/9/2000	Flash Flood	0	0	15,000.00	0.00
Countywide	11/2/2000	Flash Flood	0	0	20,000.00	0.00
HAYS (ZONE)	11/4/2000	Flood	0	0	0.00	0.00
North Portion	8/26/2001	Flash Flood	0	0	10,000.00	0.00
Countywide	8/31/2001	Flash Flood	0	0	20,000.00	0.00
Countywide	8/31/2001	Flash Flood	0	0	30,000.00	20,000.00
Countywide	11/15/2001	Flash Flood	0	20	200,000.00	50,000.00
HAYS (ZONE)	11/15/2001	Flood	0	0	0.00	0.00
West Portion	6/30/2002	Flash Flood	0	0	10,000.00	0.00
HAYS (ZONE)	7/1/2002	Flood	0	0	0.00	0.00
South Portion	7/1/2002	Flash Flood	0	0	0.00	0.00
Countywide	7/2/2002	Flash Flood	0	0	0.00	0.00
West Portion	7/3/2002	Flash Flood	0	0	0.00	0.00
West Portion	7/5/2002	Flash Flood	0	0	0.00	0.00
South Portion	9/19/2002	Flash Flood	0	0	0.00	0.00



Hays County Hazard Mitigation Plan, City of Woodcreek Annex

Table WC.7, Flood Events, Hays County (cont.)

Location	Date	Type	Fatalities	Injuries	Property Damage	Crop Damage
South Portion	10/24/2002	Flash Flood	0	0	0.00	0.00
Countywide	11/4/2002	Flash Flood	0	0	0.00	0.00
Countywide	2/20/2003	Flash Flood	0	0	10,000.00	0.00
West Portion	6/13/2003	Flash Flood	0	0	5,000.00	0.00
South Portion	9/11/2003	Flash Flood	0	0	3,000.00	0.00
Northwest Portion	1/16/2004	Flash Flood	0	0	3,000.00	0.00
East Portion	6/5/2004	Flash Flood	0	0	0.00	0.00
Countywide	6/9/2004	Flash Flood	0	0	350,000.00	0.00
Driftwood	6/26/2004	Flash Flood	0	0	0.00	0.00
West Portion	6/27/2004	Flash Flood	0	0	0.00	0.00
West Portion	6/28/2004	Flash Flood	0	0	0.00	0.00
Countywide	6/29/2004	Flash Flood	0	0	0.00	0.00
South Portion	6/30/2004	Flash Flood	0	0	0.00	0.00
HAYS (ZONE)	6/30/2004	Flood	0	0	0.00	0.00
West Portion	7/25/2004	Flash Flood	0	0	0.00	0.00
Countywide	10/2/2004	Flash Flood	0	0	0.00	0.00
Countywide	10/23/2004	Flash Flood	0	0	0.00	0.00
HAYS (ZONE)	10/23/2004	Flood	0	0	0.00	0.00
HAYS (ZONE)	10/24/2004	Flood	0	0	0.00	0.00
Countywide	11/16/2004	Flash Flood	0	0	0.00	0.00
HAYS (ZONE)	11/17/2004	Flood	0	0	0.00	0.00
Countywide	11/21/2004	Flash Flood	0	0	0.00	0.00
Countywide	11/22/2004	Flash Flood	0	0	0.00	0.00
Countywide	11/22/2004	Flash Flood	0	0	0.00	0.00
Southeast Portion	11/23/2004	Flash Flood	0	0	0.00	0.00
South Portion	5/6/2006	Flash Flood	0	0	0.00	0.00
Henly	3/30/2007	Flash Flood	0	0	0.00	0.00
Driftwood	3/30/2007	Flood	0	0	0.00	0.00
Henly	5/2/2007	Flash Flood	0	0	0.00	0.00
Henly	7/2/2007	Flash Flood	0	0	0.00	0.00
Henly	5/17/2010	Flash Flood	0	0	0.00	0.00
Driftwood	9/7/2010	Flash Flood	0	0	0.00	0.00
Driftwood	5/10/2012	Flash Flood	0	0	0.00	0.00
Driftwood	5/11/2012	Flash Flood	0	0	0.00	0.00
Fitzhugh	5/17/2015	Flash Flood	0	0	0.00	0.00
Henly	5/30/2015	Flash Flood	0	0	0.00	0.00
Fitzhugh	6/14/2015	Flash Flood	0	0	0.00	0.00
Driftwood	10/30/2015	Flash Flood	0	0	10,000,000.00	0.00
Fitzhugh	5/19/2016	Flash Flood	0	0	0.00	0.00
Driftwood	8/16/2016	Flash Flood	0	0	0.00	0.00
Total			2	177	\$21,824,000.00	\$330,000.00

(National Oceanic and Atmospheric Administration Storm Events Database, 2016)





Floods: Significant Past Events

Hays County experienced 3 disaster declarations discussed under Floods: Previous Occurrences. Refer to the *Floods: Significant Past Events* section within the Hays County Annex for narratives discussing these events.

Floods: Extent

Flood extent is described through a combination of ground elevation, river heights, 100-year Water Surface Elevations (WSE's) and HAZUS depth grids. Areas along Cypress Creek running through the western and southern edge of the City are exposed to the greatest extent of a flood event. An example of flooding within the jurisdiction is the area along the southern edge of the community along the creek have an approximate overbank ground elevation of 915 feet with an intersecting 100-year WSE of 927 feet. An 100-year event, water depth of approximately 12 feet can be expected within this area. A further analysis of Cypress Creek height is described below.

With Cypress Creek having an approximate average in-channel normal elevation of 901 feet (per Light Detection and Ranging [LiDAR] data) and an intersecting WSE of approximately of 927 feet, flood depths would be 26 feet.

Floods: Probability

Probability has been calculated on the basis of NOAA reported events, as a standard, consistent calculation method for all hazards profiled with the Hays County HMP. Based on 69 reported events in 19 years, a flood event occurs approximately 3 to 4 times per year on average in Hays County and its unincorporated jurisdictions. Due to the size and extent of some flood occurrences, as well as the regional nature of reports in the NOAA Storm Events Database, the City of Woodcreek's future probability is assumed to be similar to the surrounding County area. The City can expect a flood event approximately 3 to 4 times per year on average in the future, with flood water depths of 26 feet.

Floods: Impact

The following describes the inventory counts and building replacement values for the jurisdictional area.

Woodcreek Building Counts			
Residential	Commercial	Other	Total
677	31	16	724

Woodcreek Building Replacement Value		
Building (\$)	Content (\$)	Total (\$)
230,196,188	133,356,305	363,552,493

A Probabilistic 100-year Return Period HAZUS-MH 3.2 analysis was run on the participating community. HAZUS results are calculated to census blocks. This analysis utilized the best available LiDAR (COA 2012 and CAPCOG 2008) and Depth Grids. The following describes the inventory counts and building replacement values for the jurisdictional area. These blocks were then intersected with Woodcreek to run a weighted area analysis for jurisdictional results. The following paragraphs describe the results from the 100-year Return (1% Annual Chance Event) weighted area analysis.



HAZUS-MH Results

General Building Stock Damage

HAZUS estimates that 27 buildings will be at least moderately damaged in Woodcreek. 'At least moderately damaged' is defined by HAZUS as greater than 10% damage to a building. For this scenario, only residential buildings were at least moderately damaged.

Residential Buildings	Commercial Buildings	Other Buildings	Total Buildings
27	0	0	27

Building-Related Losses

Exposed Value is the total building and content values for structures within the community. The exposed value for the community is \$363,552,493. The total building related losses were \$127,493,024 for this scenario. This represents 5% of the total replacement value of the community. Loss values are divided into building and content loss dollars.

Building Loss (\$)	Content Loss (\$)	Total Loss (\$)
76,292,272	51,200,752	127,493,024

Essential Facility Damage

HAZUS does not estimate any critical facilities or infrastructure interruption for more than 1 day. The model estimates that 100% of community hospital beds are ready for use by patients already in the hospital and for those injured by an event.

Debris Generation

HAZUS estimates the amount of debris that will be generated in this scenario at a total of 1.360 tons. If the building debris tonnage is converted to an estimated number of truckloads, it will require 55 truckloads (with 1 to 25 tons per truck) to remove the building debris generated in this scenario.

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS also estimates the number of people displaced that will require accommodations in temporary public shelters. The model estimates 89 people will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 83 people are estimated to seek temporary shelter in public shelters.

Floods: Vulnerability Summary

Excluding the recently annexed subdivision of Oak Orchard Enclave, there are only 3 permanent access points and 1 emergency access point to the City. The access from Farm to Market (FM) 2325 is a secondary access across a load limited, privately owned, single lane, low-water bridge across Cypress Creek. There are 2 primary access points off RR 12 at Woodcreek Drive and Brookmeadow Drive. LaRocca Lane is an emergency access point for EMS and other emergency services. Accessibility to emergency services are at risk due to the limited points of access in the City.

In addition, there is also risk to transformer boxes for Pedernales Electrical Cooperative that are located in the floodplain. According to community testimony, these boxes have been impacted in the past and the resulting outage kept people without power for days.





National Flood Insurance Program Repetitive Loss (RL)

The City of Woodcreek is a current participant in the National Flood Insurance Program (NFIP) and has 4 tallied Repetitive Loss (RL) payments (as of September of 2016) with an average total (building & contents) payment of \$64,287.91.

Structure Type	Number of Structures	Amount of Claims
Residential	2	\$257,151.65
Non-Residential	0	N/A





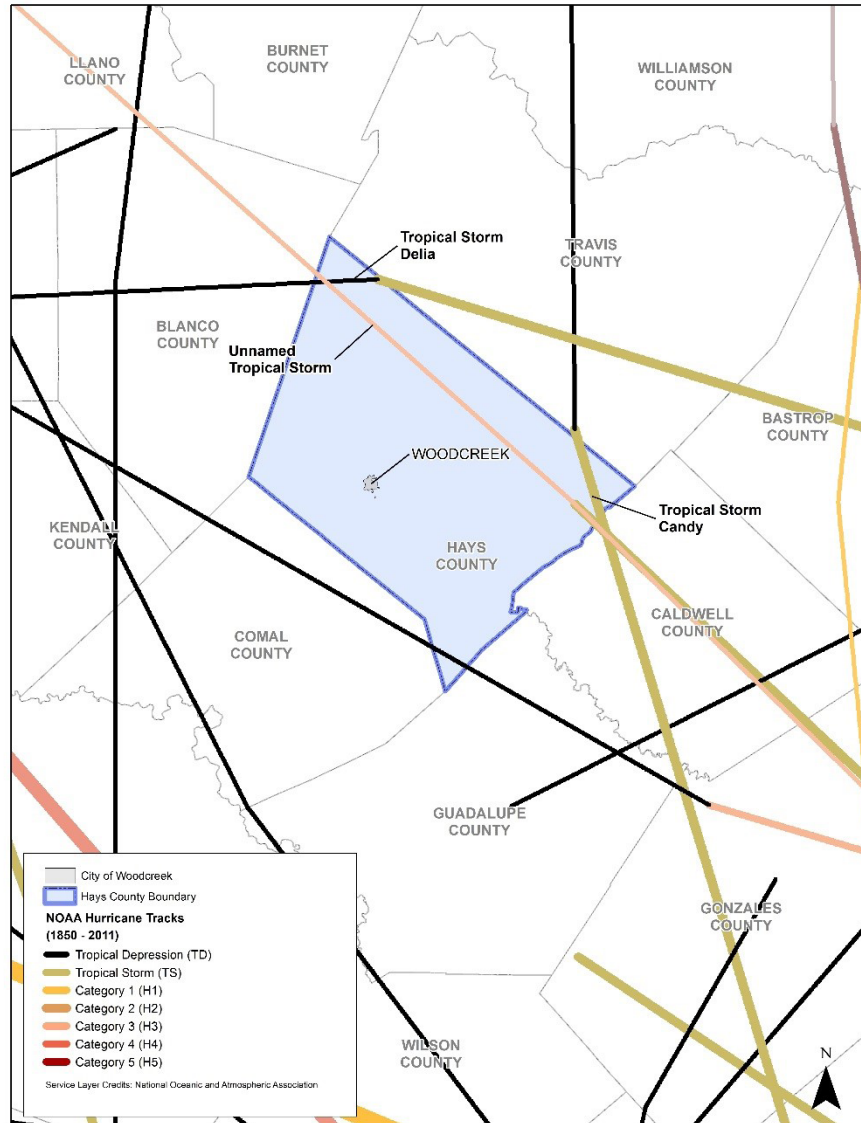
Hurricanes/Tropical Storms

Hurricanes/Tropical Storms: Location

Due to the regional nature of a hurricane or tropical storm event, the entire extent of the City of Woodcreek is equally exposed to a hurricane or tropical storm.

Figure WC.6 illustrates the location of the jurisdiction with historical hurricane and tropical storm paths documented by NOAA's Hurricane Tracker from 1850 to 2011.

Figure WC.4, Historical Hurricane/Tropical Storm Paths, City of Woodcreek



(National Oceanic and Atmospheric Administration, 2016)

Hurricanes/Tropical Storms: Previous Occurrences

Previous events are described below based on the NOAA Storm Events Database for Tropical Storm Hermine and NOAA Hurricane Tracker for all other events. By the time most hurricanes reach the County, they are tropical storms, depressions or thunderstorms. Because hurricane and tropical storm events occur on a regional scale, all events listed for Hays County have been included, as they would impact the City of Woodcreek.





July 13 to July 22, 1909 – An unnamed storm made landfall near Freeport, as a Category 3 Hurricane. This storm impacted Hays County and participating communities as a tropical depression with wind speeds up to 30 knots. No significant damages, injuries, or fatalities were reported for the City.

June 22 to June 26, 1968 – Tropical Storm Candy made landfall near Port Aransas. This storm impacted Hays County and participating communities as a tropical storm with wind speeds slowing to 30 knots as a tropical depression just after leaving the County. No significant damages, injuries, or fatalities were reported for the jurisdiction.

September 1 to September 7, 1973 – Tropical Storm Delia made landfall near the border of Brazoria and Matagorda Counties. This storm impacted Hays County and participating communities as a tropical storm with wind speeds slowing to 30 knots as a tropical depression just after leaving the County. No significant damages, injuries, or fatalities were reported for the jurisdiction.

September 6 to September 8, 2010 – According to the NOAA Storm Events Database, Tropical Storm Hermine made landfall near the Texas/Mexico border on the night of September 6. South Central Texas was hit very hard with widespread rains of 8-12 inches across much of the IH-35 corridor from Austin down to San Antonio.

Hurricanes/Tropical Storms: Extent and Probability

The Saffir-Simpson Scale measures pressure, wind speed, and storm surge in 5 categories. According to the reported previous hurricane occurrences in the jurisdiction, the maximum hurricane extent experienced was categorized as a tropical storm. Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of storm extents.

Based on 4 reported events in 107 years, a hurricane or tropical storm event occurs approximately every 27 years on average in Hays County. Since hurricane and tropical storm events can happen anywhere throughout the HMP update area, the City of Woodcreek's future probability is assumed to be similar to the surrounding County areas. In the future, the City can expect an event approximately once every 27 years on average, of up to a magnitude of a Tropical Storm at a 100-year Max Wind Speed of 71 mph based on historical extents and HAZUS analysis.

Hurricanes/Tropical Storms: Impact

A Probabilistic 100-year Return Period HAZUS-MH 3.2 analysis was run for the City of Woodcreek. The following describes the results of this analysis.

HAZUS-MH Results

General Building Stock Damage

The total property damage losses were \$18,638. The majority of damage can be expected to impact residential areas (98%). The remaining damages (2%) are for commercial, industrial, agricultural and religious buildings. While some building damage is experienced, it is estimated that no buildings will be completely destroyed or experience severe damage. Exposed Value is the total building and content values for homes within the community. Loss values are divided separately for building and content loss in dollars. There were no building interruption losses.

Exposed Value (\$) (Building + Content)	Building Loss (\$)	Content Loss (\$)	Total Loss (\$)
363,552,493	18,638	0	18,638



Essential Facility Damage

HAZUS does not estimate any critical facilities or infrastructure interruption for more than 1 day. The model estimates that 100% of community hospital beds are ready for use by patients already in the hospital and for those injured by the hurricane.

Debris Generation

HAZUS estimates the amount of debris that will be generated by the hurricane at a total of 1 ton. Of the total amount, Brick/Wood comprises 100% of the total. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckload (with 1 to 25 tons per truck) to remove the building debris generated by the hurricane.

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number people displaced that will require accommodations in temporary public shelters. The model estimates no households to be displaced due to the hurricane. While there is an estimation of over \$18,000 in property damages expected, it is aforementioned that “no buildings are estimated to be completely destroyed or experience severe damage.” Residents would likely remain in their homes as damages were repaired, therefore it is estimated that no temporary shelter is needed.

Hurricanes/Tropical Storms: Vulnerability Summary

Similar to the impacts of windstorms, hailstorms, and lightning, Woodcreek can expect to be impacted with debris and possible utility interruptions of critical infrastructure, if the event is a stronger magnitude than those previously experienced by the City. In addition, the community’s proximity to IH-35 could lead to traffic delays caused by major evacuation efforts, if the highway is used as an evacuation route for coastal residents.



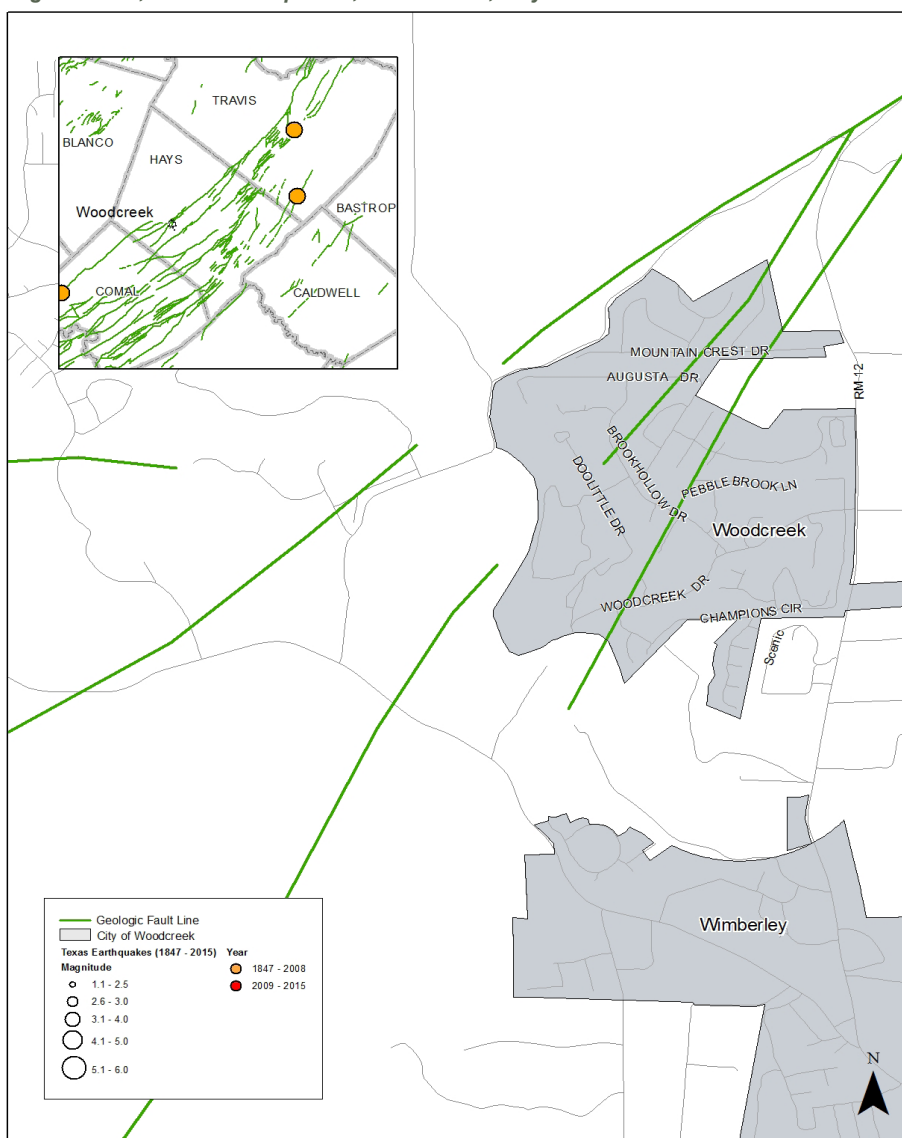


Earthquakes

Earthquakes: Location

Locations within proximity to USGS-documented fault lines are typically the areas most at-risk for earthquakes. Figure WC.7 shows fault lines and the locations of earthquake events occurring from 1847 to 2015 in relation to the City of Woodcreek.

Figure WC.5, Texas Earthquakes, 1847 – 2015, City of Woodcreek



(USGS Earthquake Hazard Program, 2015)

Earthquakes: Previous Occurrences

According to USGS 1847-2015 data, there have been no documented earthquake events for the City of Woodcreek, as illustrated in Figure WC.7.

Earthquakes: Extent and Probability

Earthquakes are measured by Peak Ground Acceleration (PGA). The HAZUS Max PGA for the jurisdiction is 1.53% (see City of Woodcreek Earthquakes: Impact Section for a description of the HAZUS Analysis).





This corresponds to the Modified Mercalli Scale Category IV, with light perceived shaking and no potential structure damage. HAZUS measures PGA on a census tract level. Cities within more than 1 census tract were assigned the highest PGA level to reflect the maximum possible extent. Refer to Chapter 2 for extent scale descriptions (the risk assessment portion of the main plan document).

As there have been no recorded previous occurrences of earthquakes for the City of Woodcreek and the PGA is less than 2% for the area, the probability of an earthquake in the City in the future is low (0 - 1 occurrences in the next 10 years at up to a 500yr PGA of 1.53%).

Earthquakes: Impact

The FEMA How-To Guidance, Understanding Your Risks (FEMA 386-2, page 1-7), suggests the earthquake hazard should be profiled if the PGA is greater than 3%g, where PGA is measured in the acceleration of gravity (g). The City's PGA is less than 3%g (0.03) and there have been no recorded earthquakes in or near the update area. Therefore, only a minimum level-1 HAZUS analysis was profiled using the 500-year probability event scenario. The HAZUS analysis produced a PGA of 1.53%. HAZUS scenario would produce \$0 in building damages (Residential, Commercial, Agriculture, Religious and Government) from an event. Critical facilities and Infrastructure would not experience any loss of service. There would be no critical facilities or infrastructure that would experience moderate to complete damage. No debris would be generated from this event and no people or households would require temporary housing. There would be no moderate, extensive or completely damaged buildings by this event. HAZUS estimates no residents are expected to be displaced from their homes or will require accommodations in temporary public shelters due to the simulated earthquake. Additionally, there would be no casualties or fatalities from this event.

Earthquakes: Vulnerability Summary

While the probability of an earthquake in Woodcreek is low, with no significant prior events on file, there are fault lines within the community that could cause impact if there were to be an increase in seismic activity in the area. There are 2 fault lines located within the jurisdiction according to USGS data. Woodcreek could expect to be impacted with debris and possible utility interruptions if an event were to occur in an unlikely and unprecedented scenario exceeding the 500-year probability event scenario run in HAZUS. If an event were to incapacitate a roadway, emergency responders would be hindered from responding, leaving the residents at risk. The following local roadways are crossed by the USGS fault lines displayed on Figure WC.7: Augusta Drive, Augusta Lane, Brookhollow Drive, Brookmeadow Drive, Brookside Drive, Champions Circle, Live Oak Drive, Mountain Crest Drive, Overbrook Court, Pebble Brook Lane, Pro Lane, and Woodcreek Drive.

Additionally, a fault line intersects Quicksand Golf Course, a recreational tourist population location within the City.





Page 23, 24, and 25 Dam/Levee Failure have been redacted from this copy of the plan.

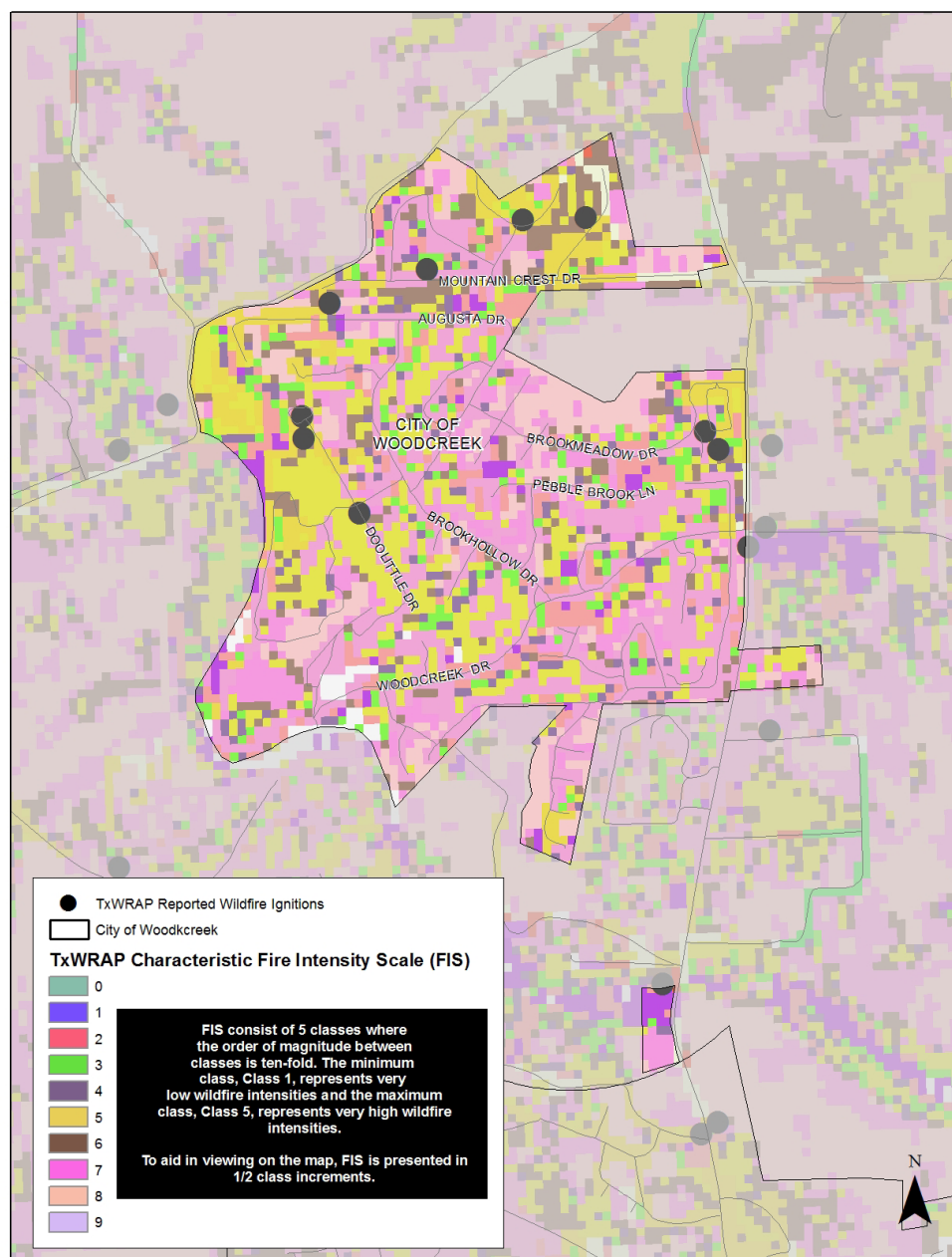


Wildfires

Wildfires: Location

Wildfires can be ignited from a variety of sources including lightning or human activity such as campfires, smoking, arson, or equipment use. The Texas A&M Forest Service's Texas Wildfire Risk Assessment Portal (TxWRAP) can be used to help communities understand their wildfire risk. Figure WC.9 below shows the location of TxWRAP's documented wildfire occurrences with Fire Intensity Scale (FIS) classifications within the City of Woodcreek. TxWRAP identifies FIS areas as those where wildfire fuels and associated potential dangerous fire behavior exist, based on a weighted average of 4 percentile weather categories.

Figure WC.7, Fire Intensity Scale (FIS) and Reported Wildfire Ignitions, City of Woodcreek



(Texas A&M Forest Service, 2016)



Wildfires: Previous Occurrences

Table WC.9 shows the reported wildfire ignitions within the City of Woodcreek, according to TxWRAP and USGS Federal Fire Occurrence data from the years 1980 to 2015.

Table WC.9, Wildfire Ignitions, City of Woodcreek

FPA ID	Date	Fire Size (Acres)
SFO-TX0484-177157	11/19/2008	2
SFO-TX0484-177162	11/19/2008	0.1
TFS-TXFD2009-192915	3/18/2009	1
TFS-TXFD2009-214520	7/19/2009	3
TFS-TXFD2011-350011	9/24/2011	0.1
NA	NA	0.1
NA	NA	0.2
NA	NA	0.1
NA	NA	0.2

Wildfires: Extent and Probability

Table WC.10 lists the Fire Intensity Acreage for the City, according to the Texas A&M Forest Service TxWRAP Community Summary Report. Refer to Chapter 2, the risk assessment portion of the main plan document, for a description of the FIS.

Table WC.10, TxWRAP Fire Intensity Acreage, City of Woodcreek

Class	Acres	Percent
Non-Burnable	266	38.8 %
1 (Very Low)	20	2.9 %
1.5	73	10.7 %
2 (Low)	28	4.0 %
2.5	3	0.4 %
3 (Moderate)	138	20.1 %
3.5	19	2.7 %
4 (High)	56	8.1 %
4.5	84	12.3 %
5 (Very High)	0	0.0 %
Total	685	100.0 %

Based on 9 reported events in 35 years, City of Woodcreek future probability for a wildfire event approximately once every 3 to 4 years (on average) in the future, with up to a potential fire intensity of up to 4.5, or “High” classification on the TxWRAP FIS.





Wildfires: Impact

Impact on the community can be measured using TxWRAP Housing Density levels within the WUI. Areas with a higher housing and population density would be affected to a greater extent than rural areas, especially in areas near burnable fuels. In the event of a wildfire in high density areas of population, residential structures would be damaged or destroyed, critical infrastructure such as water, sewer and electrical services would be interrupted and residents would experience injury or loss of life. Table WC.11 below lists the population, percent of total population,

WUI acreage and percent of WUI acreage for the City of Woodcreek, according to the Texas A&M Forest Service TxWRAP Community Summary Report.

Table WC.11, WUI Acreage, City of Woodcreek

Housing Density	WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
LT 1hs/40ac	0	0.0 %	0	0.0 %
1hs/40ac to 1hs/20ac	0	0.0 %	0	0.0 %
1hs/20ac to 1hs/10ac	0	0.0 %	1	0.1 %
1hs/10ac to 1hs/5ac	0	0.0 %	3	0.5 %
1hs/5ac to 1hs/2ac	269	14.0 %	120	17.9 %
1hs/2ac to 3hs/1ac	1,650	86.0 %	545	81.5 %
GT 3hs/1ac	0	0.0 %	0	0.0 %
Total	1,919	100.0 %	668	100.0 %

Wildfires: Vulnerability Summary

Areas of concern include parts of the community where empty lots intermingle with residences. Residents can call City Hall to enforce ordinance requirements to keep the lots from becoming overgrown. However, there will still be periods when lots become overgrown with vegetation. While City Hall and the City's water tower are surrounded by concrete and less vulnerable to the risk of fire, there is concern for the rest of the structures in the area. A new 72 unit apartment complex is a new source of vulnerability due to the high concentration of residents at the site.

There is an annual brush pick-up event that encourages individual wildfire mitigation efforts at the citizen-level.



2.2 Risk Ranking Result

On January 12, 2017, members of the City of Woodcreek MPC completed a questionnaire as part of the Hays County HMP Update: Risk Assessment. The questions covered the risk associated with the hazards that affect each community based on the level of concern over each profiled hazard, the hazards' impact on health and safety, as well as impact to property and business continuity. The answers from this questionnaire were combined with public survey results on perception of risk. The values from both sources were analyzed using the Halff Risk Ranking Tool (details regarding the risk ranking tool are in Chapter 2, the risk assessment portion of the main plan document). The results provided a quantified ranking of risk, with values ranging from 0 to 100. The results for Woodcreek are shown below (hazard values are shown from highest to lowest):

Ranking Order	Hazard	Risk Ranking Value
1	Drought	97.4
2	Floods	96.9
3	Wildfire	95.2
4	Windstorms	92.3
5	Severe Winter Storms	86.3
6	Lightning	72.1
7	Dam/Levee Failure	68.0
8	Hail Storms	57.1
9	Extreme Heat	51.3
10	Tornadoes	46.9
12	Expansive Soils	41.3
13	Earthquakes	39.0
14	Hurricanes/Tropical Storms	33.8
-	Land Subsidence	Not Profiled



Section 3: Mitigation Strategy

This section examines the community's ability to perform mitigation (a review of existing capabilities is shown in Table WC.12) and identifies specific actions to address vulnerabilities for each hazard profiled in the Hays County HMP Update. The mitigation strategy is the application of actions into an approach for performing structural and non-structural mitigation efforts within the jurisdiction. Actions are also prioritized and considered for incorporation into other community programs, regulations, projects or plans.

Completed and canceled actions are also included in a separate section for future reference.

3.1 Existing Capabilities

Table WC.12, Existing Capabilities

Capability Name	Capability Type	Ability to Expand/Improve
Mayor/Emergency Management Coordinator	Elected Official	Political support and funding for mitigation actions/ Management of City-level HMP updates. Could attend mitigation information session to learn about community risks and mitigation strategy.
City Administrator	City Staff	Support for implementation of mitigation actions. Could attend mitigation information session to learn about community risks and mitigation strategy.
City Manager	City Staff	Support of grant administration for funding opportunities. Attend hazard mitigation training session hosted by Texas Division of Emergency Management.
Engineer/Floodplain Administrator	Consultant	Expertise in structural mitigation projects and compliance with flood damage prevention ordinance. Attend advanced floodplain management training
Sales Tax	Funding	Provides potential funding for Hazard Mitigation items.
Property Tax	Funding	Provides potential funding for Hazard Mitigation items.
Permitting and Licensing Fees	Funding	Provides potential funding for Hazard Mitigation items.
Chapter 211 of the Local Government Code: Zoning	Authority	State-level code that authorizes the City to regulate Zoning.
Chapter 213 of the Local Government Code: Municipal Comprehensive Plans	Authority	State-level code that authorizes the City to adopt a comprehensive plan for the long-range development of the City.
Chapter 214 of the Local Government Code	Authority	Authorizes the City to have regulatory authority as it related to building code (such as structural integrity and plumbing). Can be enhanced to add more mitigation-related construction methods.
Woodcreek Ordinance Chapter 10: Rules of Construction	Regulation	Provides community with control of new construction. (American Legal Publishing Corporation, 2009) Can be enhanced to require roads and structures to be built according to techniques used to mitigate against natural hazards.
Woodcreek Ordinance Chapter 32: Finance and Revenue	Regulation	Sets tax rates for community and right to tax (American Legal Publishing Corporation, 2013). Can allow for specific collection of taxes that fund mitigation projects.

Table WC.12, Existing Capabilities

Capability Name	Capability Type	Ability to Expand/Improve
Woodcreek Ordinance Chapter 34: Emergency Management	Regulation	Establishes Emergency Management Program. (American Legal Publishing Corporation, 2000) Can be enhanced to increase emphasis on mitigation duties and priorities.
Woodcreek Ordinance Chapter 35: Fee Schedule	Regulation	Provides for fees that could contribute to mitigation projects (American Legal Publishing Corporation, 2011).
Woodcreek Ordinance Chapter 93: Fire Prevention and Protection	Regulation	Provides for Fire Protection provisions required. Can be enhanced to further mitigate against wildfire hazards. (American Legal Publishing Corporation, 1985)
Woodcreek Ordinance Title XV: Land Usage	Regulation	Provides regulation over building regulations, flood damage prevention, site development, subdivisions, zoning, parks and recreation (American Legal Publishing Corporation, 2007). Can be enhanced to require reference to risk assessment information from hazard mitigation planning committee.



3.2 National Flood Insurance Program Participation

The City of Woodcreek participates in the National Flood Insurance Program and has adopted the minimum standards required of 44CFR60.3 in their Flood Damage Prevention Ordinance. Woodcreek does not have a Certified Floodplain Manager on staff, but contracts out their floodplain management duties to a Professional Engineer trained in the administration of the program. The City will continue to explore options for higher standards and also consider the cost and benefits of application for participation in the Community Rating System. The City of Woodcreek has a total of 48 NFIP policies in force, as of June 2016, for a total of \$12,959,900 in insurance coverage.

3.3 Mitigation Goals

The plan-level Mitigation Goals can be found in Chapter 3, the Mitigation Strategy portion of the Hays County HMP Update. These goals apply to each community and were mutually decided upon as the guiding goals for the development of actions in each jurisdiction.

3.4 Mitigation Actions

Risk focus is defined as:

*E= Actions reducing risk to existing buildings and infrastructure

*F= Actions reducing risk to new development and redevelopment

Number/Title	Hazard	Item Description	Implementation Agency	
1 CFM Training and CFM Certification (previously action 3 in 2011 plan, modified)	Flood	Send designated floodplain administrator to attend floodplain management courses and to test for certification as a Certified Floodplain Manager.	City of Woodcreek City Hall	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services resources, time for training, cost of class (less than \$250), lodging/per diem costs, if training is outside of County		3 months	Not started	E/F
Cost and Benefit Considerations				
The cost of floodplain management training from the Texas Water Development board or Texas Floodplain Management Association is low and the classes are readily accessible throughout Texas. The benefits of better informing local officials on administering the flood damage prevention ordinance are critical toward responsible future growth. All owners of new development and substantial improvement to existing structures will benefit.				
Number/Title	Hazard	Item Description	Implementation Agency	
2 Emergency Communications Plan/ Coordination (previously action 4 in 2011 plan, modified)	Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Floods, Hurricanes/Tropical Storms, Earthquakes, Dam/Levee Failure, Wildfires	Establishment of a community promotion for enrollment in CAPCOG's reverse calling system. The community currently has a system for texts and email.	City of Woodcreek City Hall	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services resources		12 months	Not started	N/A
Cost and Benefit Considerations				
Low-cost coordination efforts will assist the community in registering all of the members of the community so that they may receive communication to take shelter, protective measures or evacuation procedures in the event of a disaster or disaster conditions. The benefit to protection of human life is not quantifiable but should be considered justifiable.				
Number/Title	Hazard	Item Description	Implementation Agency	
3 Storm Ready Designation from National Weather Service (previously action 6 in 2011 plan)	Severe Winter Weather, Lightning, Hailstorm, Windstorm, Tornadoes, Floods, Hurricanes/Tropical Storms	Application for designation that classifies community's level of preparedness for severe weather and storms.	City of Woodcreek City Hall	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services		6 months	Not Started	N/A
Cost and Benefit Considerations				
There is a high-level of effort required to complete the application, however no other cost applies. The level of increased preparedness would benefit the entire population.				

Hays County Hazard Mitigation Plan, City of Woodcreek Annex

Number/Title	Hazard	Item Description	Implementation Agency	
4 Cooling Plan Creation (previously action 7 in 2011 plan, modified)	Extreme Heat	Documented plan for how to provide cool accommodations for vulnerable populations during periods of extreme heat when electrical power is interrupted.	City of Woodcreek City Hall	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services		6 months	Not started	N/A
Cost and Benefit Considerations				
With Existing Staff/ In-Kind Services documenting the inter-local agreements for assisting each other with accommodating their vulnerable populations, this effort would benefit members of the population who are either over 65 or under 16 years of age.				

Number/Title	Hazard	Item Description	Implementation Agency	
5 Promote Flood Insurance in the Community (previously action 8 in 2011 plan, modified)	Floods	Placing National Flood Insurance Program information brochures in City Hall.	City of Woodcreek City Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services, free brochures from FEMA		1 month	In progress	N/A
Cost and Benefit Considerations				
The cost and labor required to promote the NFIP is negligible. The benefit is difficult to estimate.				

Number/Title	Hazard	Item Description	Implementation Agency	
6 Increase Public Awareness of Hazard Mitigation (previously action 9 in 2011 plan)	Drought, Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Expansive Soils, Floods, Hurricanes/Tropical Storms, Earthquakes, Dam/ Levee Failure, Wildfires	Increasing public awareness of natural hazards and hazardous areas; distributing public awareness information regarding hazards and potential mitigation measures. Promotional sources would include City website, social media and public education programs. Provide link to HaysInformed.com	City of Woodcreek City Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services		1 month	Not started	N/A
Cost and Benefit Considerations				
This action will promote a well-informed and engaged citizenry and support a high quality of life. Not independently cost-effective.				



Hays County Hazard Mitigation Plan, City of Woodcreek Annex

Number/Title	Hazard	Item Description	Implementation Agency	
7 Adopt Wildfire Maps from Hays County Firewise project (previously action 10 in 2011 plan, modified)	Wildfires	Formally adopt the maps created through the Hays County application for Firewise designation in order to begin to control development, in accordance with the avoidance of hazard areas and with consideration of proper mitigation.	City of Woodcreek City Hall, in coordination with Hays County Fire Marshal's office	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services		6 months	Not started	E/F
Cost and Benefit Considerations				
The benefit of mitigating against wildfire for future development, as well as for instituting fire mitigation in existing areas of development greatly saves the community from the costs of potential damages.				

Number/Title	Hazard	Item Description	Implementation Agency	
8 Coordination of Marketing Large Item Pick-up day for Wildfire Mitigation (previously action 15 in 2011 plan, modified)	Wildfire, Lightning, Windstorms, Tornadoes	Enhancement of existing large item pick-up to emphasize the wildfire mitigation benefits of cleaning brush and overgrown lots.	City of Woodcreek Administrator in coordination with waste disposal service provider	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services		2 months	Ongoing	N/A
Cost and Benefit Considerations				
This slight change to marketing an existing event would likely lessen the risk for wildland fire for residents located within the Wildland Urban Interface.				

Number/Title	Hazard	Item Description	Implementation Agency	
9 Drought Monitoring Program and Contingency Plan Creation/ Implementation (previously action 11 in 2011 plan, modified)	Drought	Develop and implement Drought Contingency Plan incorporating water conservation measures. Monitor drought conditions.	City of Woodcreek Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services		6 months	Not started	N/A
Cost and Benefit Considerations				
This low cost monitoring and inclusion of drought water conservation measures will take more time than money to institute and will help reduce community impacts from a water shortage. All residents that use the water source would benefit.				



Hays County Hazard Mitigation Plan, City of Woodcreek Annex



Number/Title	Hazard	Item Description	Implementation Agency	
10 Energy Prioritization Collaboration with Electric Cooperative (previously 13 in 2011 plan, modified)	Extreme Heat, Severe Winter Storms, Lightning, Windstorms, Tornadoes, Hurricanes/ Tropical Storms	Identification and documentation of members of the community who depend on electricity for survival (medical).	City of Woodcreek Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services		6 months	Not started	N/A
Cost and Benefit Considerations				
This low cost project for prioritizing energy restoration for those with special needs within the community that would be impacted by hazards that are known for affecting impact to electrical power. All those with special needs from electrical resources would benefit.				

Number/Title	Hazard	Item Description	Implementation Agency	
11 Generator Purchase and Installation for City Hall	Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Floods, Hurricanes/Tropical Storms, Earthquakes, Dam/ Levee Failure, Wildfires	Installation of back-up electrical power in City Hall to ensure continuity of government operations and to also provide temporary sheltering for vulnerable populations in the City.	City of Woodcreek City Council	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$5,000 HMGP Grant funding with community share covered by Woodcreek		18 months	Not started	N/A
Cost and Benefit Considerations				
If grant funding is eligible, the cost/benefit of this project would have to be positive. There is only 1 public building in the town in use and it has no back-up source for power.				

Number/Title	Hazard	Item Description	Implementation Agency	
12 Watershed Review Tour for Private Dams (previously action 18 in 2011 plan, modified)	Dam/Levee Failure, Floods	Plan for how to enforce flood damage prevention ordinance against encroachments in the floodway by inspecting for private dams that are not authorized and requirement of no-rise study when they are found.	City of Woodcreek Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services		6 months	Not started	E
Cost and Benefit Considerations				
This effort of enforcement will protect downstream properties and protect the community from liability from encroachments that create adverse impact. Although benefits are unquantifiable at this point, the cost is low enough for it to be negligible.				

Hays County Hazard Mitigation Plan, City of Woodcreek Annex

Number/Title	Hazard	Item Description	Implementation Agency	
13 Evacuation Plans/ Alternate Road Consideration (previously item 19 in 2011 plan)	Hurricanes/ Tropical Storms, Floods, Dam/ Levee Failure, Wildfire	Documentation of an evacuation plan that includes multiple exits for the community.	City of Woodcreek City Hall	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services		18 months	In progress	F
Cost and Benefit Considerations				
The cost of not establishing a way out of the community would greatly outweigh the cost of mitigating the risk of not being able to get citizens out of danger.				

Number/Title	Hazard	Item Description	Implementation Agency	
14 Adoption of Soil Compaction Standards and Recommendations	Expansive Soils	Road techniques that require soil compaction to mitigate Expansive Soils. Recommendation documents for soil compaction to lessen the possible effects of expansive soils to accompany existing slab requirements for manufactured and mobile homes.	City of Woodcreek City Hall	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services, cost of engineer support		6 months	Not Started	F
Cost and Benefit Considerations				
This recommendation would add a level of protection to future development of foundations so that they mitigate against expansive soil damage.				

Number/Title	Hazard	Item Description	Implementation Agency	
15 Sanding Contract Research/ Plan Development (previously action 14 in 2011 plan)	Severe Winter Weather	Creation of a plan that provides established procedures and negotiated contract rates for sanding for the City streets.	City of Woodcreek Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services		12 months	Not Started	N/A
Cost and Benefit Considerations				
By setting rates for sanding for extreme cases of icy weather, the whole community could save money on potential price increases.				



Hays County Hazard Mitigation Plan, City of Woodcreek Annex

Number/Title	Hazard	Item Description	Implementation Agency	
16 Public Awareness Campaign for the Reduction of Groundwater Depletion (previously action 12 in 2011 plan, modified)	Drought	Develop public information campaign to inform the public of water conservation practices.	City of Woodcreek Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
Existing Staff/ In-Kind Services		6 months	Not started	N/A
Cost and Benefit Considerations				
The intended benefit of a reduction in wasted water and promotion of conservation that would greatly benefit all members of the community. The project is very cost-efficient.				

Number/Title	Hazard	Item Description	Implementation Agency	
17 2-Way Radio Purchase for City Hall	Extreme Heat, Severe Winter Storms, Lightning, Hailstorms, Windstorms, Tornadoes, Floods, Hurricanes/Tropical Storms, Earthquakes, Dam/Levee Failure, Wildfires	Provide a secondary means of communication from an LCRA system for members of the City staff in the event of cell phone network unavailability (common during disasters).	City of Woodcreek Administrator	
Cost Estimate/Funding		Schedule	Status as of 2017	*Risk Focus:
\$200/Existing Staff/ In-Kind Services, LCRA collaboration		6 months	Not started	N/A
Cost and Benefit Considerations				
This low-cost project would ensure the continuity of operations for the City government and benefit all who reside in the community.				

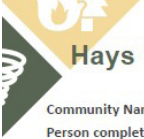


3.5 Capabilities Assessment

Evaluation/Prioritization of Actions

Each action added to the plan was developed using the Mitigation Action Summary Worksheet shown in Figure WC.10.

Figure WC.8, Mitigation Action Summary Worksheet



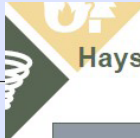
Hays County Hazard Mitigation Plan Update Process

Mitigation Action Summary Worksheet

Community Name:

Person completing questionnaire:

Mitigation Action/ Project Title	
Background/ Issue	
Opportunities for Integration	
Responsible Agency	
Partners	
Strategy for Existing Structures	



Hays County Hazard Mitigation Plan Update Process

Mitigation Action Summary Worksheet

Strategy for Future Development	
Potential Funding	
Cost Estimate (Values from "Measuring Costs" fields from Benefit and Cost Review Worksheet)	
Benefits (Statements from the "Difference" fields on the Benefit and Cost Review Worksheet)	
Timeline	
Priority (Based off Priority worksheet)	



Hays County Hazard Mitigation Plan, City of Woodcreek Annex

Table WC.13, Mitigation Action Prioritization
(With Hazards in order of highest priority to lowest)

Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community	Risk Ranking Score	Total Score
6. Increase Public Awareness of Hazard Mitigation	1	1	1	1	0	1	1	1	0	1	97	105
13. Evacuation Plans/Alternate Road Consideration	1	0	1	1	1	0	1	1	0	1	97	104
7. Adopt Wildfire Maps from Hays County Firewise project	1	1	1	1	0	1	1	1	1	1	95	104
9. Drought Monitoring Program	1	0	1	1	0	1	1	1	0	1	97	104
3. StormReady Designation for Woodcreek	1	0	1	1	0	0	1	1	0	1	97	103
2. Emergency Communications-Phone Tree Development	1	0	1	1	0	0	1	1	0	1	97	103
16. Public Awareness Campaign for the Reduction of Groundwater Depletion	1	0	1	0	0	1	1	1	0	1	97	103
17. 2-Way Radio Purchase for City Hall	1	0	1	1	0	0	1	1	0	1	97	103
5. Promote Flood Insurance in the Community	0	0	1	1	0	0	1	1	0	0	97	101
1. Attend Local Floodplain Management Courses/Receive Certification	1	1	1	0	0	0	0	1	0	0	97	101
8. Coordination of Marketing Large Item Pick-up day for Wildfire Mitigation	1	1	1	1	1	1	-1	1	0	0	95	101
12. Watershed Review Tour for Private Dams	1	1	1	-1	-1	1	-1	1	0	0	97	99
10. Energy Prioritization Collaboration with Electric Cooperative	1	0	1	0	-1	0	1	1	0	0	92	95
11. Generator Purchase and Installation for City Hall	1	0	1	1	1	0	1	1	0	1	86	93
15. Sanding Contract Research/ Plan Development	1	0	1	1	1	0	1	1	0	0	86	92
4. Cooling Plan Development	1	0	1	0	0	0	1	1	0	1	51	56
14. Soil Compaction Recommendation	0	1	1	-1	0	0	1	1	0	0	41	44



Hays County Hazard Mitigation Plan, City of Woodcreek Annex

Mitigation Actions by Hazard

The mitigation actions in Table WC.14 are shown with the corresponding hazards.

Table WC.14, Mitigation Action Impact, Woodcreek

Action Number	Drought	Extreme Heat	Severe Winter Storms	Lightning	Hailstorms	Windstorms	Tornadoes	Expansive Soils	Floods	Land Subsidence	Hurricanes/ Tropical Storms	Earthquakes	Dam/ Levee Failure	Wildfire
1									X					
2		X	X	X	X	X	X		X		X	X	X	X
3			X	X	X	X	X		X		X			
4		X												
5									X					
6	X	X	X	X	X	X	X	X	X		X	X	X	X
7														X
8				X		X	X							X
9	X													
10		X	X	X		X	X				X			
11		X	X	X	X	X	X		X		X	X	X	X
12									X				X	
13									X		X		X	X
14								X						
15			X											
16	X													
17		X	X	X	X	X	X		X		X	X	X	X



3.6 Integration Efforts

Table WC.15 captures ways that the HMP risk assessment, mitigation goals and actions can be integrated into other City of Woodcreek documents, programs and regulations.

Table WC.15, Plan Integration Efforts, Woodcreek

Name of Document	Type	Item Type	Process for Integration
HaysInformed.com	Program	Action	Link to existing Hays County HaysInformed.com emergency preparedness/awareness page when creating Public Awareness Page for hazards on Woodcreek website (Action 6).
City of Woodcreek Budget	Funding	Action	Seek training funds for Floodplain Administration training on future budgets through Woodcreek Budget Line item "Training and Professional Development." Obtain Commissioner approval for change to budget.
Hays County Master Naturalist Project 1503	Program	Goals	Partner with members of the community who are volunteering with the project educating the public on native plant use for landscaping, rain garden installation and invite as stakeholders for future mitigation planning activities. Potential future item for Rain Garden displays at City Hall to encourage it among other community members.
Woodcreek Newsletter	Document	Goals	Coordinate with City Secretary to utilize a portion of the newsletter to share mitigation actions citizens can take in their own homes and lives to protect their structures from hazards.
Hazard Mitigation Grant Program (HMGP)	Funding	Action	Identify actions that can be funded through new and existing grant awards. Review existing mitigation actions for eligibility for the grant program, to include Benefit Cost consideration. Prepare grant application documents in advance to prepare for future grant application periods. Process involves identification of actions from Plan; obtaining Council approval to apply; notification of interest in grant to the public; completion of application for funding; if awarded, obtaining Council approval to accept; if accepted, administration of funds and implementation of project.
Pre-Disaster Mitigation (PDM)			
Flood Mitigation Assistance (FMA)			
TWDB Flood Protection Planning (FPP) Grant			
TWDB Clean Water State Revolving Fund (CWSRF)	Funding	Action	Identify actions that can be funded through new and existing loan programs. Review existing mitigation actions for eligibility for the grant program, to include Benefit Cost consideration. Prepare loan application documents in advance to prepare for future loan application periods. Process involves obtaining Council approval to apply; notification of interest in loan to the public; completion of application for loan; if awarded, obtaining Council approval to accept; if accepted, administration of funds and implementation of project.
Texas Water Development Fund (DFund)			



Hays County Hazard Mitigation Plan, City of Woodcreek Annex

Incorporation Achievements Since Previous Plan Update

The City of Woodcreek incorporated the HMP into other planning mechanisms as a demonstration of progress in local hazard mitigation efforts. This was achieved by identifying MPC planners and or stakeholders to participate in the creation of the City of Woodcreek 2020 Vision Master Plan.



Section 4: Finalize Plan Update (Review, Evaluation, and Implementation)

4.1 Changes in Development

The City of Woodcreek is small and almost completely residential. Averaging 10 development permits per year, changes in the make-up of the community are not actively occurring. The golf course and retail outlet continue to produce revenue.

An apartment complex was recently built in the City and that development should result in an increase in population. This may lead to an increase in vulnerability, due to the large concentration of residents in multi-family buildings.

4.2 Progress in Mitigation Efforts

2011 Action Number	Hazard	Item Description	Lead Department
1	Flood	Increase the number of Hays County communities that participate in the NFIP	City of Woodcreek
Cost Estimate/Funding		Schedule	Status as of 2017
Cost and Funding: Existing Staff/ In-Kind Services resources, no cost		Completed	Completed
Cost Effectiveness			
Not independently cost-effective			

2011 Action Number	Hazard	Item Description	Lead Department
2	Flood	2011-2013	City of Woodcreek
Cost Estimate/Funding		Schedule	Status as of 2017
Existing Staff/ In-Kind Services resources		Text	Canceled. Was considered but not adopted.
Cost Effectiveness			
Not independently cost-effective, but critical for reducing property damage and minimizing loss of life and injuries during flood events			



Hays County Hazard Mitigation Plan, City of Woodcreek Annex

2011 Action Number	Hazard	Item Description	Lead Department
5	All hazard	Development of and maintenance of Countywide and individual community HAZMAP Plans	City of Woodcreek
Cost Estimate/Funding		Schedule	Status as of 2017
Existing Staff/ In-Kind Services resources		Original Plan adopted on 4/20/2004. Update in 2011	Completed.
Cost Effectiveness			
Not independently cost-effective			

2011 Action Number	Hazard	Item Description	Lead Department
16	Floods, thunderstorms, high winds, tornadoes, seismic	Upgrades to At-Risk Structures	City of Woodcreek
Cost Estimate/Funding		Schedule	Status as of 2017
Varies depending on measure. Funding from General Fund or FEMA grant program/s		TBD based on study	Canceled. Not fiscally feasible. More regulator measures adopted.
Cost Effectiveness			
Cost-effectiveness will vary with level of risk and project cost			

2011 Action Number	Hazard	Item Description	Lead Department
17	Floods, thunderstorms, high winds, tornadoes, seismic	Structural/Engineering Study of Woodcreek facilities	City of Woodcreek
Cost Estimate/Funding		Schedule	Status as of 2017
To be determined, but if initiated, probably from General Fund		Not yet established-to be commenced only if funding is available	Canceled. Not fiscally feasible.
Cost Effectiveness			
Not independently cost-effective, but the initial step in identifying appropriate mitigation actions			



4.3 Changes in Priorities

Plan-level priority changes are reflected in the changes to the plan-level goals shown in Chapter 3: Mitigation Strategy within the Main Plan document. As with many communities, the 2 highest priorities for the Woodcreek are now drought and floods. With devastating events that brought floods to the forefront of City government concerns in 2015 and 2016, the City also braces for the impact that a drought would have on the ever-growing County around them. Ranked as the fastest growing County population in the US, Hays County's water resources have become a concern.

Section 5: Approval and Adoption

5.1 Approval and Adoption Procedure

The procedures for approval and adoption are described in Chapter 4.1 of the main plan document.

Table WC.16, Municipal Jurisdiction Adoption Date

Municipality	APA Date	Adoption Date
Woodcreek		





Jurisdiction Adoption Documentation Placeholder

References

- American Legal Publishing Corporation. (1985, 05 01). City of Woodcreek, TX Code of Ordinances. Retrieved from Chapter 93: Fire Prevention and Prevention: [http://library.amlegal.com/nxt/gateway.dll/Texas/woodcreek_tx/cityofwoodcreektexascodeofordinances?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:woodcreek_tx](http://library.amlegal.com/nxt/gateway.dll/Texas/woodcreek_tx/cityofwoodcreektexascodeofordinances?f=templates$fn=default.htm$3.0$vid=amlegal:woodcreek_tx)
- American Legal Publishing Corporation. (2000, 08 23). City of Woodcreek, TX Code of Ordinances. Retrieved from Chapter 34: Emergency Management: [http://library.amlegal.com/nxt/gateway.dll/Texas/woodcreek_tx/cityofwoodcreektexascodeofordinances?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:woodcreek_tx](http://library.amlegal.com/nxt/gateway.dll/Texas/woodcreek_tx/cityofwoodcreektexascodeofordinances?f=templates$fn=default.htm$3.0$vid=amlegal:woodcreek_tx)
- American Legal Publishing Corporation. (2007, 01 10). City of Woodcreek, TX Code of Ordinances. Retrieved from Title XV: Land Usage: [http://library.amlegal.com/nxt/gateway.dll/Texas/woodcreek_tx/cityofwoodcreektexascodeofordinances?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:woodcreek_tx](http://library.amlegal.com/nxt/gateway.dll/Texas/woodcreek_tx/cityofwoodcreektexascodeofordinances?f=templates$fn=default.htm$3.0$vid=amlegal:woodcreek_tx)
- American Legal Publishing Corporation. (2009, 08 12). City of Woodcreek, Texas Code of Ordinances. Retrieved from Chapter 10: Rules of Construction: [http://library.amlegal.com/nxt/gateway.dll/Texas/woodcreek_tx/cityofwoodcreektexascodeofordinances?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:woodcreek_tx](http://library.amlegal.com/nxt/gateway.dll/Texas/woodcreek_tx/cityofwoodcreektexascodeofordinances?f=templates$fn=default.htm$3.0$vid=amlegal:woodcreek_tx)
- American Legal Publishing Corporation. (2013, 06 12). City of Woodcreek, TX Code of Ordinances. Retrieved from Chapter 32: Finance and Revenue; Taxation: [http://library.amlegal.com/nxt/gateway.dll/Texas/woodcreek_tx/cityofwoodcreektexascodeofordinances?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:woodcreek_tx](http://library.amlegal.com/nxt/gateway.dll/Texas/woodcreek_tx/cityofwoodcreektexascodeofordinances?f=templates$fn=default.htm$3.0$vid=amlegal:woodcreek_tx)
- American Legal Publishing Corporation. (2016, 09 22). City of Woodcreek, Texas. Retrieved from Code of Ordinances: [http://library.amlegal.com/nxt/gateway.dll/Texas/woodcreek_tx/cityofwoodcreektexascodeofordinances?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:woodcreek_tx](http://library.amlegal.com/nxt/gateway.dll/Texas/woodcreek_tx/cityofwoodcreektexascodeofordinances?f=templates$fn=default.htm$3.0$vid=amlegal:woodcreek_tx)
- American Lgal Publishing Corporation. (2011, 10 12). City of Woodcreek, Tx Code of Ordinances. Retrieved from Chapter 35: Fee Schedule: [http://library.amlegal.com/nxt/gateway.dll/Texas/woodcreek_tx/cityofwoodcreektexascodeofordinances?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:woodcreek_tx](http://library.amlegal.com/nxt/gateway.dll/Texas/woodcreek_tx/cityofwoodcreektexascodeofordinances?f=templates$fn=default.htm$3.0$vid=amlegal:woodcreek_tx)
- National Fire Protection Association. (2013, June). NFPA News & Research. Retrieved from Lightning Fires and Lightning Strikes: <http://www.nfpa.org/news-and-research/fire-statistics-and-reports/fire-statistics/fire-causes/lightning-fires-and-lightning-strikes>
- National Highway Traffic Safety Administration. (2017, 03 11). Traffic Safety Facts. Retrieved from Texas 2011-2015: <https://cdan.nhtsa.gov/SASStoredProcess/guest>
- National Oceanic and Atmospheric Administration. (2016). Historical Hurricane Tracks. Retrieved from National Oceanic and Atmospheric Administration Coastal Management: <https://coast.noaa.gov/hurricanes/>
- National Oceanic and Atmospheric Administration Storm Events Database. (2016, 12 01). National Centers for Environmental Information. Retrieved from Data Access: <https://www.ncdc.noaa.gov/data-access>
- Texas A&M Forest Service. (2016, 12 01). Wildfire Risk Assessment Portal. Retrieved from Public Viewer: <https://www.texaswildfirerisk.com/>
- Texas Department of Transportation. (2017, 03 11). Crash Records Information System. Retrieved from C.R.I.S Query: <https://cris.dot.state.tx.us/public/Query/#/public/welcome>

- Texas Natural Resources Information System. (2011). TNRIS Data Catalog Low Water Crossings. Retrieved from TNRIS: <https://tnris.org/data-catalog>
- Tornado Facts. (2016, 03 16). Tornado Facts and Information . Retrieved from Tornado Scale: <http://www.tornadofacts.net/tornado-scale.php>
- USGS Earthquake Hazard Program. (2015). USGS Earthquake Hazard Program. Retrieved from USGS: <https://earthquake.usgs.gov/data/>

APPENDIX

A

Outreach Documents

PUBLIC NOTICE

NOTICE OF A MEETING OF THE VILLAGE OF BEAR CREEK COMMISSIONERS

This notice is posted pursuant to the Texas Open Meetings Act (Vernons Texas Codes Ann. Gov. Code Ch. 551) The Village of Bear Creek Commissioners will hold a Commissioners' Meeting at 7:00 p.m. on Monday, December 19, 2016 at the Driftwood Volunteer Fire Department, 15850 Camp Ben McCulloch Road (FM 1826) Austin, Texas 78737. An open meeting will be held concerning the following subjects:

- 1) Call to Order**
- 2) Roll Call**
- 3) Citizens Comments will be taken from the audience on Non-Agenda related topics. No action may be taken by the City during Citizens Comments.**
- 4) Approval of Minutes from November 21, 2016.**
- 5) Discussion and possible action in regards to reviewing 2016 - 2017 budget and actual expenditures.**
- 6) Consent Agenda-the following may be acted upon in one motion. A Commissioner, Mayor or a Citizen may request items be pulled for separate discussion and/or action.**
 - A.** Approve payment to Hays Central Appraisal District \$94.32 for 1st QTR 2017. Invoice dated 12/15/16.
 - B.** Approve payment to Texas Municipal League Intergovernmental Risk Pool \$1,089.76. Invoice dated 12/1/2016.
- 7) New Business**
 - A.** Discussion and possible action regarding Texas Road Repair & Patches \$1,700.00 bid for road work on potholes and shoulders. (Brushwood)
 - B.** Discussion and possible action regarding Hays County Hazard Mitigation Plan and appointing a VOBC representative and alternate to attend meetings.
- 8) Old Business**
 - A.** Discussion and possible action on road system including: Volkert Inc engineering services, low water crossing and road signage. (Upham)

- B.** Discussion and possible action regarding an automated digital speed limit detection and warning sign. (Brushwood)
 - C.** Discussion and possible action regarding Village of Bear Creek Right-of -Way. (Upham).
 - D.** Discussion and possible action to change the Minimum Driveway Standards. (Burns)
 - E.** Discussion and possible action regarding detailed map of VOBC.
- 9) Announcements**
- A.** Next VOBC Commissioners Meeting is Monday, January 16, 2016 7:00 PM .
- 10) Adjournment**

Posted at 7:00 P.M. on the 16th day of December 2016 by the City Secretary of the Village of Bear Creek.



Kathryn Rosenbluth, City Secretary

**The Village of Bear Creek is committed to compliance with the American's With Disabilities Act.
Reasonable modifications and equal access to communications will be provided upon request;
contact Kathryn Rosenbluth at 512-217-3612.**

*** Go to VOBC Web Site : www.villbc.org to see agenda and other VOBC news ***



City Council Agenda Item Report

Date February 7th 2017

Contact – Mike Beggs, City of Buda, 512-312-2876

MBEGGS@CI.BUDA,TX.US

SUBJECT: Staff Report: Hays County 5 Year Hazard Mitigation Action Plan

1. **EXECUTIVE SUMMARY** – Requirements for updating the Hazard Mitigation Plan include reporting to City Council on the project effort as well as promoting public input and participation in the update effort. To educate the citizens about the Hazard Mitigation Action Plan update and receive public participation, the City has posted a link to an online questionnaire on all of the City's social media outlets. This questionnaire gives citizens an opportunity to provide input on the types of natural hazards experienced in their community and rank the hazard types they feel are most important to address in the update planning effort.
2. **BACKGROUND / HISTORY** – The Hazard Mitigation Plan is a document that outlines actions that can be taken to reduce or eliminate long-term risk to people and their property from hazards. It is an effective tool in identifying risks and vulnerabilities to natural hazards, allowing communities to take action to protect its people and infrastructure before disasters occur. These plans are required as a condition for receiving federal mitigation grant funding for projects. The plan is updated every 5 years and the current effective plan expires on November 28, 2017.
3. **STAFF'S REVIEW AND ANALYSIS** - N/A
4. **FINANCIAL IMPACT** - Hays County received a grant that would cover most of the HMAP update. Hays County its self will cover the remaining amount out of their operating budget.
5. **SUMMARY/CONCLUSION** - Staff has participated in two of the three Hazard Mitigation Meetings scheduled. Emergency Management Planners from all of the communities in Hays County that fall under the Hays County Plan have participated and reviewed the hazard data that was compiled through the various data collection tools and ranked the risk of each hazard that is being profiled in the updated plan. The next meeting is scheduled for some time in February, which will complete this portion of the update. The next step will be to send the proposed plan to the Texas Department of Emergency Management for review. Once the State approves the plan it then goes to FEMA for

their approval then back local entities for County and City Council approval which will complete the process.

6. PROS AND CONS

PROS: Having a good Hazard Mitigation Plan reduce loss of life and property by lessening the impact of disasters. It is most effective when implemented under a comprehensive, long-term mitigation plan. State, tribal, and local governments engage in hazard mitigation planning to identify risks and vulnerabilities associated with natural disasters, and develop long-term strategies for protecting people and property from future hazard events. Mitigation plans are key to breaking the cycle of disaster damage, reconstruction, and repeated damage.

CONS: A lack of planning to address identified hazards increases the difficulty and costs for responding to hazard occurrences. If Buda does not complete a Hazard Mitigation Plan, our community will not be eligible for federal assistance that may be available after a hazard occurs

- 7. ALTERNATIVES** - Under the Robert T. Stafford Act State, County, Local, and Indian Tribal entities are required to have an approved Hazard Mitigation Plan to be eligible to apply for and receive FEMA hazard mitigation funds.

- 8. RECOMMENDATION** – N/A



NOTICE OF MEETING OF THE
CITY COUNCIL
OF
BUDA, TX
6:30 PM - Tuesday, February 7, 2017
Council Chambers
121 S. Main Street
Buda, TX 78610

This notice is posted pursuant to the Texas Open Meetings Act. Notice is hereby given that a **Regular City Council Meeting** of the City of Buda, TX, will be held at which time the following subjects will be discussed and may be acted upon.

A. CALL TO ORDER

The City Council meeting will begin at 6:30 P.M.

B. INVOCATION

Jim Hays of the Buda Ministerial Alliance

C. PLEDGE OF ALLEGIANCE

D. ROLL CALL

E. PROCLAMATIONS

E.1. Dating Violence Awareness & Prevention Month February 2017 to be accepted by Kiara Nicholson, Prevention Educator, Hays-Caldwell Women's Center

[PROC TDVAM Buda.pdf](#)

F. PUBLIC COMMENTS

At this time, comments will be taken from the audience on non-agenda related topics for a length of time not to exceed three minutes per person. To address the City Council, please submit a Citizen's Comment form to the City Secretary prior to the start of the meeting. No action may be taken by the City Council during Public Comments.

G. CONSENT AGENDA

All matters listed under this item are considered to be routine by the City Council and will be enacted by one motion. There will not be separate discussion of these items. If discussion is desired by any Council Member on any item, that item will be removed from the consent agenda and will be considered separately.

G.1. Approval of the January 17, 2017 City Council Meeting Minutes (City Secretary Alicia Ramirez)

[2017-0117 DRAFT Minutes.pdf](#)

G.2. Consideration of adopting an Ordinance on second reading amending Article 18.02 Parks, Section 18.02.064 of the Code of Ordinances setting forth Regulated/Prohibited Items and Activities; providing for a penalty; providing for associated fees; providing for a severability clause and repealing conflicting ordinances or resolutions (Parks and Recreation Director Drew Wells)

[2017-0117 Open Carry.pdf](#)

[open carry parks \(updated cgc 1016\).pdf](#)

- G.3. Approval of a final plat for Sunfield Phase 2, Section 7, being 20.001 acres located between Firehorn Drive and Esperanza Drive (FP 15-18) (Assistant City Manager Chance Sparks)**

[2017-0207 Sunfield Ph2 Sec7 Final Plat Staff Report \(FP 15-18\).pdf](#)

[FP 15-18 Sunfield 2-7 BBI Recommend.pdf](#)

[Sunfield 2-7 Final Plat.pdf](#)

H. PUBLIC HEARINGS

- H.1. Public hearing on and discussion and consideration of the possible introduction of fluoride into the City's potable water system, including options to secure citizen approval or rejection of the same pursuant to Article 9 of the City of Buda's Charter (Water Specialist Brian Lillibridge)**

I. PRESENTATIONS

- I.1. Post-event report and discussion regarding the 2016 Budafest event (Tourism Director Lysa Gonzales)**

[Post event report 2016 Budafest - Final.pdf](#)

- I.2. Presentation on matters related to the impact of a potential City of Buda Property Tax Freeze or Exemption Change (Finance Director June Ellis)**

[Staff Report -Property Tax Freeze Impact.pdf](#)

[2017-0207 Property Tax Freeze Exemption Impact PPT.pdf](#)

J. REGULAR AGENDA

- J.1. Discussion and consideration of awarding a construction contract IFB 17-003 for installation of the Garlic Creek Force Main Valve Installation and authorizing the City Manager to execute said agreement and related documents (Public Works Director Mike Beggs)**

[Staff Report - Garlic Creek Forcemain Valve.pdf](#)

[GCFM Valve Bid Tab.pdf](#)

[Texas Ethics Form 1295 Certificate 100167903.pdf](#)

[TEC Form 1295.pdf](#)

[GCFM VALVE MANUAL-Section 2.pdf](#)

[IFB17-003.pdf](#)

[Greyback Utility.pdf](#)

irgw55@tceq.texas.gov 20161109_160601.pdf

[20161102 TCEQ Letter GCFM.PDF](#)

- J.2. Discussion and possible action of the first reading of an ordinance amending the Fiscal Year 2017 Budget Exhibit B "Fee Schedule" to reflect changes to the commercial solid waste fees (Assistant City Manager Micah Grau)**

[j2 Staff Report - Fee Schedule Amendment.pdf](#)

[j2 Ordinance - FY17 Budget Fee Schedule Amendment \(cg 2317\).pdf](#)

[Exhibit A - Exh B Amended#1 Fee Schedule 2016-17.pdf](#)

- J.3. Deliberation and possible action on adopting a Resolution setting dates, times and place for public hearings, authorizing and directing the publication of the notice of such public hearings, and directing the City Manager or his designee to prepare a service plan for approximately 29.383+/- acres of land out of the George Herder Survey, Abstract No. 239, located on Hillside Terrace approximately 400 feet east of its intersection with Green Meadows Lane (Assistant City Manager Chance Sparks)**

[2017-0207 East Green Meadows Annexation Staff Report.pdf](#)

[East Green Meadows Annexation Resolution.pdf](#)

[Exhibit A Metes and Bounds.pdf](#)

[Early Concept Drawing.pdf](#)

[East Green Meadows Annexation Location Map.pdf](#)

- J.4. Remove from table and consider a request for a special use permit for Self Storage in the Interstate Commercial/Office-Interstate Retail (C3/R3) zoning for the property located near the corner of Main Street and Firecracker Drive, being 7.751 acres of the Main Street East Commercial Subdivision (SUP 16-01) (Assistant City Manager Chance Sparks)**

[20170207 Action Item Staff Report SUP 16-01 Main Street East Self-Storage.pdf](#)

[S 16-01 Future Land Use Map.pdf](#)

[S 16-01 zoning Map.pdf](#)

[Applicant Letter of Intent SUP 16-01.pdf](#)

[Applicant Site Plan and Renderings.pdf](#)

[Economic Development Agreement - City of Buda and 2428 Partners \(reduced without metes & bounds\).pdf](#)

- J.5. Consideration and possible action to appoint a City Council Member to the IT Committee (City Secretary Alicia Ramirez)**

[I4 Council Committee Appointment Staff Report.pdf](#)

K. EXECUTIVE SESSION

- K.1. Council will recess its open session and convene in executive session pursuant to Government Code §551.071 to deliberate and seek legal advice from the City Attorney regarding the law and procedures under the Charter related to referendums; §551.071 to deliberate and seek legal advice from the City Attorney regarding the law and procedure applicable to a Petition for Creation of Emergency Services District; and, §551.071 Consultations with City Attorney to seek advice regarding City Council procedures and related matters.**

L. CONVENE INTO REGULAR SESSION AND TAKE ACTION, IF ANY, ON MATTERS DISCUSSED IN EXECUTIVE SESSION.

- L.1. Discussion and possible action to implement the City Council Meeting Rules of Procedure/Order and related matters (City Attorney)**

[Summary report Rules of Procedure.pdf](#)

- L.2. Presentation, discussion and possible action in regard to a request for City of Buda consent to the inclusion of portions of its extraterritorial jurisdiction (ETJ) in the election for creation of a new Travis County Emergency Services District No. 15 (Assistant City Manager Chance Sparks)**

[20170207 Travis County ESD 15 Proposal Staff Report.pdf](#)

[ESD 15 Buda ETJ Map.pdf](#)

[Overall ESD 15 Map.pdf](#)

[ESD No 15 Petition \(signature pages redacted\).pdf](#)

M. STAFF REPORT

- M.1. Update on the draft Hays County 5 Year Hazard Mitigation Action Plan (Public Works Director/Emergency Management Coordinator Mike Beggs)**

[Agenda Report HMAP Final210517.pdf](#)

[Hays Risk Assessment Phase 2 Newsletter.pdf](#)

- M.2. Staff Report regarding 1st Quarter Reports for the Human Services Funding Grants (City Secretary Alicia Ramirez)**

[Human Services Grants Q1 Staff Report.pdf](#)

[Agency Reports.pdf](#)

- M.3. Update on 2014 Bond Propositions (Project Manager Ray Creswell; City Engineer John Nett; Director of Parks & Recreation Drew Wells)**

[2014BudaBondStaffReport_02072017.pdf](#)

N. CITY MANAGER'S REPORT

Hays County Hazard Mitigation Plan

2014 Bond Program, Capital Improvement Projects, Developments, Drainage Projects, Engineering Department, Finance Department, General/Special Election, Grant related Projects, Human Resources, Law Enforcement, Legislative Update, Library Projects, Main Street Program, Parks & Recreation Department, Planning Department, Road Projects, Status-Future Agenda Rqst, Special Projects, Tourism Projects, Transportation, Wastewater Projects, and Water Projects

O. CITY COUNCIL'S BOARD AND COMMITTEE REPORTS

P. ITEMS OF COMMUNITY INTEREST

P.1. Municipal Site Tree Relocation (Public Information Officer David Marino)

Q. CITY COUNCIL REQUESTS FOR FUTURE AGENDA ITEMS

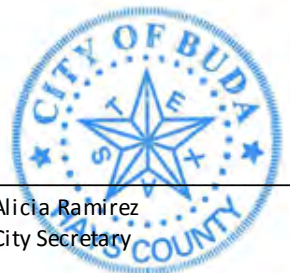
Q.1. Update on Pending Items requested by City Council

[Pending Items.pdf](#)

R. ADJOURNMENT

Requests for accommodations must be made 48 hours prior to the meeting. Please contact the City Secretary at (512) 312-0084, or FAX (512) 312-1889 for information or assistance. I, the undersigned authority, do hereby certify that the above Notice of Meeting of the Governing Body of the City of Buda, was posted on the bulletin board in front of Buda City Hall, which is readily accessible to the public at all times, by 5:00 pm on February 3, 2017.

/s/ _____
Alicia Ramirez
City Secretary



Council Chambers are set up to publicly broadcast meetings. You may be audio and video recorded while in this facility.

In accordance with Article III, Section 3.10, of the Official Code of the City of Buda, the minutes of this meeting consist of the preceding Minute Record and the Supplemental Minute Record. Details on Council meetings may be obtained from the City Secretary's Office, or video of the entire meeting may be downloaded from the website. (Portions of the Supplemental Minute Record video tape recording may be distorted due to equipment malfunction or other uncontrollable factors.)

The City Council may retire to executive session any time between the meeting's opening and adjournment for the purpose of consultation with legal counsel pursuant to Chapter 551.071 of the Texas Government Code; discussion of personnel matters pursuant to Chapter 551.074 of the Texas Government Code; deliberation regarding real property pursuant to Chapter 551.072 of the Texas Government Code; deliberation regarding economic development negotiations pursuant to Chapter 551.087 of the Texas Government Code; and/or deliberation regarding the deployment, or specific occasions for implementation of security personnel or devices pursuant to Chapter 551.076 of the Texas Government Code. Action, if any, will be taken in open session.

This agenda has been reviewed and approved by the City's legal counsel and the presence of any subject in any Executive Session portion of the agenda constitutes a written interpretation of Texas Government Code Chapter 551 by legal counsel for the governmental body and constitutes an opinion by the attorney that the items discussed therein may be legally discussed in the closed portion of the meeting considering available opinions of a court of record and opinions of the Texas Attorney General known to the attorney. This provision has been added to this agenda with

the intent to meet all elements necessary to satisfy Texas Government Code Chapter 551.144(c) and the meeting is conducted by all participants in reliance on this opinion.

Attendance by Other Elected or Appointed Officials: It is anticipated that members of other governmental bodies, and/or city boards, commissions and/or committees may attend the meeting in numbers that may constitute a quorum of the body, board, commission and/or committee. Notice is hereby given that the meeting, to the extent required by law, is also noticed as a possible meeting of the other body, board, commission and/or committee, whose members may be in attendance, if such numbers constitute a quorum. The members of the boards, commissions and/or committees may be permitted to participate in discussions on the same items listed on the agenda, which occur at the meeting, but no action will be taken by such in attendance unless such item and action is specifically provided for on an agenda for that body, board, commission or committee subject to the Texas Open Meetings Act.

[CLOSE](#)

CITY OF KYLE



Notice of Regular City Council Meeting

Kyle City Hall, 100 W. Center St.,
Kyle, Texas 78640

Notice is hereby given that the governing body of the City of Kyle, Texas will meet at 7:00 PM on January 17, 2017, at Kyle City Hall, 100 W. Center St., Kyle, Texas 78640, for the purpose of discussing the following agenda.

Posted this 13th day of January, 2017, prior to 7:00 p.m.

I. Call Meeting To Order

II. Approval of minutes

1. [City Council Regular Meeting Minutes - January 3, 2017. ~ Jennifer Vetrano, City Secretary](#)

III. Citizen Comment Period with City Council

The City Council welcomes comments from Citizens early in the agenda of regular meetings. Those wishing to speak are encouraged to sign in before the meeting begins. Speakers may be provided with an opportunity to speak during this time period on any agenda item or any other matter concerning city business, and they must observe the three-minute time limit.

IV. Presentation

2. [Progress report on all road bond projects including latest project cost estimates. ~ Leon Barba, P.E., City Engineer](#)
3. [Presentation on Hays County Hazard Mitigation Plan Update. ~ Kathy Roecker, Stormwater Management Plan Administrator](#)

V. Consent Agenda

4. Approve Change Order No. 1 to GUERRA UNDERGROUND, LLC, Austin, Texas, for the Tenorio Addition Wastewater System Rehabilitation Project, Phase One B in an amount not to exceed \$35,803.36 for a total contract amount not to exceed \$479,743.36 for additional labor and equipment caused by a restriction of work hours due to school related traffic. ~ Leon Barba, P.E., City Engineer
5. Award a contract in an amount not to exceed \$179,500.00 to TRI-STATE COATINGS, Wadena, MN, lowest and most responsible bidder, to perform all work required for the Yarrington Rd. Tank, the FM 1626 Tank and on the Downtown Elevated Tank. ~ Leon Barba, P. E., City Engineer
6. Award a contract in an amount not to exceed \$64,200.00 to TTE, LLC., Spicewood, TX, lowest and most responsible bidder, to perform all electrical work for installation of SCADA antenna and equipment installation and sunscreens at various locations. ~ Leon Barba, P.E., City Engineer
7. (Second Reading) An Ordinance adopting the land use assumptions, capital improvements plan, and establishing an updated water impact fee totaling \$3,535 per living unit equivalent (LUE) and an updated wastewater impact fee totaling \$2,826 per LUE, amending Ordinance No. 298-2, and establishing an effective date. ~ Perwez A. Moheet, CPA, Director of Finance
8. (Second Reading) An Ordinance Amending the City of Kyle Code of Ordinances, Chapter 53, Zoning; specifically, Article I, Section 53-5 (Definitions); and Article II, Division 1, Section 53-33 (General Requirements and Limitations); and Article II, Divisions 2, 3, 4 and 5, as well as creating a new division and re-numbering existing divisions; and prior Ordinance 824 (Providing standards for determining a front wall for the purposes of establishing garage setback). ~ Howard J. Koontz, Director of Planning and Community Development

Planning and Zoning Commission voted 6-0 to recommend approval with the condition outlined in staff memo.
9. Statutorily disapprove Plum Creek Phase 2, Section 1 - Final Plat (FP-16-015) 89-739 acres; 312 single family, 1 school, 1 amenity, 2 open space and 7 easement lots located on the northeast corner of Kohlers' Crossing and FM 2770. ~ Howard J. Koontz, Director of Planning and Community Development.

P&Z voted 5-0 to statutorily disapprove the final plat to meet the 30 day statutory requirement.
10. Statutorily disapprove Plum Creek Phase 1, Section 6B-3 - Final Plat (FP-17-001) 2.848 acres; 20 residential lots located immediately south of Hellman

and east of FM 2770. ~ Howard J. Koontz, Director of Planning and Community Development.

Planning and Zoning Commission vote 5-0 to statutorily disapprove to meet the 30 day statutory requirement.

11. Approve a Resolution ratifying the authorization for the submission of a reimbursement grant application to the Office of the Governor, Criminal Justice Division, for the purpose of funding Texas Conversion to the National Incident Based Reporting System for the Fiscal Year 2017. ~ Jeff Barnett, Chief of Police
12. Authorize the transfer of ownership of a 1988 GMC Armored Truck, VIN 1GDJ7D1F2JV508903, to the Pearsall Independent School District for the express purpose of law enforcement utilization. ~ Jeff Barnett, Chief of Police
13. Authorize the disposal of expired bullet resistant vests, having no current value or use, from the police department's inventory. ~ Jeff Barnett, Chief of Police
14. Declaring certain items from the Information Technology Department as surplus and also directing the appropriate city staff to advertise and sell the items in accordance with city policy. ~ Jerry Hendrix, Chief of Staff

VI. Consider and Possible Action

15. [Postponed 1/3/2017] (First Reading) An Ordinance amending Chapter 53 (Zoning) of the City of Kyle, Texas, for the purpose of rezoning approximately 52.990 acres of land from Single Family Residential-2 'R-1-2' to Single Family Detached Residential 'R-1-A' for property located on the north side of Bebee Road, 1/4 mile west of Dacy Lane, in Hays County, Texas. (The Meadows at Kyle II, Ltd. (Sunset Hills) - Z16-009). ~ Howard J. Koontz, Director of Planning and Community Development

Planning and Zoning Commission voted 5-0 to postpone recommendation until the February 14th P&Z meeting.

 - PUBLIC HEARING
16. [Postponed 1/3/2017] (First Reading) An Ordinance amending Chapter 53 (Zoning) of the City of Kyle, Texas, for the purpose of rezoning approximately 68.5 acres of land from Single Family Residential-2 "R-1-2" and rezone approximately 10.38 acres of land from Central Business District-1 "CBD-1" to Single Family Detached Residential "R-1-A" for property located on the west side of Scott Street at W. Third Street, in Hays County, Texas.

(Blanton Family Limited Partnership - Z-16-010). ~ Howard J. Koontz, Director of Planning and Community Development

Planning and Zoning Commission voted 5-0 to postpone recommendation until the February 14th P&Z meeting.

• PUBLIC HEARING

17. [Postponed 1/3/2017] (First Reading) An Ordinance amending Chapter 53 (Zoning) of the City of Kyle, Texas, for the purpose of rezoning approximately 7.26 acres of land from Single Family Residential "R-1" to Single Family Detached Residential "R-1-A" for property located on the southwest corner of Zapata Street and W. Hays Street, in Hays County, Texas. (Thomas Kaminski - Z-16-011). ~ Howard J. Koontz, Director of Planning and Community Development

Planning and Zoning Commission voted 5-0 to postpone recommendation until the February 14th P&Z meeting.

• PUBLIC HEARING

18. (First Reading) An Ordinance to assign original zoning to approximately 4.01 acres of land from Agriculture 'AG' to Warehouse District 'W' for property located at 1381 Goforth Road. (John R. and Gayla Simon - Z-16-013). ~ Howard J. Koontz, Director of Planning and Community Development

Planning and Zoning Commission voted 3-2 to recommend to assign original zoning of Retail Service District 'RS'.

• PUBLIC HEARING

19. Consider and possible action to approve a Municipal Hotel Occupancy Tax Funding Agreement for Tourism and Promotional Services with the Kyle Area Chamber of Commerce. ~ J. Scott Sellers, City Manager
20. Consider request to ammend scope of work and reimburse Live Oak Masonic Lodge for the Downtown Revitalization Grant they were awarded on June 21, 2016 in the amount of \$3,138.06. ~ Diana Torres, Director of Economic Development
21. Approve a Resolution authorizing the negotiation of an agreement with HALFF ASSOCIATES, INC., Austin, Texas, to provide services related to creating a new Drainage Master Plan. ~ Leon Barba, P.E., City Engineer
22. Consider and possible action to approve up to \$100,000.00 for proposed drainage improvements to the existing drainage culvert on FM 2770 just north of Hellman. ~ Scott Sellers, City Manager

23. (First Reading) Approve an Ordinance Granting Michael J. Blevins, d/b/a On Tyme Taxi & Courier Service, a Franchise to Provide Taxi Services within the Boundaries of the City of Kyle, Texas; providing an agreement prescribing conditions, terms, and regulations governing the operation of the taxi services; providing penalties for noncompliance with franchise; providing for codification; providing for severability; providing for public notice pursuant to the open meetings act; establishing an effective date; and making such other findings and provisions related hereto. ~ Jerry Hendrix, Chief of Staff
24. (Second Reading) An Ordinance of the City of Kyle, Texas Code of Ordinances amending Chapter 5, Animals, Article III. Animal Protection and Article IX. Animal Care and Control; providing a repealing clause; providing a savings clause; providing a severability clause; providing for publication; and setting an effective date. ~ Jeff Barnett, Chief of Police
25. Consider and possible action to approve an Employment Agreement with City Manager, Scott Sellers. ~ Todd Webster, Mayor

VII. City Manager's Report

26. Update on various capital improvement projects, road projects, building program, and/or general operational activities where no action is required. ~ J. Scott Sellers, City Manager
 - WWTP Grant Award in the amount of \$132,215.00

VIII. Executive Session

27. Pursuant to Chapter 551, Texas Government Code, the City Council reserves the right to convene into Executive Session(s) from time to time as deemed necessary during this meeting. The City Council may convene into Executive Session pursuant to any lawful exception contained in Chapter 551 of the Texas Government Code including any or all of the following topics.
 1. Pending or contemplated litigation or to seek the advice of the City Attorney pursuant to Section 551.071
 - Jesse Espinoza Appeal Update and Associated Matters
 2. Possible purchase, exchange, lease, or value of real estate pursuant to Section 551.072.
 3. Personnel matters pursuant to Section 551.074.
 4. Economic Development negotiations pursuant to Section 551.087.
 - Project Just Peachy
 - Project Cherry Red
 - Project Sunset Orange
 - Project Teal
 - Project Pacific Blue
28. Take action on items discussed in Executive Session.

IX. ADJOURN

At any time during the Regular City Council Meeting, the City Council may adjourn into an Executive Session, as needed, on any item listed on the agenda for which state law authorizes Executive Session to be held

*Per Texas Attorney General Opinion No. JC-0169; Open Meeting & Agenda Requirements, Dated January 24, 2000: The permissible responses to a general member communication at the meeting are limited by 551.042, as follows: "SEC. 551.042. Inquiry Made at Meeting. (a) If, at a meeting of a government body, a member of the public or of the governmental body inquires about a subject for which notice has not been given as required by the subchapter, the notice provisions of this subchapter, do not apply to: (1) a statement of specific factual information given in response to the inquiry; or (2) a recitation of existing policy in response to the inquiry. (b) Any deliberation of or decision about the subject of the inquiry shall be limited to a proposal to place the subject on the agenda for a subsequent meeting."



City of San Marcos

630 East Hopkins
San Marcos, TX 78666

Regular Meeting Agenda - Final City Council

Tuesday, February 7, 2017

5:30 PM

City Council Chambers

630 E. Hopkins

- I. Call To Order
- II. Roll Call
- III. Invocation
- IV. Pledges Of Allegiance - United States And Texas

5:30PM PRESENTATIONS

- 1. Receive presentations from Strategic Government Resources (SGR) and Waters & Company, and hold discussion regarding the use of an executive search firm for the City Manager position, and provide direction to Staff.
- 2. Receive a Staff update regarding the Hays County Hazard Mitigation Plan, and provide direction to Staff.

6:00 PM

- V. 30 Minute Citizen Comment Period

CONSENT AGENDA

THE FOLLOWING ORDINANCES, RESOLUTIONS AND OTHER ITEMS MAY BE ACTED UPON BY ONE MOTION. NO SEPARATE DISCUSSION OR ACTION ON ANY OF THE ITEMS IS NECESSARY UNLESS DESIRED BY A COUNCIL MEMBER OR A CITIZEN, IN WHICH EVENT THE ITEM SHALL BE CONSIDERED IN ITS NORMAL SEQUENCE AFTER THE ITEMS NOT REQUIRING SEPARATE DISCUSSION HAVE BEEN ACTED UPON BY A SINGLE MOTION.

- 3. Consider approval, by motion, of the following meeting Minutes:
 - January 13, 2017 Packet Meeting Minutes
 - January 17, 2017 Regular Meeting Minutes
 - January 23, 2017 Community Improvement Taskforce Recommendation Workshop Meeting Minutes
- 4. Consider approval of Ordinance 2017-02, on the second of two readings, creating a Designated Permit Area under Section 82.189 of the San Marcos City Code that allows parking by permit only on both sides of the 1400 block Meadow Pkwy between Holland

St. and Elm Hill Ct., and on both sides of 100 block Cypress Ct. between Meadow Pkwy and the end of the street; amending the Traffic Register to reflect such Designated Permit Area; and providing for an effective date.

5. Consider approval of Ordinance 2017-03, on the second of two readings, amending Section 4.3.1.1 of the Land Development Code including the legend used to interpret the Land Use Matrix to add a new category "L" for Limited Uses; amending the Land Use Matrix in Section 4.3.1.2 of the Land Development Code to establish Short-Term Rentals as a new land use; amending Chapter 4, Article 3 of the Land Development Code to create a new Division Five to establish regulations for Short-Term Rentals; providing a savings clause; providing for the repeal of any conflicting provisions; and providing an effective date.
6. Consider approval of Ordinance 2017-04, on the second of two readings, amending chapter 34, article 7 of the San Marcos City Code known as the Rental Nuisance Abatement Code to provide for the annual registration of short-term rentals; providing a savings clause; providing for the repeal of any conflicting provisions; and providing an effective date.
7. Consider approval of Ordinance 2017-05, on the second of two readings, adopting fees to be charged by the City for various city services, including changes to some existing fees and the addition of new fees; providing a savings clause; providing for the repeal of any conflicting provisions; and providing an effective date.
8. Consider approval of Resolution 2017-17R, approving the award of a construction contract to Dalrymple Gravel and Contracting Company, Inc. for the River Road Pavement and Bank Stabilization Project (IFB 217-051) in the amount of \$328,300.00 contingent upon the contractor's timely submission of sufficient bonds and insurance in accordance with the City's construction contract documents for the project; authorizing the Interim City Manager or her designee to execute all contract documents on behalf of the City and declaring an effective date.
9. Consider approval of resolution 2017-18R, authorizing the submission of a grant application to the Office of the Governor, Criminal Justice Division, Victims of Crime Assistance (VOCA) program to allow for the expansion of the Victim Services program of the Police Department, authorizing the City Manager or her designee to execute all documents related to the application, and declare an effective date.
10. Consider approval of Resolution 2017-19R, approving the purchase of fourteen 2017 Ford Utility Police Interceptor vehicles for the Police Department from Sam Pack's Five Star Ford through the Houston-Galveston Area Council of Governments Cooperative Purchasing Program Contract #VE11-15 for current model cars, light trucks and police motorcycles in the total amount of \$383,677.38; authorizing the Interim City Manager or her designee to execute the appropriate purchasing documents on behalf of the City and declaring an effective date.
11. Consider approval of Resolution 2017-20R, awarding an annual contract to Texas Electric Cooperative for the provision of Residential Electric Meters (IFB 217-028) for the Public Services Department-Electric Utilities Division in the estimated annual amount of \$345,420.00; authorizing the Interim City Manager or her designee to

execute the appropriate purchasing documents on behalf of the City; and declaring an effective date.

12. Consider approval of Resolution 2017-21R, confirming the Interim City Manager's appointment of George R. Landry to the San Marcos Civil Service Commission; and declaring an effective date.
13. Consider approval of Resolution 2017-22R approving an Interlocal Agreement between the City of San Marcos and the State of Texas, acting by and through its agency, the Division of Community Development & Revitalization within the Texas General Land Office, for administrative assistance in connection with the Disaster Recovery Funds received by the City from the U.S. Department of Housing and Urban Development in the total not-to-exceed amount of \$100,000.00; authorizing the Interim City Manager or her designee to execute this agreement on behalf of the City; and declaring an effective date.

PUBLIC HEARINGS - 7:00 PM

14. 7:00 Receive a Staff presentation and hold a Public Hearing to receive comments for or against a request by Kathryn C Dillon to appeal a decision made at the January 10, 2017 Planning & Zoning Commission meeting, in which the Planning & Zoning Commission granted a Conditional Use Permit (CUP-16-34) for the sale of mixed alcoholic beverages for on-site consumption to Gumby's Pizza and Wings at 312 West Hopkins Street.
15. 7:00PM Hold a Public Hearing to receive comments for or against the voluntary annexation submitted by Bill Fisher, on behalf of Jaster Edmund Hays County Partnership, of a 17.45 +/- acre tract of land out of the Cyrus Wickson Survey, Abstract No. 474, Hays County, Texas, generally located on East McCarty Lane, northwest of the intersection with Rattler Road.

NON-CONSENT AGENDA

16. Consider Ordinance 2017-06, on the first of two readings, calling a Bond Election for Public Safety Facilities in the aggregate principal amount of \$17,450,000 and Library Improvements in the aggregate principal amount of \$14,750,000 for May 6, 2017; establishing Early Voting Locations and Polling Places for this Election; making provisions for conducting the Election; and resolving other matters related to such Election; and providing an effective date.
17. Consider approval of Resolution 2017-23R, approving an addendum to the Valet Parking License Agreement with Austin Street Tavern L.L.C doing business as AquaBrew Brewery & Beer Garden, that extends the term of the license agreement for one additional year; authorizing the Interim City Manager to execute this addendum on behalf of the City; and declaring an effective date.
18. Hold discussion and make annual appointments to the various Boards and Commissions, to wit:
A) Airport Commission
B) Animal Shelter Advisory Committee

- C) Arts Commission
- D) Cemetery Commission
- E) Citizens Utility Advisory Board
- F) Comprehensive Master Plan Oversight Committee
- G) Construction Board of Appeals
- H) Convention and Visitors Bureau Board
- I) Economic Development San Marcos Board
- J) Ethics Review Commission
- K) Historic Preservation Commission
- L) Housing Authority Board
- M) Human Services Advisory Board
- N) Library Board
- O) Main Street Advisory Board
- P) Neighborhood Commission
- Q) Parks and Recreation Board
- R) Planning and Zoning Commission
- S) San Marcos Commission on Children & Youth
- T) San Marcos Youth Commission
- U) Senior Citizen Advisory Board
- V) Veteran's Affairs Advisory Committee
- W) Zoning Board of Adjustment

EXECUTIVE SESSION

NOTE: The City Council may adjourn into Executive Session to consider any item listed on this agenda if a matter is raised that is appropriate for Executive Session discussion. An announcement will be made of the basis for the Executive Session discussion. The City Council may also publicly discuss any item listed on the agenda for Executive Session.

19. Executive Session in accordance Section 551.074 of the Texas Government Code - Personnel Matters - to discuss and deliberate regarding the City Manager Vacancy and compensation of the Interim City Manager; and in accordance with § 551.087 - Economic Development: to receive an update regarding Project Enfield.
20. Consider adoption or direction to Staff on matters discussed in Executive Session.

VI. Question and Answer Session with Press and Public.

This is an opportunity for the Press and Public to ask questions related to items on this agenda.

VII. Adjournment.

POSTED ON WEDNESDAY, FEBRUARY 1, 2017 AT 5:45PM

JAMIE LEE CASE, CITY CLERK

Notice of Assistance at the Public Meetings

The City of San Marcos does not discriminate on the basis of disability in the admission or access to its services, programs, or activities. Individuals who require auxiliary aids and services for this meeting should contact the City of San Marcos ADA Coordinator at 512-393-8000 (voice) or call Texas Relay Service (TRS) by dialing 7-1-1. Requests can also be faxed to 855-461-6674 or sent by e-mail to ADArequest@sanmarcostx.gov

City of Wimberley
City Hall, 221 Stillwater
Wimberley, Texas 78676
Minutes of Regular Meeting of City Council
January 5, 2017 at 6:00 p.m.

City Council meeting called to order at 6:00 p.m. by Mayor Mac McCullough.

Former Hays County Constable Darrell Ayres gave the Invocation and Mayor McCullough and Council led the Pledge of Allegiance to the United States and Texas flags.

Councilmembers Present: Mayor Mac McCullough, Councilmembers Bob Dussler, Craig Fore, Sally Trapp, Gary Barchfeld, and John White.

Staff Present: City Administrator Don Ferguson & City Secretary Cara McPartland

Proclamations

- A. Proclamation of the City Council of the City of Wimberley, Texas, recognizing former Hays County Precinct Three Constable Darrell W. Ayres for his years of dedicated public service to the residents of Wimberley, Texas

Mayor McCullough presented the proclamation to Darrell Ayres, who expressed appreciation for everyone's support, highlighted his professional experience, and said it has been a great honor to serve the citizens of the Wimberley Valley and Hays County.

- B. Proclamation of the City Council of the City of Wimberley, Texas, recognizing former Hays County Elections Administrator Joyce Cowan for her years of dedicated public service to the residents of Wimberley, Texas

Mayor McCullough presented the proclamation to Joyce Cowan, who spoke of her love and admiration for this community and her staff and of all of the friends she has made over the years. Mayor McCullough and Ms. Cowan spoke of Wimberley's typically high voter turnout.

City Administrator Ferguson stated the City has been blessed to work with these two consummate professionals.

- C. Proclamation of the City Council of the City of Wimberley, Texas, recognizing Hugh Campbell for his years of dedicated public service to the Village Store in Wimberley, Texas

Mayor McCullough read the proclamation and advised he would deliver the proclamation to Mr. Campbell.

Citizens Communications

Councilmember Barchfeld moved to approve the ordinance ordering a General Election on May 6, 2017 for the purpose of electing Council Members for Places One, Three and Five of the City of Wimberley City Council, as presented. Councilmember Fore seconded. Motion carried on a vote of 5-0.

5. Discussion and Possible Action

- A. Discuss and consider possible action approving a proposed election services contract with the Hays County Elections Administrator to conduct the May 6, 2017 General Election for the City of Wimberley, Texas. *(City Administrator)*

City Administrator Ferguson recommended approval of the contract, which includes estimated costs for conducting the election.

Councilmember Barchfeld moved to approve the election services contract, as presented. Councilmember White seconded. Motion carried on a vote of 5-0.

- B. Discuss and consider possible action regarding a proposal to relocate the Wimberley Farmers Market to the Wimberley Community Center parking lot. *(Place Three Councilmember Sally Trapp)*

This item was heard after the Consent Agenda.

Councilmember Trapp spoke of a recent meeting with a Farmers Market representative and City Administrator Ferguson provided details about possible relocation to the more spacious asphalt parking area near the eastern edge of the Community Center adjacent to the Patsy Glenn Refuge, which would not interfere with events at the Community Center. City Administrator Ferguson advised that no fee is proposed for use of the subject portion of the parking lot. He noted that the Farmers Market would be required to provide proof of liability insurance with the City listed as an additional insured party.

Farmers Market Manager Diane Bell said she is working on acquiring the required additional insurance and asked about the need for variances to place temporary signs. City Administrator Ferguson said that no variance would be needed for placing such signage. Ms. Bell felt the proposed location provides more room, poses less traffic issues, and provides access to electricity for music events during the Market. Councilmember White suggested Ms. Bell check with her insurance company on providing the additional insurance at no charge.

Councilmember Trapp moved to approve the relocation of the Wimberley Farmers Market to the Wimberley Community Center parking lot, at no cost to the Farmers Market, including allowed temporary signage and proof of additional insurance. Councilmember White seconded. Motion carried on a vote of 5-0.

- C. Discuss and consider possible action regarding a proposal from the City of Wimberley Hotel Occupancy Tax Advisory Committee to reduce the City's Hotel Occupancy tax

rate. (*Hotel Occupancy Tax Advisory Committee Chairman Mark Bursiel & Place Three Councilmember Sally Trapp*)

This item was heard after Agenda Item 5A.

Hotel Occupancy Tax Advisory Committee Chairman Mark Bursiel began with an update on the final report of Wimberley Alive event, which he said got an “A” for effort; however, the Committee determined there was no increase in overnight lodging created by this event. He stated the Wimberley Alive applicants did not meet benchmarks or requirements, which prohibits them from applying for any future funding within the next calendar year. He said discussion at the last Committee meeting agreed to put the applicants on probation. He referenced a presentation given to Council and spoke of the need for a vision to guide the Committee. He said collections have by far exceeded allocations/pay-outs to date. He stated the Committee wishes to explicitly express this is not an attempt to “kill the tax,” but simply to “take it to zero at the current time.” He said we are taxing people coming to Wimberley and they are not getting the benefit from it. Chairman Bursiel advised the Committee voted 6-1 to recommend reducing the tax to zero percent (0%) effective January 31, 2017.

Robbie Walker of Hills of Texas Lodging distributed a handout to Council that included charts indicating that the HOT has driven overnight stays to areas outside the City. He noted specific lodging businesses that have been negatively impacted by the HOT and favored reducing the tax rate to 0%. He cited similar problems experienced by other cities regarding spending of HOT revenues, particularly due to the “heads in beds” requirement that must be met. He favored helping local lodging and figuring out a plan to bring more people to town.

Discussion addressed the approximate loss of 25% of vacation rentals due to the flood; estimated number of rental owners not paying State and/or City HOT; discounting of rental rates by lodging owners due to HOT collection; perception of Wimberley since the flood as not being “open for business”; perception of Wimberley as “anti-tourism”; divisiveness of the HOT; differing opinions on a recent USA Today article on Wimberley; and similar problems with HOT experienced by other cities.

Councilmember White said the City has “this pot of money sitting there and making it grow” without a vision on how to spend it. He said the more the money grows the more tempting it will be to find a reason to spend the money. He cited the City of Austin’s allocation of most HOT money to the convention bureau.

Chairman Bursiel spoke of phone calls commenting on how HOT funds should be spent, which would not meet funding requirements and the lack of an oversight mechanism for expenditures.

Councilmember Barchfeld thanked the Committee and asked Mr. Bursiel if the Committee would stay intact if the tax rate was reduced to 0% and whether the Committee would still be considering ways of spending the HOT collections. Chairman Bursiel answered affirmatively to both questions. Councilmember Barchfeld asked Chairman Bursiel his thoughts on whether revenue would go up if the HOT were reduced. Chairman Bursiel replied affirmatively, but said it will be a slow process, “because the stigma is there.” He likened the HOT as “robbing Peter to

pay Paul,” which takes discretionary income from travelers. He said the people complaining about not having tourism are the very people that rely on tourism dollars (the shop owners, artists, the players). He stated taking tourists’ money before they even get here leaves less money for them to spend while here.

Councilmember Barchfeld asked Chairman Bursiel if time collecting the tax drains his business and Mr. Bursiel replied affirmatively. Mr. Bursiel said it takes him easily six hours to prepare tax reports and detailed the process to collect and report the tax, which he said does not benefit his business. He said the amount of work is the same regardless, whether the HOT rate is 5% or 1%. Mr. Bursiel said the lodging group would not have a problem with the HOT, if there were a plan to spend the money.

Councilmember Dussler expressed his opposition to suspending the HOT while considering various issues. He said the HOT is doing exactly what we intended – building a pool of capital for Wimberley to use in promoting tourism. He stated that we are the ones who are struggling with how to deploy the capital. Councilmember Dussler felt there is no reason to needlessly penalize our efforts in building a pool of capital while we are considering the best way to deploy it. He analogized it to suspending the City’s sales tax collections while Council is working on the budget. He said at the very least, Council should hold off on any action on the HOT until Council has completed its workshop with the HOT Advisory Committee on January 31, 2017, when he hoped a clear vision and plan for Wimberley tourism could be developed.

Councilmember Fore agreed with the Committee’s recommendation and said he was not in favor of the HOT from the beginning, which was without a plan on how to spend the money.

Councilmember Barchfeld questioned whether the Committee would advocate reducing the HOT rate to 0% now, or waiting until after the upcoming Council/Committee workshop. Chairman Bursiel stated he advocates following the Committee’s recommendation. Councilmember Barchfeld recognized the divisiveness of this issue and favored reducing the HOT rate to 0%, if it will help bring everyone together as a group.

Councilmember Trapp thanked the Committee and said their decorum and professionalism was always extremely high. She did not feel the recommendation to reduce the tax rate to 0% was “giving up” (referring to former Mayor Thurber’s prior comments). She said there is a difference between giving up and being fiduciarily responsible and endorsed the Committee’s recommendation.

Mayor McCullough asked audience member Lois Mahoney if she had a comment. Ms. Mahoney stated she agreed with Mr. Bursiel and was not against the tax, but a plan was needed to spend tax revenues.

Phil Collins reiterated his previous offer to pay for a consultant who can speak to all the details on the HOT and see if there is any solution that can work for our city.

Councilmember Barchfeld questioned if there could be a consultant’s presentation at the upcoming January 31st Council/HOT Committee workshop. City Administrator Ferguson

directed Council's attention to written comments (*full text attached to these minutes*) submitted by lodging owners Shellye Arnold and Tina Sabuco, expressing opposition to the City's HOT.

Mayor McCullough entertained a motion.

Councilmember Trapp moved to approve reducing the City's Hotel Occupancy tax rate to 0%, effective January 31st, as recommended by the HOT Advisory Committee (and clarified below by Chairman Bursiel). Councilmember White seconded.

City Administrator Ferguson requested clarification on the effective date and applicability to advance registrations. Chairman Bursiel said that "we take a deposit to hold reservations, we collect money 30 days prior to their arrival date, so if this approved tonight, then we can discontinue the collection and re-adjust future reservations to reflect reduction in the tax - anything after January 31st." He clarified that no tax will be collected for any "stays" (as opposed to "reservations") after January 31st. As an example, he said if someone stays on January 31st through February 1st, tax would be collected for January 31st, but not for February 1st).

Motion carried on a vote of 4-1. Councilmember Dussler voted against.

- D. Discuss and consider possible action regarding a proposed Emergency Tourism Response Plan and the establishment of a \$5,000 reserve in the City's Hotel Occupancy Tax Fund to fund such a plan in the future, if needed. (*Hotel Occupancy Tax Advisory Committee Chairman Mark Bursiel*)

Chairman Bursiel advised that the HOT Committee considered this item at its October 6th meeting, reviewed certain portions of the Plan, and said print advertising was not found to be effective. He cited inconsistent messages sent after the flood about Wimberley being open for business. He referenced Pigeon Forge, Tennessee's budgeting of \$1,000 per \$1,000,000 in lost revenue after a wildfire, in order to bring back tourists. Using this as a benchmark, Mr. Bursiel stated that a \$5,000 fund could be used to help bring back visitors, if Wimberley lost \$5,000,000 in revenue. Mr. Bursiel noted that the Committee's recommendation is for an amount of \$5,000, but encouraged Council's matching of funds to help show the City is interested in bringing back business, just like other groups. Mr. Bursiel did not feel it fair to burden lodging people with footing the bill, when everyone is affected. He noted the Committee voted unanimously to recommend the Plan and \$5,000 reserve fund.

Mayor McCullough opened discussion.

Councilmember Trapp favored the proposed Plan and reserve fund, as recommended. Councilmember Dussler favored the proposal, as presented, but felt more funds might be needed.

Mayor McCullough entertained a motion.

Councilmember Fore moved to approve the Emergency Tourism Response Plan and the establishment of a \$5,000 reserve in the City's Hotel Occupancy Tax Fund to fund such a plan in

the future, if needed. Councilmember Trapp seconded. Discussion established that the fund will be kept in a separate account. Motion carried on a vote of 5-0.

- E. Discuss and consider possible action regarding a proposal to deobligate \$14,000 in Hotel Occupancy Tax funding previously allocated by City Council for the *2017 Paint Wimberley* event. (*City Administrator*)

Mayor McCullough entertained a motion.

Councilmember White moved to approve the deobligation of \$14,000 in Hotel Occupancy Tax funding previously allocated City Council for the *2017 Paint Wimberley* event. Councilmember Trapp seconded. Motion carried on a vote of 5-0.

- F. Discuss and consider possible action setting the date, time and place for a proposed City Council-Hotel Occupancy Tax Advisory Committee Workshop. (*Hotel Occupancy Tax Advisory Committee Chairman Mark Bursiel*)

Mayor McCullough stated the workshop is planned for Tuesday, January 31, 2017 at 5 p.m. at City Hall. Mr. Bursiel referenced the included draft of a proposed tourism vision to help facilitate the workshop discussion.

No vote was taken.

- G. Discuss and consider possible action on issues relating to financing for the Central Wimberley Wastewater Project. (*Place Three Councilmember Sally Trapp*)

Mayor McCullough asked Councilmember White to lead discussion of Agenda Items 5G-J.

Council agreed to Councilmember Trapp's request to continue Agenda Item 5G.

No vote was taken.

- H. Discuss and consider possible action setting the date, time and place for a Chapter 26 Public Hearing relating to the use of park land for the Central Wimberley Wastewater Project. (*City Administrator*)

City Administrator Ferguson recommended approval of Monday, February 13, 2017 at 6 p.m. at City Hall as the date/time/place for the subject meeting.

Mayor McCullough said he was recusing himself on these items (5G-J).

Councilmember Dussler stated he would be not be available on February 13th, but would be available on February 15, 2017.

Councilmember Trapp moved to approve Wednesday, February 15, 2017 at 6 p.m. at City Hall as the date, time, and place to hold a Chapter 26 Public Hearing relating to the use of park land

for the Central Wimberley Wastewater Project. Councilmember Barchfeld seconded. Mayor Pro-tem White called for a vote. Motion carried on a vote of 5-0.

- I. Discuss and consider possible action setting the date, time and place for a public meeting on wastewater rates relating to the Central Wimberley Wastewater Project. (*City Administrator*)

City Administrator Ferguson recommended scheduling this public meeting after City Council has held its workshop on Project options. Discussion favored continuing this item until Council has decided on an option to avoid having to possibly go back and develop another set of rates.

No vote was taken.

- J. Discuss and consider possible action setting the date, time and place for a City Council Workshop to discuss options for providing wastewater service to Central Wimberley and financing alternatives for such options. (*Place Three Councilmember Sally Trapp*)

Councilmember Trapp stated this meeting is to allow the Subcommittee to have a substantive discussion on options at the workshop.

City Administrator Ferguson recommended the week of January 23, 2017 and various dates were suggested.

Councilmember Trapp moved to schedule the City Council workshop to discuss options for providing wastewater service to Central Wimberley and financing alternatives for such options on Monday, January 23, 2017 at 6 p.m. at the Wimberley Community Center. Councilmember Barchfeld seconded. Mayor Pro-tem White called for a vote. Motion carried on a vote of 5-0.

- K. Discuss and consider possible action regarding a proposed increase in residential solid waste collection fees in the City of Wimberley. (*Texas Disposal Systems*)

Mayor McCullough resumed duties as presiding officer.

Texas Disposal Systems (TDS) representative Ray Bryant presented his company's request for a 32-cent per month increase in residential solid waste collection fees. Councilmember Fore noted that TDS has never reduced rates and truck volume through the Valley has not declined since TDS entered into its franchise agreement as sole trash service provider for the City. Discussion addressed possible solutions to the truck volume problem, which can be placed on a future agenda for consideration.

Councilmember White moved to approve the increase in residential solid waste collection fees in the City of Wimberley, as presented. Councilmember Barchfeld seconded. Motion carried on a vote of 4-1. Councilmember Fore voted against.

- L. Discuss and consider possible action relating to future use of the City of Wimberley General Fund Balance. (*City Administrator*)

Councilmember Fore said he has questions regarding previously pulled Consent Agenda Item 1D (Approval of November 2016 Financial Statements for the City of Wimberley). City Administrator Ferguson advised that questions can be forwarded to him ahead of the meeting and action to approve the November 2016 Financial Statements can be placed on a future agenda.

In response to a question asked at a previous meeting regarding the amount spent since the current Council took office, City Administrator Ferguson provided a breakdown of Fund Balance spending since June 2016 that reflects approximately \$80,000 in Fund Balance expenditures, with about \$50,000 of that amount spent in the current fiscal year. He noted that Fund Balance reporting will be modified to be read more like the City's Fund Balance Policy. He cited the City's Fund Balance of about \$1,325,000 and reviewed specific amounts earmarked for public works, grant matching, and wastewater project.

City Administrator Ferguson advised Council may want to consider establishing a minimum threshold amount for Fund Balance. He noted auditors in the past have recommended a Fund Balance sufficient to cover about four months of operating expenses, however, Council has historically maintained more than that amount. He spoke of variables such as FEMA flood money and potential unspent Planning and Development (PAD) money from the City's TWDB loan proceeds.

Councilmember Fore expressed concerns regarding depleting the Fund Balance to pay for wastewater project management (if not paid through TWDB loan proceeds) and the City's first two annual contributions for the Central Wimberley Wastewater System.

City Administrator Ferguson supported a strong Fund Balance and setting a minimum threshold as good planning practices. He stressed the City is not in dire straits financially, has a Fund Balance much larger than most similarly sized cities, and the noted the importance of prudent planning. He felt that information to the contrary needs to be corrected. Discussion addressed reasoning for maintaining a healthy Fund Balance, particularly for cities without an ad valorem tax, which have a less diversified revenue stream. City Administrator Ferguson noted Council could create a wastewater project reserve fund to address concerns regarding Fund Balance.

No vote was taken.

M. Discuss and consider possible action approving the proposed route for the 2017 Wimberley Fourth of July Parade. (*City Administrator*)

City Administrator Ferguson recommended approval of the route, which is the same as last year.

Councilmember Barchfeld moved to approve the route for the 2017 Wimberley Fourth of July Parade, as presented. Councilmember White seconded. Motion carried on a vote of 5-0.

6. City Council Reports

- Announcements
- Future Agenda Items

Mayor McCullough asked for Council input on a memorial for one of Wimberley's most loved and respected citizens, Bill Johnson, who passed away on January 1st.

Mayor McCullough stated he has purposely stayed out of sewer discussions and social media, as well as Aqua Texas meetings. He felt that the time is now to make decisions on issues related to wastewater, short-term rental CUPs, and the Hotel Occupancy Tax, and turn them into "positives." He said he can live with whatever Council decides, but urged action.

Hearing no further announcements or future agenda items, Mayor McCullough called the meeting adjourned.

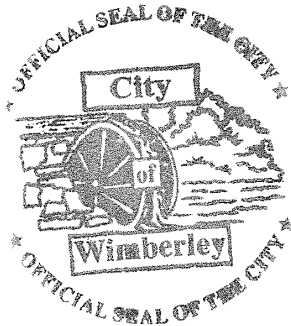
Adjournment: Council meeting adjourned at 9:26 p.m.

Recorded by:


Cara McPartland

These minutes approved on the 19th of January, 2017.

APPROVED:



Mac McCullough, Mayor

AGENDA:

**Hays City Council Meeting
February 13, 2017
6:30 P.M.**

LOCATION:

**City Hall
520 Country Ln.
Hays, TX. 78610**

REGULAR MEETING

1. CALL TO ORDER AND ROLL CALL
2. PLEDGE OF ALLEGIANCE
3. PUBLIC COMMENTS – Comments will be taken from the audience on non-agenda related topics. The City Council may take no action during Public Comments.
4. UNFINISHED BUSINESS
 - a. Receive update and take appropriate action regarding drainage project.
 - b. Receive financial report.
 - c. Receive update and take appropriate action on new initiatives of the city secretary.
5. NEW BUSINESS
 - a. Approve minutes for meeting on 1-9-2016.
 - b. Consider and take appropriate action to accept the financial audit report for FY2016.
 - c. Discuss, consider and take action regarding advertisement of construction bids to install drainage improvements within the City of Hays.
 - d. Take appropriate action to conduct surveys of residents about flooding issues during rain events as part of the hazard mitigation assistance grant.
 - e. Discuss and take appropriate action regarding election to be held on May 6, 2017.
 - f. Receive update from Bill Walters regarding the Hays Commons project.
 - g. Take appropriate action regarding request by McCarthy Construction Company to purchase bulk water from the City of Hays.

- h. Discuss and take appropriate action on request to form a committee to decorate city hall during Christmas Holidays.

6. ADJOURNMENT

Came to hand and posted this 10th of February, 2017 at 6:30 P.M.

Connie Gibbens - City Secretary

Hays County Hazard Mitigation Plan Update Status – January 31, 2017

- **July 2015** - Applied for Pre-Disaster Mitigation (PDM) grant to provide funding for update of Hazard Mitigation Plan which includes Hays County and 11 Community Partners;
- **June 2016** – Notice of PDM grant award and acceptance by Commissioners Court;
- **August 2016** – Solicitation for Consultant to prepare the Plan;
- **October 2016** – Partnership of Jeffrey S. Ward & Associates, Inc. and Halff Associates, Inc. selected to facilitate planning process and provide Plan update;
- **November 2016** – Enter into contract with above firms to complete the Plan;
- **December 2016** – First meeting of the planning team to kick off process;
- **January 2017** – Second meeting of the planning team for natural hazard risk assessment.

Hays County Hazard Mitigation Plan

Phase 1:

Kick-Off Meeting

12/08/2016

- Review planning area
- Confirm resources
- Updates to planning process
- Outreach strategy
- Review capabilities

Phase 2:

Risk Assessment Meeting

01/05/2017 (Tentative)

- Collect hazard history, impact data
- Validate hazards of concern
- Update community assets
- Revise problem statements
- Review Outreach activities for Phase 2

Phase 4:

Adopt and Implement Plan- Draft Plan Submittal to TDEM

03/15/2017

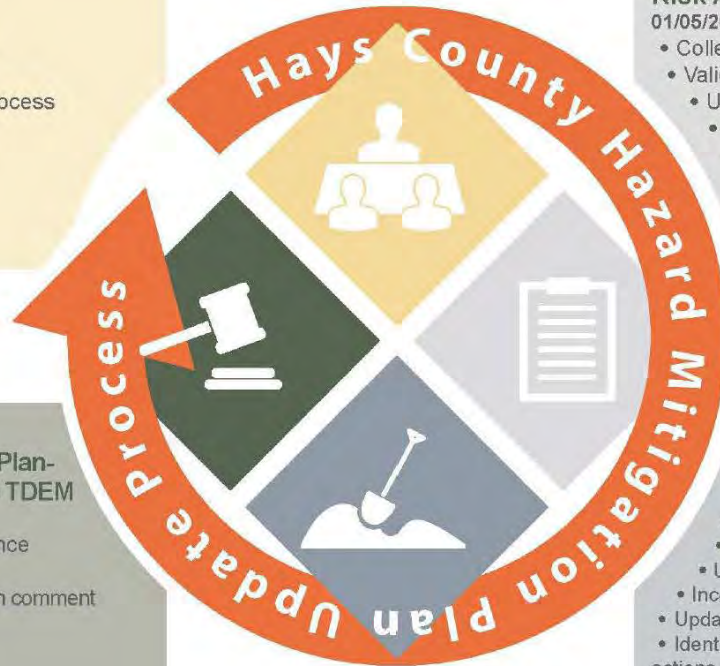
- Update Plan maintenance procedures
- Incorporate feedback from comment periods
- Assemble draft plan
- Submit to TDEM
- Preparation for Plan Adoption

Phase 3:

Mitigation Strategy Meeting

2/03/2017 (Tentative)

- Update goals
- Update actions
- Incorporate Strategy into other sources
- Update action priorities
- Identify possible funding sources for actions



Hazard Mitigation Plan Up... x

www.co.hays.tx.us/hazard-mitigation-plan-update.aspx

hays county

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HAYS COUNTY GOVERNMENT

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Plans, Policies and Reports
Business
Demographics
Health & Community
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Public Notices
Road Information
Transportation Projects
Cultural Arts Guidelines
Open Records
Hays County Holidays
Hazard Mitigation Plan Update

Home > Community > Hazard Mitigation Plan Update

Hazard Mitigation Plan Update

Hays County Hazard Mitigation Plan Update Status

Jan. 23, 2017

Hays County is currently coordinating the countywide update of the Hays County Hazard Mitigation Plan, which includes participation from all cities and villages in Hays County as well as the County itself. This planning effort is expected to continue until the plan draft is complete in the spring of 2017.

A Hazard Mitigation Plan outlines actions that can be taken to reduce or eliminate long-term risk to people and their property from natural hazards. It is an effective tool in identifying risks from and vulnerabilities to natural hazards, allowing communities to take action to protect its people and infrastructure before disasters occur. These plans are required as a condition for receiving federal mitigation grant funding for projects. The plan is updated every five years and the current effective plan will expire in November 2017. The current plan is available at the Hays County Web Site under "Plans, Policies and Reports - 2011" or at

<http://www.co.hays.tx.us/SharedFiles/Download.aspx?pageid=256&mid=290&fileid=614>

Part of the effort includes encouraging public feedback and involvement throughout the process. Citizens can provide their input regarding local community hazards by taking part in the Hays Hazard Mitigation Planning Public Opinion Survey. This questionnaire can be completed via the online survey tool at:

<https://www.surveymonkey.com/r/HaysHMPUpdatePublicSurvey>

Questionnaire responses will be collected through February 15, 2017.

For further information regarding the plan, please contact Kharley Smith, Hays County Emergency Services Director at Kharley.Smith@co.hays.tx.us or Jeff Hauff, Hays County Grants Administrator at Jeff.Hauff@co.hays.tx.us. Additional information will also be posted on this website as it becomes available.

[2011 Hazard Mitigation Plan](#)

**Agenda
City of Mountain City
City Hall
101 Mountain City Drive
City Council Monthly Meeting
Monday, 13 February, 2017 – 7:00 PM**

- 1. CALL REGULAR COUNCIL MEETING TO ORDER & ROLL CALL**
- 2. PUBLIC COMMENT & COMMUNICATION OF NON-AGENDA ITEMS:** (Persons wishing to speak on matters either on the agenda or not may be recognized at this time. Presentations are limited to three minutes, non-deferrable, Council may not respond to comments until the item in question is brought up on the agenda. Please note- more time, if needed, may be provided upon completion of the regular agenda.)
- 3. CONSENT ITEMS** (the items on the consent agenda are normally considered in a single motion. Any item may be removed from separate consideration upon request by any member of the Council)
 - a. **Approve minutes from January 9, 2017 monthly Council meeting**
 - b. **Approve Financial report from City Treasurer**
- 4. REPORTS**
 - a. **Mountain City Events update (P. Taylor)**
 - b. **Status report on purchase of Mountain City Oaks Water System (McClendon)**
 - c. **Update on Hays County Hazard Mitigation planning and Mountain city's role (P. Taylor)**
- 5. COMMITTEES AND BOARDS**

RECESS FOR BOARD OF ADJUSTMENT MEETING
- 6. UNFINISHED BUSINESS**
 - a. **Follow-up on possible ordinance violations (Craig)**
- 7. NEW BUSINESS**
 - a. **Identify, discuss and take possible action on new City Ordinance violations**
 - b. **Discuss and take possible action on approval of the 2017 Rebel Run 5K event (P. Taylor)**
 - c. **Discuss and take possible action on water system operator agreement (McClendon)**
 - d. **Swearing-in of Notary Public**
 - e. **Discuss and take possible action regarding selection of new city Administrator (P. Taylor)**
- 8. EXECUTIVE SESSION**

The City Council reserves the right to adjourn into Executive Session at any time during the course of this meeting to discuss any matters listed on the agenda, as authorized by the Texas Government Code, including, but not limited to, Sections 551.071 (Consultation with Attorney), 551.072 (Deliberations about Real Property), 551.073 (Deliberations about Gifts and Donations), 551.074 (Personnel Matters), 551.076 (Deliberations about Security Devices), 551.087 (Economic Development), 418.175-183 (Deliberations about Homeland Security Issues) and as authorized by the Texas Tax Code, including, but not limited to, Section 321.3022 (Sales Tax Information).

9. INFORMATIONAL ITEMS

- a. Website/Communication updates (P. Taylor)
- b. CAPCOG update (P. Taylor)
- c. Other information updates from Council members

10. ADJOURN

CERTIFICATION

I certify that a copy of the February 13, 2017 agenda of items to be considered by the City Council of Mountain City was posted on the two City public posting boards on February 10, 2017.

Ellis Craig, City Secretary

I certify that the attached notice and agenda of items to be considered by the City Council was removed by me from the City posting boards on the ____ day of _____, 2017.

City Council Meeting Agenda February 13, 2017

8807 Niederwald Strasse
Niederwald, Texas 78640



Tel. 512-398-6338
Fax: 512-376-9966

CITY OF NIEDERWALD

CITY COUNCIL AGENDA

Notice is hereby given of a meeting of the City Council of Niederwald to be held on Monday, January 23, 2017 at 7:00 p.m. at: City Hall & Council Chambers, 8807 Niederwald Strasse, Niederwald, Texas, for the purpose of considering the following agenda items. The City Council reserves the right to meet in closed session on any agenda item should the need arise and if applicable pursuant to authorization by Chapter 551, of the Texas Government Code.

Call to Order

Roll Call

Announce a Quorum is Present

A. MOMENT OF SILENCE

B. PLEDGES TO THE AMERICAN AND TEXAS FLAGS

C. PRESENTATIONS: Hays County Hazard Mitigation Plan update

D. **At this time 3-minute comments will be taken from the audience on non-Agenda related topics. To address the Council, please submit a Public Comment form to the City Secretary prior to the start of the meeting.**

Speakers will have one opportunity to speak during this time period and may speak on any matter not listed in the Agenda. Inquiries about matters not listed in the Agenda will either be directed to Staff or placed on a future agenda for Council consideration.

NO FORMAL ACTION CAN BE TAKEN ON THESE ITEMS AT THIS MEETING.

E. ACTION ITEMS

- **Citizens wanting to comment on Agenda items should submit a Public Comment form to the City Secretary prior to the meeting being called to order.**
- Individuals wishing to speak on an Agenda item will be allowed to speak when the Agenda item is called. Comments made during this time must be directly related to the agenda item under discussion and comments shall be limited to three (3) minutes per person.

7:10 p.m. Annexation Hearing – Annexation of approximately 14.75 acres located at 500 Schubert Lane named Haydn Place subdivision

F. EXECUTIVE SESSION: The Niederwald City Council will announce it will go into Executive Session, if necessary, pursuant to Chapter 551 of the Texas Government Code, Sections 551.071 Consultation with Attorney), 551.072 (Deliberations about Real Property), 551.073 (Deliberations about Gifts and Donations), 551.074 (Personnel Matters), 551.076 (Deliberations about Security Devices), 551.087 (Economic Development). The City Council may also announce it will go into Executive Session, if necessary, to receive advice from Legal Counsel regarding any other items on this agenda

G. RECONVENE into Regular Session and consider action, if any, on Items discussed in Executive session.

H. ANNOUNCEMENTS *No action or in-depth discussion may occur during this item.*

Reports from City officials or City staff regarding items of community interest, including expressions of thanks, congratulations or condolence; information regarding holiday schedules; honorary or salutary recognitions of public officials, public employees, or other citizens; reminders about upcoming events organized or sponsored by the City; information regarding social, ceremonial, or community events organized or sponsored by a non-City entity that is scheduled to be attended by City officials or employees; and announcements involving imminent threats to the public health and safety of people in the City that have arisen after the posting of the agenda

February 13, 2016 - Council Meeting and Zoning Hearing for Haydn Place

I. ADJOURNMENT

CERTIFICATION

I, the undersigned authority do hereby certify that this Notice of Meeting was posted on the door at the City Hall of the City of Niederwald, Texas, a place convenient and readily accessible to the general public at all times and said Notice was posted on the following date and time: Thursday, January 19, 2017 at 6:45 p.m. and remained so posted continuously for at least 72 hours preceding the scheduled time of said meeting.

Richard L. Crandal, Jr.
City Secretary/City Administrator

I certify that the attached notice and agenda of items to be considered by the City Council was removed by me from the City Hall bulletin board on the ____ day of _____, 2017 at _____ a.m./p.m.

_____ Title: _____

In compliance with the Americans with Disabilities Act, the City of Niederwald will provide for reasonable accommodations for persons attending City Council meetings. To better serve you, requests should be received 4 business days prior to the meetings. Please contact City Hall at (512) 398-6338 or FAX (512) 376-9966 for further information. Braille is not available.

Regular Meeting of the Board of Aldermen of the City of Umland, Texas, February 1, 2017 at 6:00 p.m. at Umland City Hall, 15 N. Old Spanish Trail, Umland, Texas, 78640.
This City of Umland provides unrestricted access for the disabled.
This Notice is posted pursuant to the Texas Open Meeting Act. (TEX REV. CIV. STAT. ANN, art 6252-17 (Vernon Sup. 1990)).

- a) ***Call to order, Mayor Bryan Geiger.***
- b) ***Roll call.***
- c) ***Pledges of Allegiance - United States and Texas***
- d) ***Discussion and action on January 11, 2017 minutes.***
- e) ***Public Comments (3 minutes per comment)***

1. Discussion and possible action on announcement of Mitigation Plan update and invitation for public to take public survey.
2. Presentation of Concept Plan on Grist Mill Road Project. (Jason Roberts)
3. Discussion and possible action on Building Code compliance and setting an authorizing agent for compliance issues and reporting.
4. Discuss and take any necessary action on a Resolution 02012017 approving an application for funding through the Texas Department of Agriculture's 2017-2018 Community Development Block Grant Program.
5. Discussion and possible action on an Interlocal Agreement between the City of Umland and County Line SUD for the Texas Department of Agriculture's 2017-2018 Community Development Block Grant.
6. Discussion and possible action on **Ordinance # 186, AN ORDINANCE OF THE CITY OF UHLAND, TEXAS MANDATING THE MUNICIPAL REGISTRATION OF CONTRACTORS AND PROVIDING REGISTRATIONS; COLLECTIONS OF FEES; ENFORCEMENT; PROVIDING A SAVINGS CLAUSE; PROVIDING FOR A SEVERABILITY CLAUSE; PROVIDING A PENALTY OF FINE NOT TO EXCEED THE SUM OF FIVE HUNDRED DOLLARS (\$500.00) FOR EACH OFFENSE; PROVIDING FOR PUBLICATION; AND PROVIDING AN EFFECTIVE DATE.**
7. Discussion and possible action **Ordinance # 187 an ordinance of the City of Umland Texas zoning for traffic and rate of speed therein, on SH 21 in the City Limits of the City of Umland defining Speeding and fixing a penalty therefore; Declaring what may be a sufficient compliant in prosecutions hereunder; with a saving clause repelling conflicting laws and declaring an emergency.**
8. Discussion and possible action on amending Ordinance # 168 Fee Schedule section 7.7. Contractor fees.

City Administrator report.

Meeting adjourn.

The Board of Aldermen reserves the right to adjourn into executive session at any time during the course of this meeting to discuss any of the items listed above, as authorized by Texas Government Code Section 551.071 (Consultation with Attorney), 551.072 (Deliberations about Real Property), 551.073 (Deliberations about Gifts and Donations), 551.074 (Personnel Matters), 551.076 Deliberations about Security Devices), and 551.087 (Economic Development). In compliance with the Americans with Disabilities Act, the City of Umland will provide for reasonable accommodations for persons attending City Council meetings. To better serve you, requests should be received 48 hours prior to the meetings. Please Contact Karen Gallaher, City Administrator, at 512-398-7399

Please contact City Hall at (512) 398-7399 for further information. Braille is not available. Our email address is city@uhlandtx.us.

I certify that this notice was posted on the bulletin board outside the Umland City hall the on the _____ day of _____, 2017 at _____ a.m. / p.m.

Karen Gallaher, City Administrator _____

I certify that this notice was removed from the bulletin board outside the Umland City Hall on the _____ day of _____, 2017 at _____ a.m. / p.m. Karen Gallaher, City Administrator.

HAYS COUNTY

HAZARD MITIGATION PLAN UPDATE

NEWSLETTER

Issue 1 of 4

Hazard Mitigation Planning

Hazard Mitigation Planning empowers local governments to improve the quality of life for the members of their communities through implementing actions to reduce or eliminate long-term risk to people and their property from hazards. It is an effective tool in identifying risks and vulnerabilities to natural hazards allowing comprehensive and sustainable plans to protect communities before a disaster occurs. A Hazard Mitigation Plan is required as a condition for receiving mitigation grants under the Pre-Disaster Mitigation (PDM) program, post-disaster Hazard Mitigation Grant Program (HMGP), and Flood Mitigation Assistance Program (FMA) program.

Hays County Hazard Mitigation Update

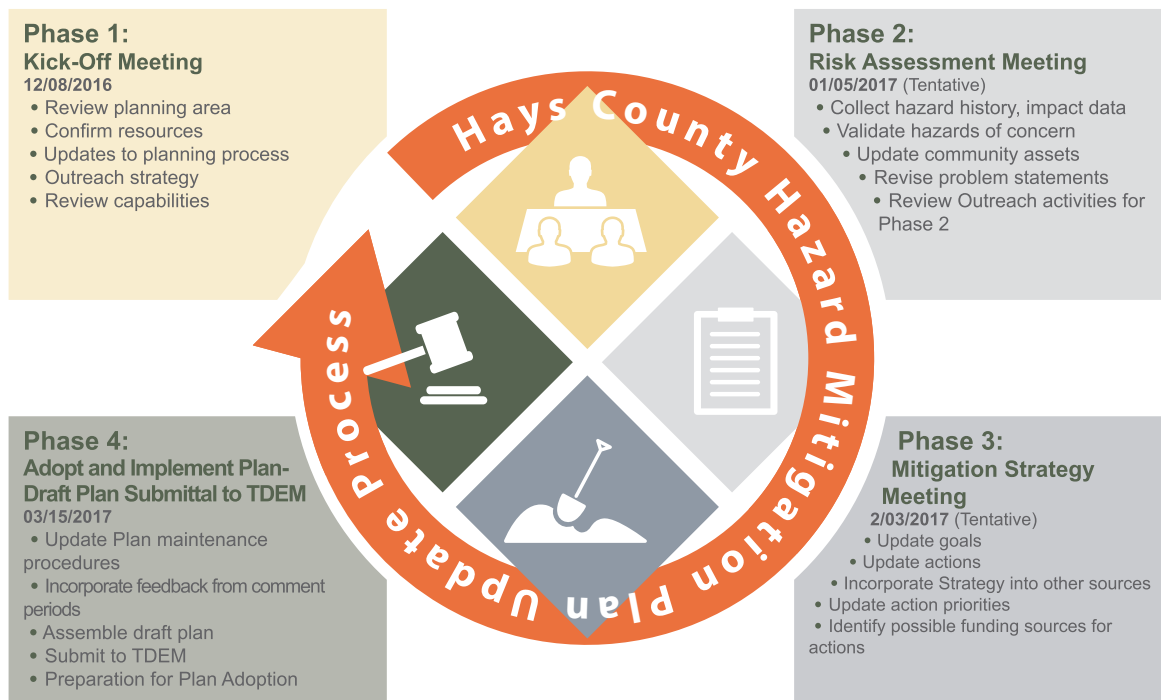
Hays County, along with the participating communities of the Village of Bear Creek, Buda, Dripping Springs, Hays, Kyle, Mountain City, Niederwald, San Marcos, Uhland, Wimberley, and Woodcreek were all included in the FEMA approved Hays County, Texas, 2011 Hazard Mitigation Plan Update. The Plan must be updated every five years and will expire November 28, 2017. Hays County has assembled a Mitigation Planning Team to develop the revised mitigation Plan for the update and to address any new FEMA requirements to be included in the Plan.

Why Plan?

- Increase of public awareness and understanding of risk and vulnerability.
- Reduction of risk to the community.
- Use Digital Flood Insurance Rate Maps (DFIRM's) or best available flood risk information to identify and mitigate future risk to flood hazards.
- Building of partnerships between stakeholders allowing for shared resources and knowledge.
- Growth in understanding of potential risk reduction measures and tools potentially mitigating future losses.
- Community Rating System (CRS) activity allowing potential reduction in NFIP premiums.
- Federal Hazard Mitigation funding eligibility.



Hazard Mitigation Planning Process



HMP Update Kick-Off Meeting, December 8, 2016 – 1:00 p.m.

The first of three planning meetings is scheduled for Thursday, December 8, 2016 from 1:00pm – 3:00pm at Kyle Fire Station #1, 210 W. Moore St., Kyle, Texas 78640 to discuss the components of the Hazard Mitigation Plan Update. The Hazard Mitigation Planning Team along with consultants contracted to assist in the Plan update effort, Jeffrey S. Ward and Associates in partnership with Half Associates, Inc., will organize and attend the meetings. Active participation and involvement from participating communities is necessary to be included in the Hazard Mitigation Plan Update and is documented using sign-in sheets to ensure FEMA participation standard compliance. All individual participating communities must be represented at each of the three planning meetings. Prior to and as part of the Kick-Off Meeting, the Hazard Mitigation Planning Team will be collecting data from the participating community representatives that is essential to the update process. The information collection process will utilize paper surveys and questionnaires, open discussion, email surveys, and spreadsheet data requests.

Who should attend?

Participating members include but are not limited to: City Council/Board of Commissioner, Planning Commission, Planning/Community Development, Regional Metropolitan Planning, Special Districts, Building Code Enforcement, Emergency Management, Fire Department/Districts, Floodplain Administration, Geographic Information Systems (GIS), Parks and Recreation, Public Information Office, Public Works, Stormwater Management, Transportation (Roads/Bridges), and State Emergency Management Office.

Contacts and Information:

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JSWA, Inc.
Phone: 540.668.6945
Email: jward@rstarmail.com

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Half Associates, Inc.
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Trish Burros
Half Associates, Inc.
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HAYS COUNTY

HAZARD MITIGATION PLAN UPDATE NEWSLETTER

Issue 2 of 4

Hays County Hazard Mitigation Update Status

The Hays County Hazard Mitigation Plan Update process continues with progress with the Kick-Off (Plan Process) phase complete, the Risk Assessment underway and the Mitigation Strategy phase beginning in early February. All efforts are on target for draft plan completion by mid-March.



Halff Risk Ranking Tool

Using a Halff-exclusive risk assessment tool, each community's hazards will be ranked according to risk based on their quantified impacts on

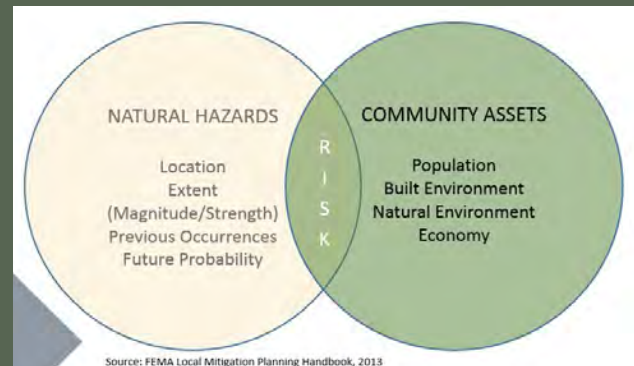
- Health and Safety
- Property Damage
- Business Continuity/Resiliency
- Citizen Perception/Concern

What is a Risk Assessment?

According to the FEMA Local Mitigation Planning Handbook, "The risk assessment provides the foundation for the rest of the mitigation planning process, which is focused on identifying and prioritizing actions to reduce risks to hazards." The risk assessment phase involves an examination of the hazards that Hays County and participating communities face, their probability, their past or potential impact and the vulnerabilities that could increase the extent of any given event.

Hays County will rank the following hazards:

Drought	Dam/Levee Failure
Extreme heat	Wildfire
Severe Winter Storm	Flood
Lightning	Land Subsidence
Hailstorms	Hurricanes/Tropical Storms
Windstorms	Earthquakes
Tornado	Expansive Soils



Source: FEMA Local Mitigation Planning Handbook, 2013

HMP Update Kick-Off Meeting



HMP Update Risk Assessment Meeting, January 12, 2017 – 1:00 p.m.

The second of three planning meetings was held on Thursday, December 8, 2016 from 1:00pm – 4:00pm at Wimberley Community Center, 14068 Ranch Road 12, Wimberley, Texas 78676 to work through the Risk Assessment components of the Hazard Mitigation Plan Update. The meeting was attended by the Hazard Mitigation Planning Team, stakeholders from various community entities and the JWSA/Halff consulting team. Active participation and involvement from participating communities is necessary to be included in the Hazard Mitigation Plan Update and is documented using sign-in sheets to ensure FEMA participation standard compliance. All individual participating communities have been represented at the first two of the three planning meetings.

Save the Date: HMP Update Mitigation Strategy Meeting

The third and final planning meeting will be held on Monday, February 13, 2017 at the Hays County Government Center- Public Meeting Room at 712 S. Stagecoach Trail, San Marcos, Texas 78666. Planners and the stakeholders that they have identified for inclusion will be invited to attend. Public input is encouraged through the Hays County Hazard Mitigation Plan Update Public Survey, found at <https://www.surveymonkey.com/r/HaysHMPUpdatePublicSurvey>. Public comment will also be accepted on the draft of the plan prior to submission for review/approval from State and Federal government.

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Email: cengelhardt@halff.com

Trish Burros
Halff Associates, Inc.
Phone: 512.777.4567
Email: pburros@halff.com

HAYS COUNTY

HAZARD MITIGATION PLAN UPDATE NEWSLETTER

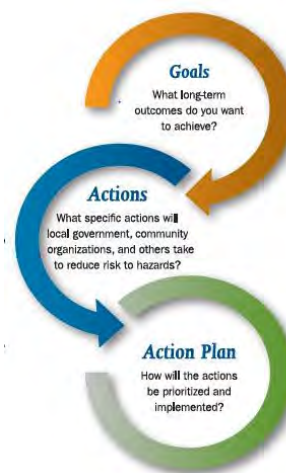
Issue 3 of 4

Hays County Hazard Mitigation Update Status

The Hays County Hazard Mitigation Plan Update process continues with progress with the Risk Assessment phase complete, the Mitigation Strategy underway and the Adoption and Implementation phase beginning in early April. All efforts are on target for draft plan completion by mid-March.



The Mitigation Strategy Phase



According to the FEMA Local Mitigation Planning Handbook, “The heart of the mitigation plan is the mitigation strategy, which serves as the long-term blueprint for reducing the potential losses identified in the risk assessment.” The Mitigation Strategy phase involves determining how the communities will meet the goals of their planning effort by identifying the actions by which to achieve them and establishing a plan for implementing them.

Hays County Public Survey Results

Results shown as of February 1, 2017

Community	Number of Results
Buda	212
Bear Creek	18
Dripping Springs	24
Hays	19
Kyle	23
Mountain City	24

Community	Number of Results
Niederwald	0
San Marcos	140
Umland	7
Wimberley	10
Woodcreek	63
Hays County	96

HMP Update Risk Assessment Meeting

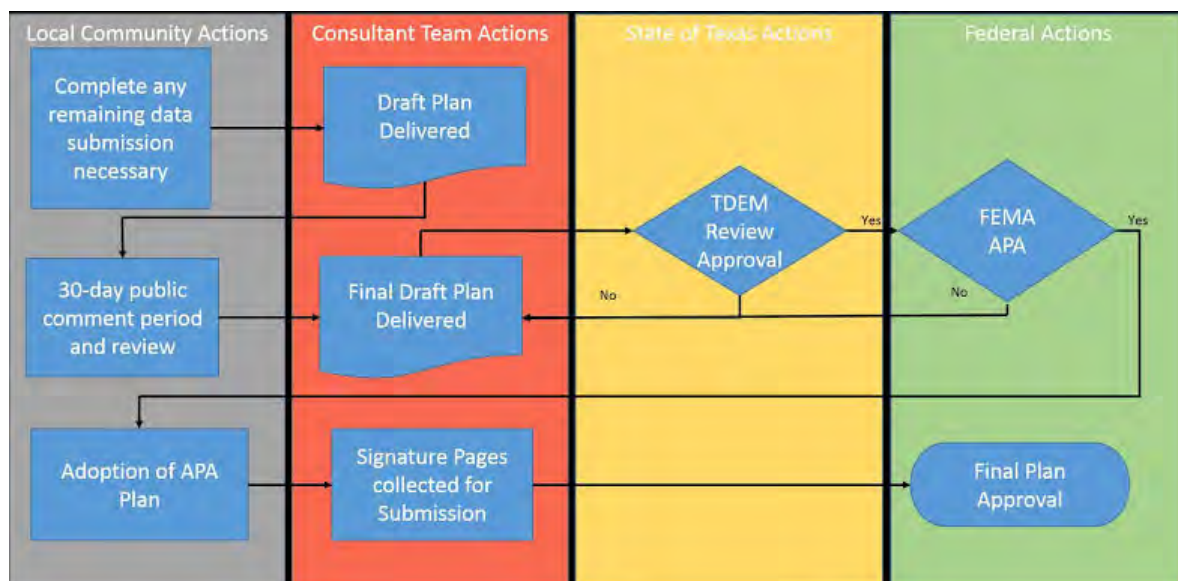


HMP Update Mitigation Strategy Meeting

The third and final planning meeting will be held on Monday, February 13, 2017 at the Hays County Government Center-Public Meeting Room at 712 S. Stagecoach Trail, San Marcos, Texas 78666. Planners and the stakeholders that they have identified for inclusion will be invited to attend. Public input is en-

couraged through the Hays County Hazard Mitigation Plan Update Public Survey, found at <https://www.surveymonkey.com/r/HaysHMPUpdatePublicSurvey>. Public comment will also be accepted on the draft of the plan prior to submission for review/approval from State and Federal government.

HMP Update Adoption and Implementation Phase



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▶ Transportation Projects

▶ Cultural Arts Guidelines

▶ Open Records

▶ Hays County Holidays

▶ Hazard Mitigation Plan Update

Home > Community > **Hazard Mitigation Plan Update**

Hazard Mitigation Plan Update

Hays County Hazard Mitigation Plan Update Status

Jan. 23, 2017

Hays County is currently coordinating the countywide update of the Hays County Hazard Mitigation Plan, which includes participation from all cities and villages in Hays County as well as the County itself. This planning effort is expected to continue until the plan draft is complete in the spring of 2017.

A Hazard Mitigation Plan outlines actions that can be taken to reduce or eliminate long-term risk to people and their property from natural hazards. It is an effective tool in identifying risks from and vulnerabilities to natural hazards, allowing communities to take action to protect its people and infrastructure before disasters occur. These plans are required as a condition for receiving federal mitigation grant funding for projects. The plan is updated every five years and the current effective plan will expire in November 2017. The current plan is available at the Hays County Web Site under "Plans, Policies and Reports – 2011" or at

<http://www.co.hays.tx.us/SharedFiles/Download.aspx?pageid=256&mid=290&fileid=614>

Part of the effort includes encouraging public feedback and involvement throughout the process. Citizens can provide their input regarding local community hazards by taking part in the Hays Hazard Mitigation Planning Public Opinion Survey. This questionnaire can be completed via the online survey tool at:

<https://www.surveymonkey.com/r/HaysHMPUpdatePublicSurvey>.

Questionnaire responses will be collected through February 15, 2017.

For further information regarding the plan, please contact Kharley Smith, Hays County Emergency Services Director at Kharley.Smith@co.hays.tx.us or Jeff Hauff, Hays County Grants Administrator at Jeff.Hauff@co.hays.tx.us. Additional information will also be posted on this website as it becomes available.

[2011 Hazard Mitigation Plan](#)
[Hazard Mitigation Plan Update to Court 31Jan2017](#)

Public Comment

Presented below are the draft Hazard Mitigation Plan documents for review and comment. Public comments on the proposed draft documents will be accepted from July 12 through July 26, 2017. Please submit any comments to HMPComments@co.hays.tx.us or through regular mail to: Grants Administration Department, Hays County Government Center, 712 S. Stagecoach Trail, Suite 1204, San Marcos, Texas, 78666". Written comments are preferred, and questions may also be directed to the above addresses.

Documents





























<http://www.co.hays.tx.us/hazard-mitigation-plan-update.aspx>[7/19/2017 8:39:11 AM]

Appendix A

A.47

Hays County Hazard Mitigation Plan

Hazard Mitigation Plan Update - Hays County

File Name		Modified
  City of Buda_Annex_7.5.17_Webdraft.pdf		7/6/2017 3:57:57 PM
  City of Dripping Springs_Annex_7.5.17_Webdraft.pdf		7/6/2017 3:57:57 PM
  City of Hays_Annex_7.5.17_Webdraft.pdf		7/6/2017 3:58:03 PM
  City of Kyle_Annex_7.5.17_Webdraft.pdf		7/12/2017 8:28:18 AM
  City of Mountain City_Annex_7.5.17_Webdraft.pdf		7/6/2017 3:58:10 PM
  City of Niederwald_Annex_7.5.17_Webdraft.pdf		7/6/2017 3:58:10 PM
  City of San Marcos_Annex_7.5.17_Webdraft.pdf		7/6/2017 3:58:10 PM
  City of Uhland_Annex_7.5.17_Webdraft.pdf		7/6/2017 3:58:20 PM
  City of Wimberley_Annex_7.5.17_Webdraft.pdf		7/6/2017 3:58:20 PM
  City of Woodcreek_Annex_7.5.17_Webdraft.pdf		7/6/2017 3:58:20 PM
  Hays County Hazard Mitigation Plan_7.5.17_Webdraft.pdf		7/6/2017 3:58:26 PM
  Hays County_Annex_7.5.17_Webdraft.pdf		7/6/2017 3:58:26 PM
  HMP Executive Summary July 2017.pdf		7/12/2017 8:17:48 AM
  Village of Bear Creek_Annex_7.5.17_Webdraft.pdf		7/6/2017 3:58:26 PM



[Site Map](#) | [Printable View](#) | © 2013 - 2017 Hays County



Hays County Hazard Mitigation Plan Update Process

Hays County Community Council Talking Points

The community of _____ is currently participating in the plan update process for the Hays County Hazard Mitigation Plan. Plan participants include representatives from all cities/towns within Hays County, as well as Hays County officials. _____, who serves as _____, is the lead planning contact for our community and is going to be involved in the process until the plan draft is complete in the Spring of 2017.

A Hazard Mitigation Plan is a document that outlines actions that can be taken to reduce or eliminate long-term risk to people and their property from hazards. It is an effective tool in identifying risks and vulnerabilities to natural hazards, allowing communities to take action to protect its people and infrastructure before disasters occur. These plans are required as a condition for receiving federal mitigation grant funding for projects. The plan is updated every 5 years and the current effective plan expires on November 28, 2017.

Part of the effort includes encouraging public feedback and involvement throughout the process. Citizens can provide their input regarding local community hazards by taking part in the Hays Hazard Mitigation Planning Public Opinion Survey. This questionnaire can be completed via the online survey tool called Survey Monkey or on paper forms. The Survey Monkey link for the questionnaire can be found on the _____ website. Paper copies of the questionnaire will be located at _____ and can be turned in at _____. Questionnaire responses will be collected through February 15, 2017.

APPENDIX

B

Planning Committee Documents

Hays County Hazard Mitigation Plan

MPC Planning Meeting Action Items

Community Responsibilities

Hazard photographs:

- Please submit any hazard related photographs affecting your community to JSWA/Halff

Phone interviews/surveys with each jurisdiction:

<https://www.surveymonkey.com/r/HaysCountyHazMit>

Jurisdiction Information Packet:

- Planner Action Items
- Phase 1 Kick-Off Slides
- 2011 Plan Documents
- Data Collection Worksheets
 - Planning Team Update
 - NFIP Status Update
 - Hazard Update
 - Vulnerability/Asset Update
 - Mitigation Action Update

Phase 2 Plan Update Actions

Review and return approved Risk Ranking by email by 01/20/2017

ASAP Complete Planner Survey Monkey, if not already done

<https://www.surveymonkey.com/r/HaysCountyHazMit>

ASAP Turn in:

Mitigation Action Progress Reports

Safe Growth Audit

NFIP Status Report

Request for Information Spreadsheet

ASAP Post Public Survey and encourage participation

<https://www.surveymonkey.com/r/HaysHMPUpdatePublicSurvey>

Phase 3 Plan Update Actions

ASAP Complete Planner Survey Monkey, if not already done

<https://www.surveymonkey.com/r/HaysCountyHazMit>

ASAP Turn in:

Mitigation Action Progress Reports

Documentation of Council/Court Agenda Item

ASAP Collect and Send:

Photos, logos for plan development

Kick-Off Meeting Agenda

Hazard Mitigation: A Quick Overview
 Mitigation Planning: Purpose, Goals and Objectives
 Hays County Hazard Mitigation Plan Status
 Plan Update Process & Timeline Review
 Current Plan Contents Outline
 Plan Update Actions (Tasks)
 Path Forward

Risk Assessment Meeting Agenda

Recap of Kick-Off Meeting

- Actions/Decisions
- Data Collection Status

What is a Risk Assessment?

The Halff Risk Ranking Tool

Break

Hazard Profile Review/Risk Ranking Exercise

Break

Risk Ranking Sheet Review

Phase 2 Plan Update Actions (Tasks)

Mitigation Strategy Meeting Date-Setting

Mitigation Strategy Meeting Agenda

PHASE 2 WRAP-UP

Recap of Risk Assessment Meeting

- Data Collection Status
- The Halff Risk Ranking Tool Results
- Survey Results

PHASE 3

What is the Mitigation Strategy?

Goal Review

Incorporation Review

Previous Action Review

New Action Development

Mitigation Action Ranking

PHASE 4

Plan Maintenance

Continued Public Outreach

Phase 3 Plan Update Actions

The Next Steps

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APPENDIX

C

Data Collection Tools



Hays County Hazard Mitigation Plan Update Process

Phase 1 Request

Planner Action Items

- ☐ Read Newsletter
- ☐ Complete Information Request Spreadsheet Workbook
- ☐ Access and complete Hays County Hazard Mitigation Plan Update Planner's Online Survey <https://www.surveymonkey.com/r/HaysCountyHazMit>
- ☐ Distribute and share Hays County Hazard Mitigation Plan Update Public Online Survey
- ☐ Complete Hazard History Worksheet (in packet)
- ☐ Review Hays County Hazard Listing (in packet)
- ☐ Review currently listed HAZUS critical facilities exhibit (in packet) update in spreadsheet workbook
- ☐ Complete Safe Growth Audit Survey (in packet)
- ☐ Complete National Flood Insurance Program Worksheet (in packet)
- ☐ Complete Mitigation Action Progress Reports (in packet)
- ☐ Complete Planner/Stakeholder Worksheet (in packet)
- ☐ Begin Public Outreach Activities
 - ☐ Press Releases
 - ☐ Community Website Updates (Link to SurveyMonkey Public Survey)
 - ☐ Public Events for Survey Collection (if applicable)



Hays County Hazard Mitigation Plan Update Process

Phase 1 Request

Planners/Stakeholder Worksheets

Please provide information regarding community planners and stakeholders that should be invited to planning meetings and kept informed of the plan update process.

Name /Phone/ Email for person completing survey: _____

Local Agencies

Check off applicable agencies and provide POC (name at minimum)

Local Agency	POC Name	Is this person also on the planning team?
Building Code Enforcement		
City Management/County Administration		
Emergency Management		
Fire Department/District		
Floodplain Administration		
Geographic Information Systems (GIS)		
Parks and Recreation		
Planning/Community Development		
Public Works		
Stormwater Management		
Transportation (Roads/Bridges)		
City Council/Board of Commissioners		
Planning Commission		
Regional/Metropolitan Planning Organizations		
City/County Attorney's Office		
Economic Development Agency		
Local Emergency Planning Committee		
Police/Sheriff's Department		
Sanitation Department		
Tax Assessor's Office		
Other:		
Other:		
Other:		



Hays County Hazard Mitigation Plan Update Process

Phase 1 Request

Special Districts and Authorities

Organization	POC Name	Is this person also on the planning team?
Airport, Seaport Authorities		
Fire Control District		
Flood Control District		
School Districts		
Transit Authority		
Utility Districts		
Other:		
Other:		
Other:		

Special Districts and Authorities

Organization	POC Name	Is this person also on the planning team?
Organization		
American Red Cross		
Chamber of Commerce		
Environmental Organizations		
Homeowners Associations		
Neighborhood/Community Organizations		
Utility Companies		
Environmental Organizations		
Homeowners Associations		
Neighborhood/Community Organizations		
Utility Companies		
Community/Faith Based Organizations		



Hays County Hazard Mitigation Plan Update Process

Phase 1 Request

Other

Organization	POC Name	Is this person also on the planning team?
Tribal Officials		
Colleges/Universities		
Land Developers and Real Estate Agencies		
Major Employers and Businesses		
Professional Associations		
Neighboring Jurisdictions		



Hays County Hazard Mitigation Plan Update Process

Phase 1 Request

National Flood Insurance Program Worksheet

NFIP Topic	Comments
Insurance Summary	
How many structures are exposed to flood risk within the community?	
Describe any areas of flood risk with limited NFIP policy coverage.	
Staff Resources	
Is the Community FPA or NFIP Coordinator certified?	
Is floodplain management an auxiliary function?	
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	
What are the barriers to running an effective NFIP program in the community, if any?	
Regulation	
Do floodplain development regulations meet or exceed FEMA or State minimums requirements? If so, in what ways?	
Provide an explanation of the permitting process.	
Community Rating System (CRS)	
Does the community participate in CRS?	
Does the plan include CRS planning requirements?	



Hays County Hazard Mitigation Plan Update Process

Phase 1 Request

County Hazard Listing

Hays County Hazards

Current Hazards Listed (2011 Plan)	Tentative Updated Hazard Listing (2017 Plan Update)
Floods (Riverine and Shallow)	Floods
Tornadoes	Tornado
Severe Thunderstorms/High Winds	Windstorms
Dam Failure	Dam/Levee Failure
Winter Storm, Extreme Cold, Ice Storm	Severe Winter Storms
Wildfire/Brush Fire	Wildfire
Tropical Storms and Tropical Cyclones	Hurricanes/Tropical Storms
Drought	Drought
Seismic/Earthquake	Earthquakes
Hail Storm	Hailstorm
Extreme Heat	Extreme Heat
	Lightning

Hazards not included:

Coastal Erosion
Expansive Soils
Land Subsidence

Jurisdictional Hazard Listing

Current Hazards Listed (2011 Plan)	Tentative Updated Hazard Listing (2017 Plan Update)
Floods	Floods
Tornadoes	Tornadoes
Winter Storm	Severe Winter Storms

Hays County Hazard Mitigation Plan Update Process

Phase 1 Request

Hazard History

In order to ensure that hazard prioritization takes recent history into account, this worksheet page captures federal and non-federally recognized disaster events.

Date of Initial Declaration	Disaster Number	Disaster Type	Assistance Received
1/17/2014	4159-DR	Severe Storms and Flooding	Public Assistance
5/29/2015	4223-DR	Severe Storms, Tornadoes, Straight-Line Winds and Flooding	Individual and Public Assistance
1/29/2016	4245-DR	Severe Storms, Tornadoes, Straight-Line Winds and Flooding	Individual and Public Assistance

Please List Non-Federal Natural Disaster Events from 2001 to Present Day.

1.) Date	Hazard Type	Event Description/Location
Severity/Extent (using scales if applicable)		Human/Financial Impact
2.) Date	Hazard Type	Event Description/Location
Severity/Extent (using scales if applicable)		Human/Financial Impact
3.) Date	Hazard Type	Event Description/Location
Severity/Extent (using scales if applicable)		Human/Financial Impact



Hays County Hazard Mitigation Plan Update Process

Phase 1 Request

Hazard History Continued

4.) Date	Hazard Type	Event Description/Location
Severity/Extent (using scales if applicable)		Human/Financial Impact
5.) Date	Hazard Type	Event Description/Location
Severity/Extent (using scales if applicable)		Human/Financial Impact
6.) Date	Hazard Type	Event Description/Location
Severity/Extent (using scales if applicable)		Human/Financial Impact



Hays County Hazard Mitigation Plan Update Process

Phase 1 Request

Safe Growth Audit

In order to ensure that hazard prioritization takes recent history into account, this worksheet page captures federal and non-federally recognized disaster events.

Planning and Regulation	Yes	No	If no, is it a possible future action? (yes or no)
Land Use			
1. Does the future land-use map clearly identify natural hazard areas?			
2. Do the land-use policies discourage development or redevelopment within natural hazard areas?			
3. Does the plan provide adequate space for expected future growth in areas located outside natural hazard areas?			
Transportation			
1. Does the transportation plan limit access to hazard areas?			
2. Is transportation policy used to guide growth to safe location?			
3. Are movement systems designed to function under disaster conditions (e.g. evacuation)?			



Hays County Hazard Mitigation Plan Update Process

Phase 1 Request

Environmental Management

1. Are environmental systems that protect development from hazards identified and mapped

2. Do environmental policies maintain and restore protective ecosystems?

3. Do environmental policies provide incentives to development that is located outside protective ecosystems?

Public Safety

1. Are the goals and policies of the comprehensive plan related to those of the FEMA Local Hazard Mitigation Plan?

2. Is safety explicitly included in the plan's growth and development policies?

3. Does the monitoring and implementation section of the plan cover safe growth objectives?



Hays County Hazard Mitigation Plan Update Process

Phase 1 Request



Zoning Ordinance

1. Does the zoning ordinance conform to the comprehensive plan in terms of discouraging development or redevelopment within natural hazard areas?			
2. Does the ordinance contain natural hazard overlay zones that set conditions for land use within such zones?			
3. Do rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use?			
4. Does the ordinance prohibit development within, or filling of wetlands, floodways, and floodplains?			

Subdivision Regulations

1. Do the subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas?			
2. Do the regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources?			
3. Do the regulations allow density transfers where hazard areas exist?			



Hays County Hazard Mitigation Plan Update Process

Phase 1 Request

Capital Improvement Program and Infrastructure Policies

1. Does the capital improvement program limit expenditures on projects that would encourage development in areas vulnerable to natural hazards?

2. Do infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards?

3. Does the capital improvement program provide funding for hazard mitigation projects identified in the FEMA Mitigation Plan?

Other

1. Do small area or corridor plans recognize the need to avoid or mitigate natural hazards?

2. Does the building code contain provisions to strengthen or elevate construction to withstand hazard forces?

3. Do economic development or redevelopment strategies include provisions for mitigation natural hazards?

4. Is there an adopted evacuation and shelter plan to deal with emergencies from natural hazards?

Phase 3 Request



Hays County Hazard Mitigation Plan Update Process

Benefit and Cost Review

Community Name: _____

Person completing questionnaire: _____

A Benefit-Cost review is a way to provide a broad estimate of the quantitative and qualitative costs and benefits associated with each action that is being considered for inclusion in the Hazard Mitigation Plan update. This review is far less specific and detailed than the Benefit-Cost analysis, which is required for technical cost-effectiveness. The following tool can be used for estimating costs and benefits for the Mitigation Action Summary.

Measuring Benefit of Actions- by the numbers

Use this table if the benefits for your project are quantifiable

Category	Factor	Before Mitigation Action	After Mitigation Action	Difference (Use these sentences to fill in the Benefits portion of the Mitigation Action Summary)
Safety/Way of Life	Number of People Affected by the Hazard			
	Amount of Infrastructure/ Critical Facilities Affected			
Economic	Number of Acres/ Miles Affected			
	Value of Property Affected			
	Number of Businesses Affected			

Mitigation Prioritization Worksheet

Community Name: _____

Person completing questionnaire: _____

[illegible]

Mitigation Prioritization Worksheet

Community Name: _____

Person completing questionnaire: _____

[illegible]

Mitigation Prioritization Worksheet

Community Name: _____

Person completing questionnaire: _____

Mitigation Action	Action Type (Choose one) - Plans/Regulations - Structure/Infrastructure Projects - Natural Systems Protection - Educational and Awareness Programs	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Risk Ranking Score	Total Score

Worksheet Instructions

Rank each of the criteria (with the exception of the Risk Ranking Score) with a -1, 0 or +1 using the following scale:

+1	Highly effective or feasible
0	Neutral
-1	Ineffective or not feasible

Explanation of Categories:

Life Safety: How effective will the action be at protecting lives and preventing injuries?

Technical: Is the mitigation action technically feasible? Is it a long-term solution? Eliminate actions, that from a technical standpoint, will not meet the goals.

Political: Is there overall public support for the mitigation action? Is there the political will to support it?

Legal: Does the community have the authority to implement the action?

Environmental: What are the potential environmental impacts of the action? Will it comply with environmental regulations?

Social: Will the proposed action adversely affect one segment of the population? Will the action disrupt established neighborhoods, break up voting districts or cause the relocation of lower income people?

Administrative: Does the community have the personnel and administrative capabilities to implement the action and maintain it or will outside help be necessary?

Local Champion: Is there a strong advocate for the action or project among local departments and agencies that will support the action's implementation?

Other Community Objectives: Does the action advance other community objectives, such as capital improvements, economic development, environmental quality, or open space preservation? Does it support the policies of the comprehensive plan?

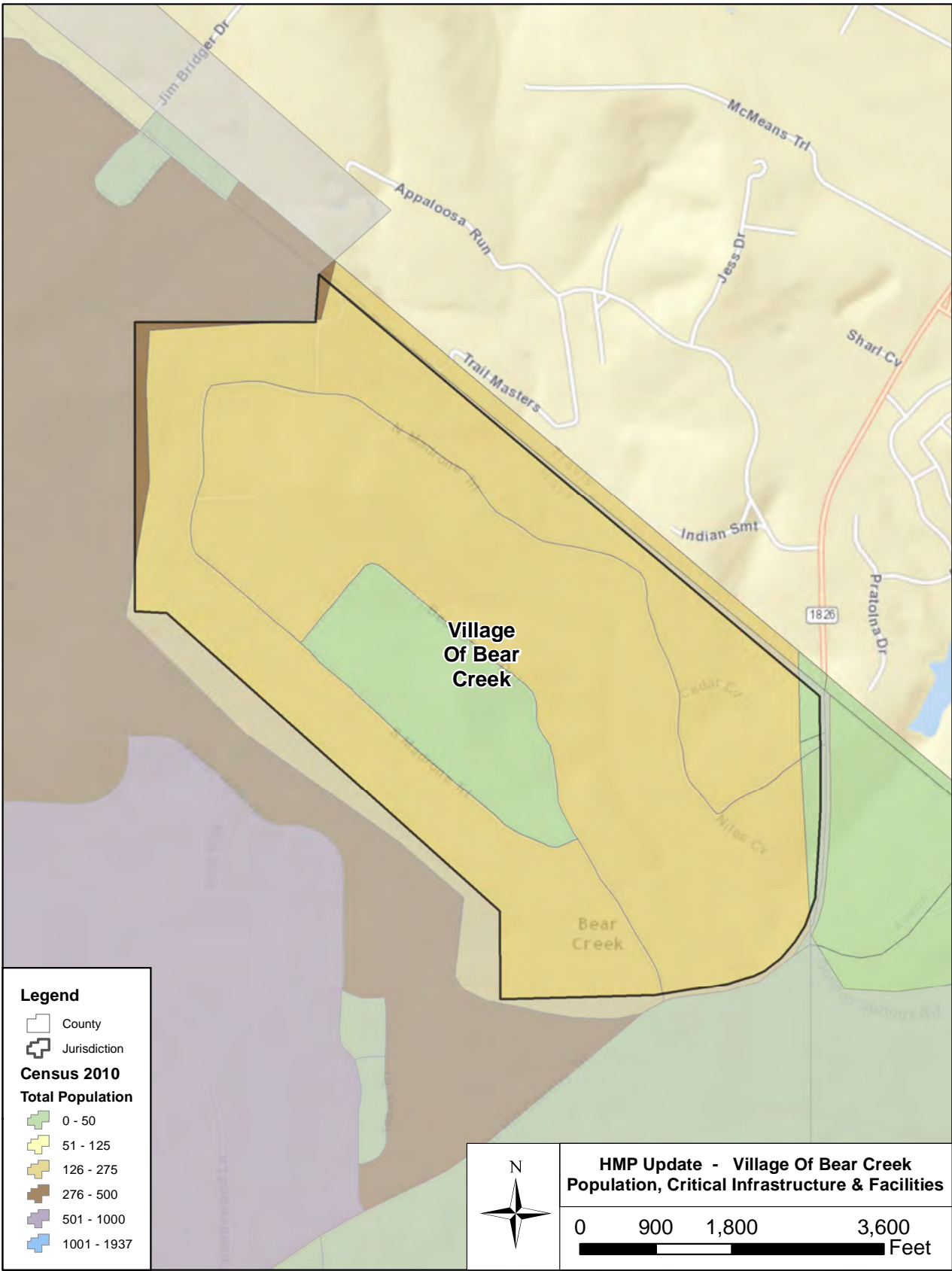
Risk Ranking Score: Highwater mark score of highest ranked hazard that is mitigated by the action

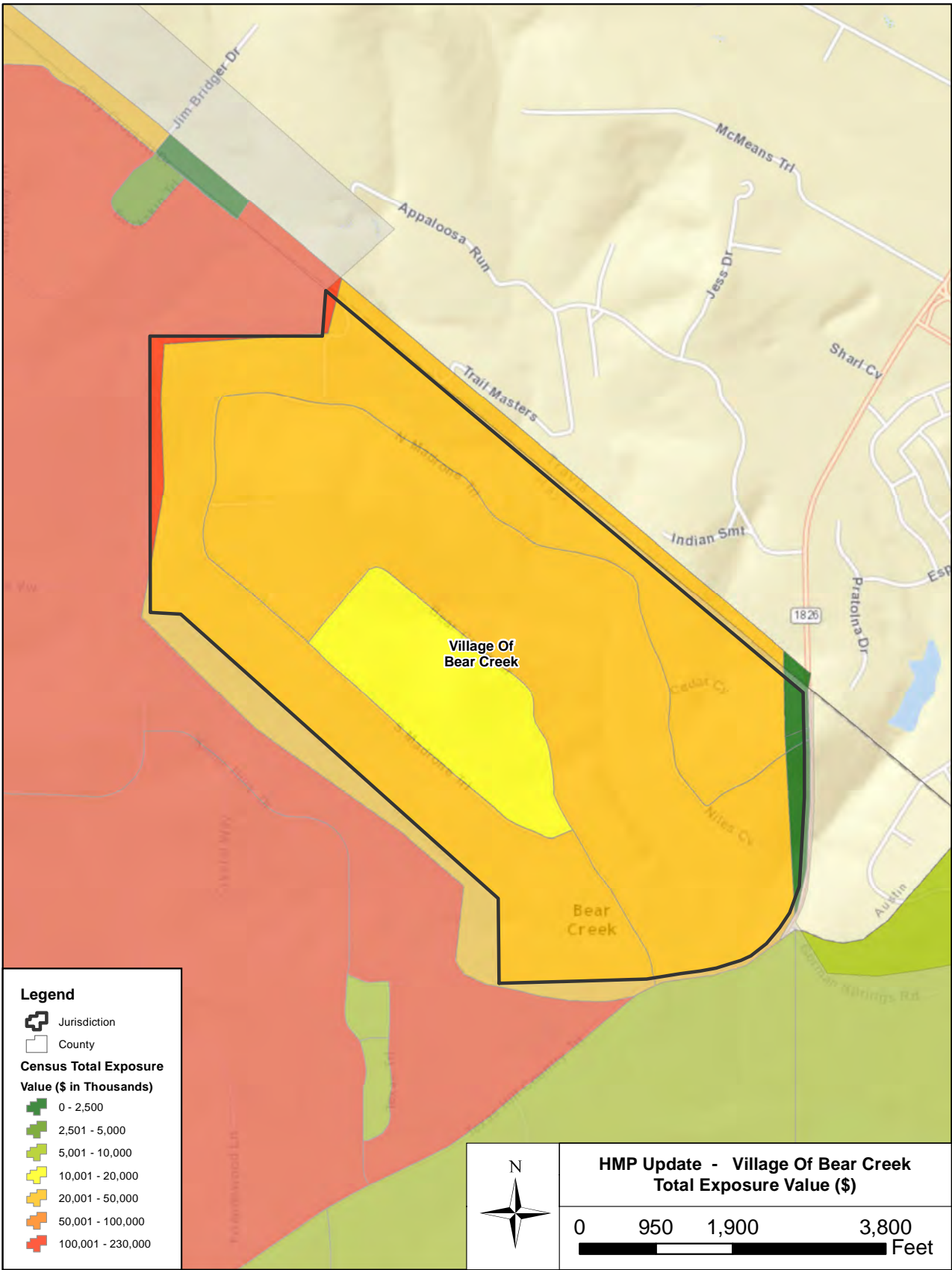
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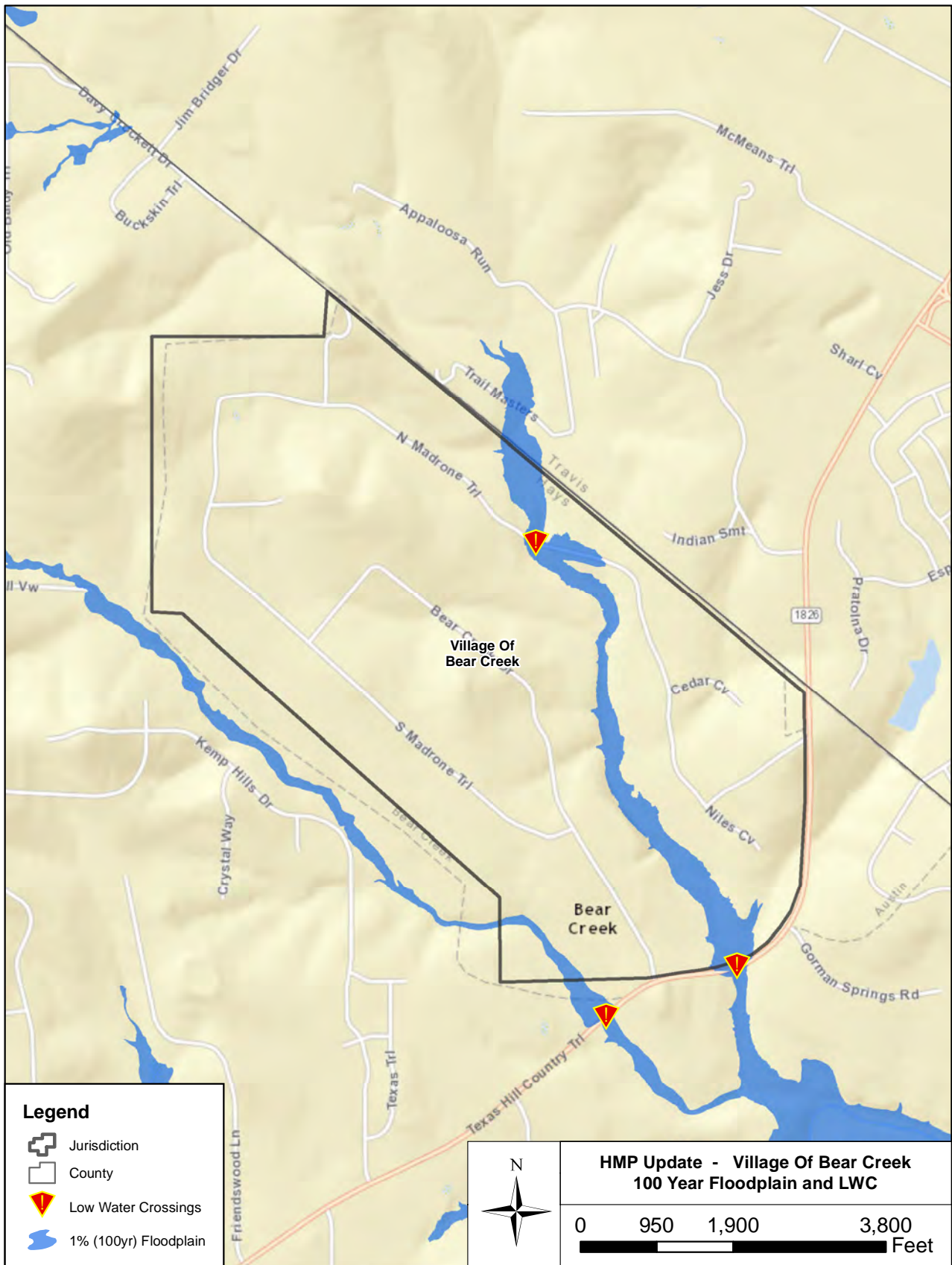
APPENDIX

D

Supplemental Maps









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Maps for Reference Only



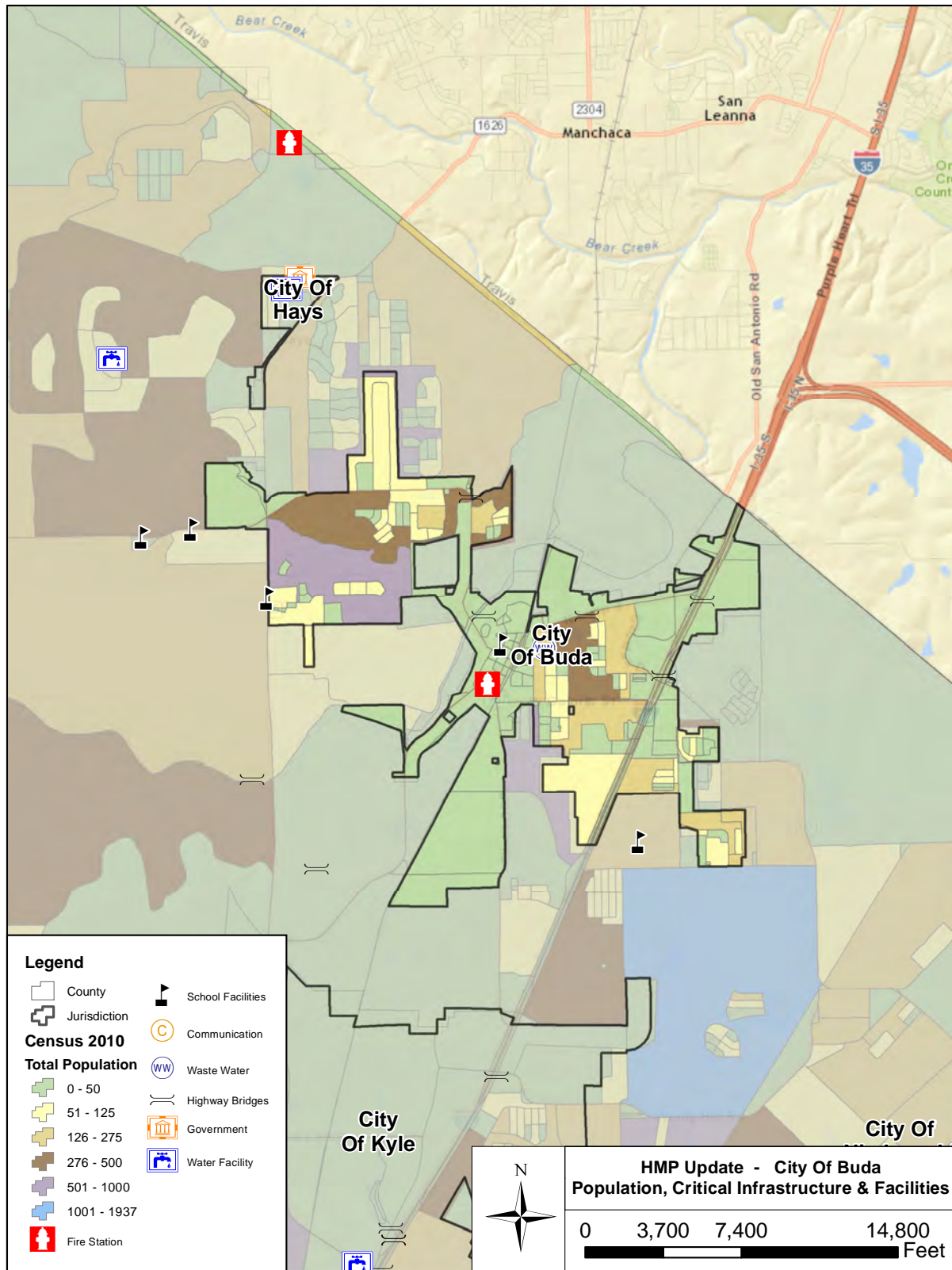
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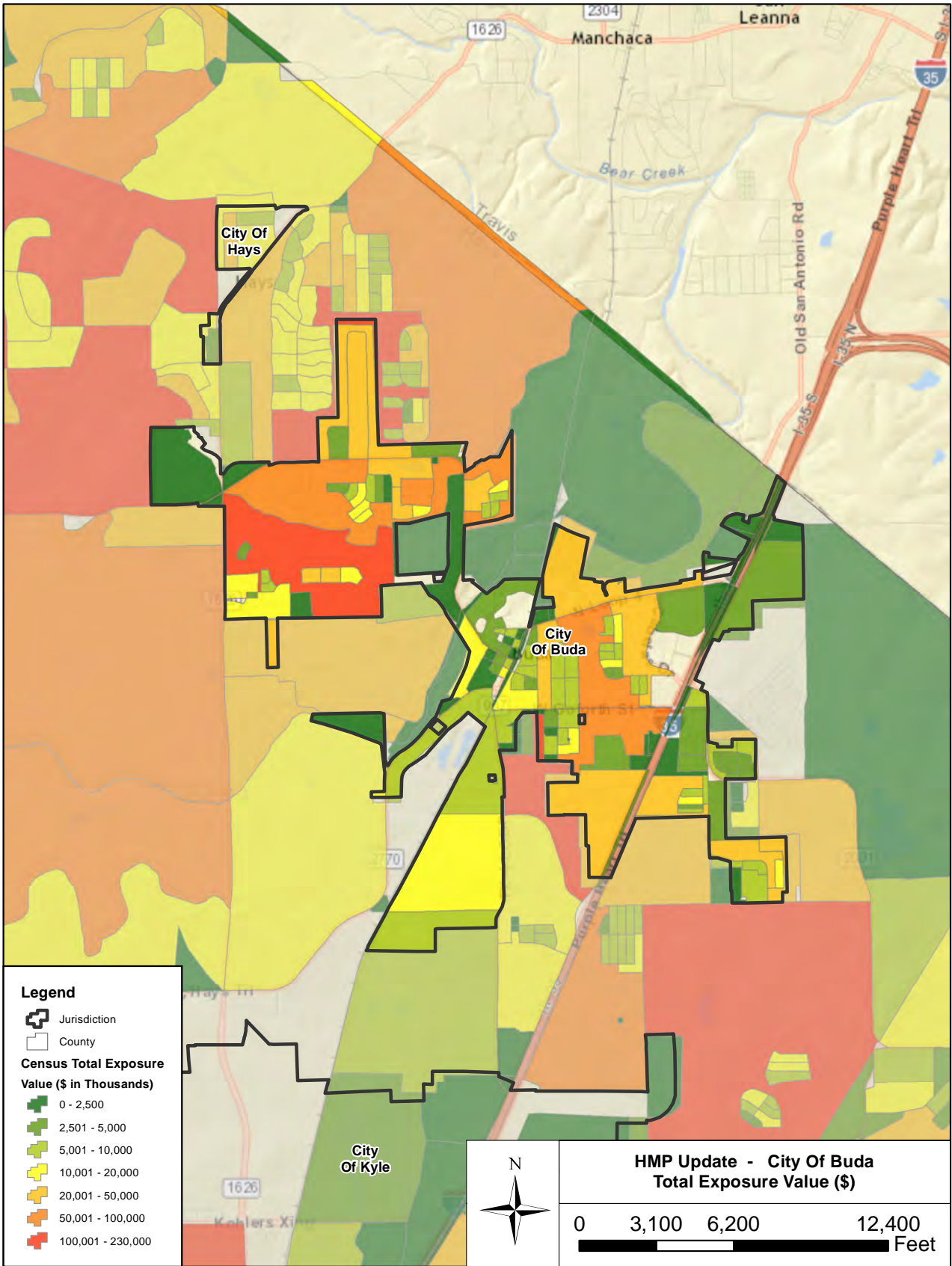
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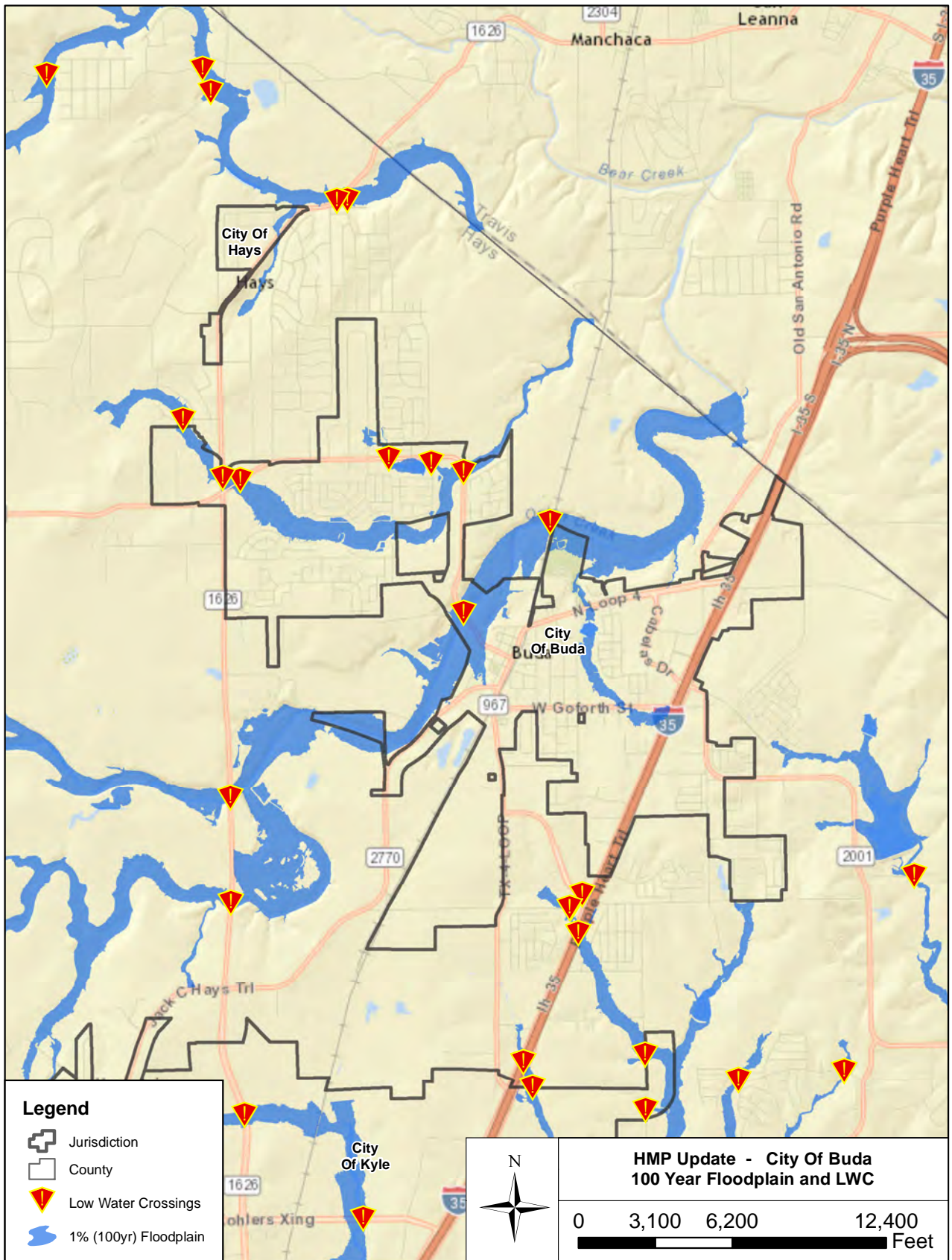


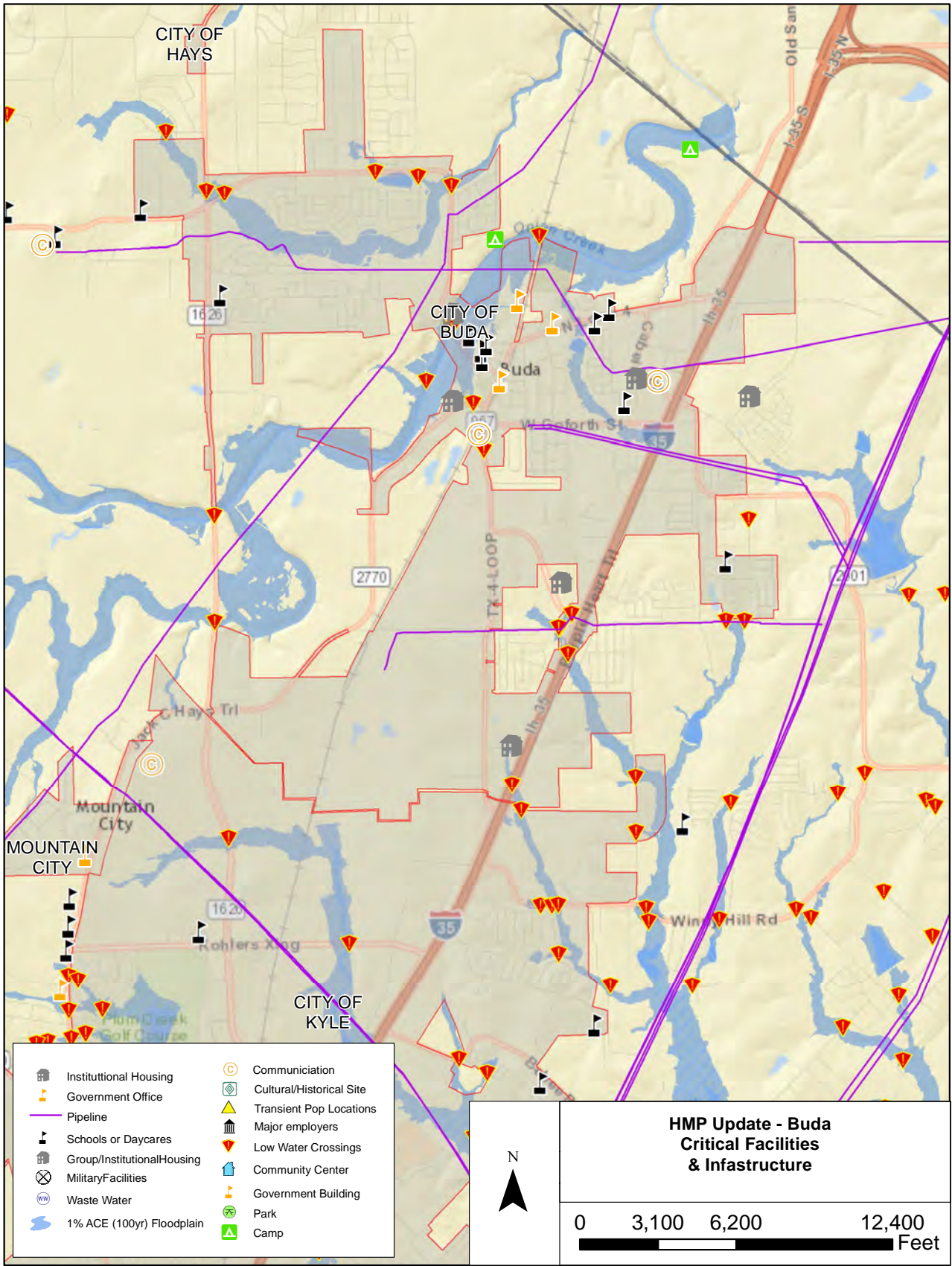
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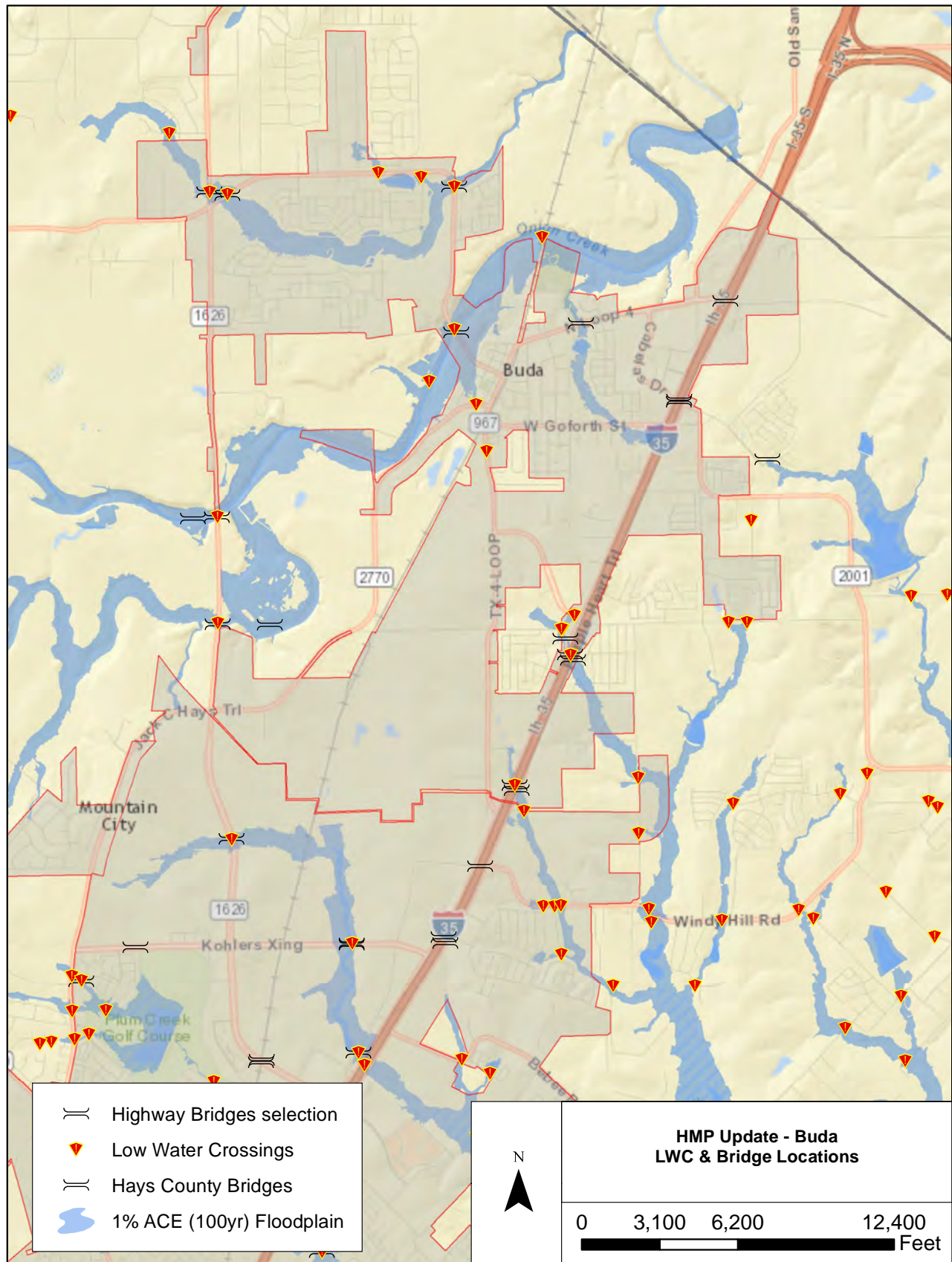






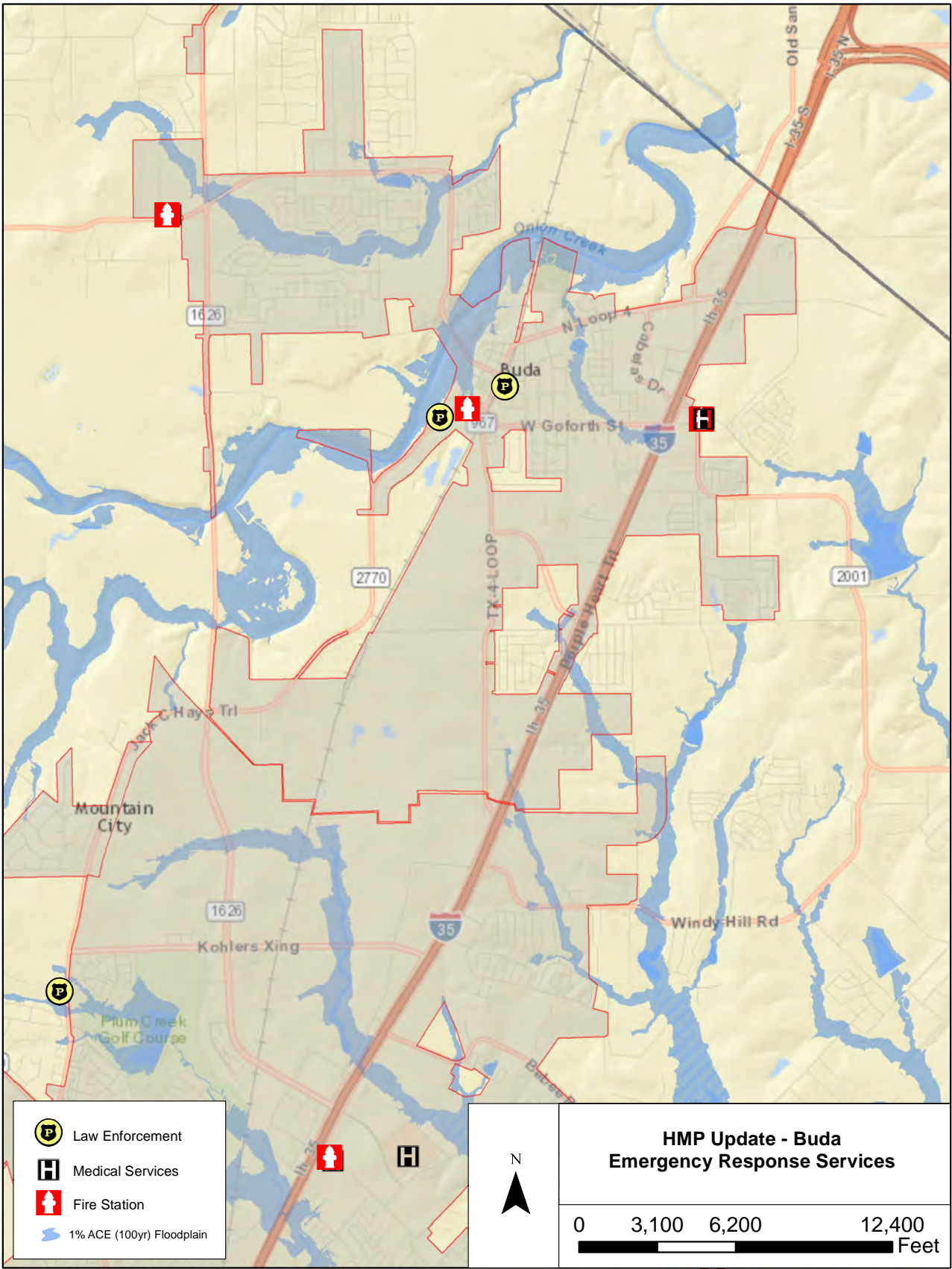
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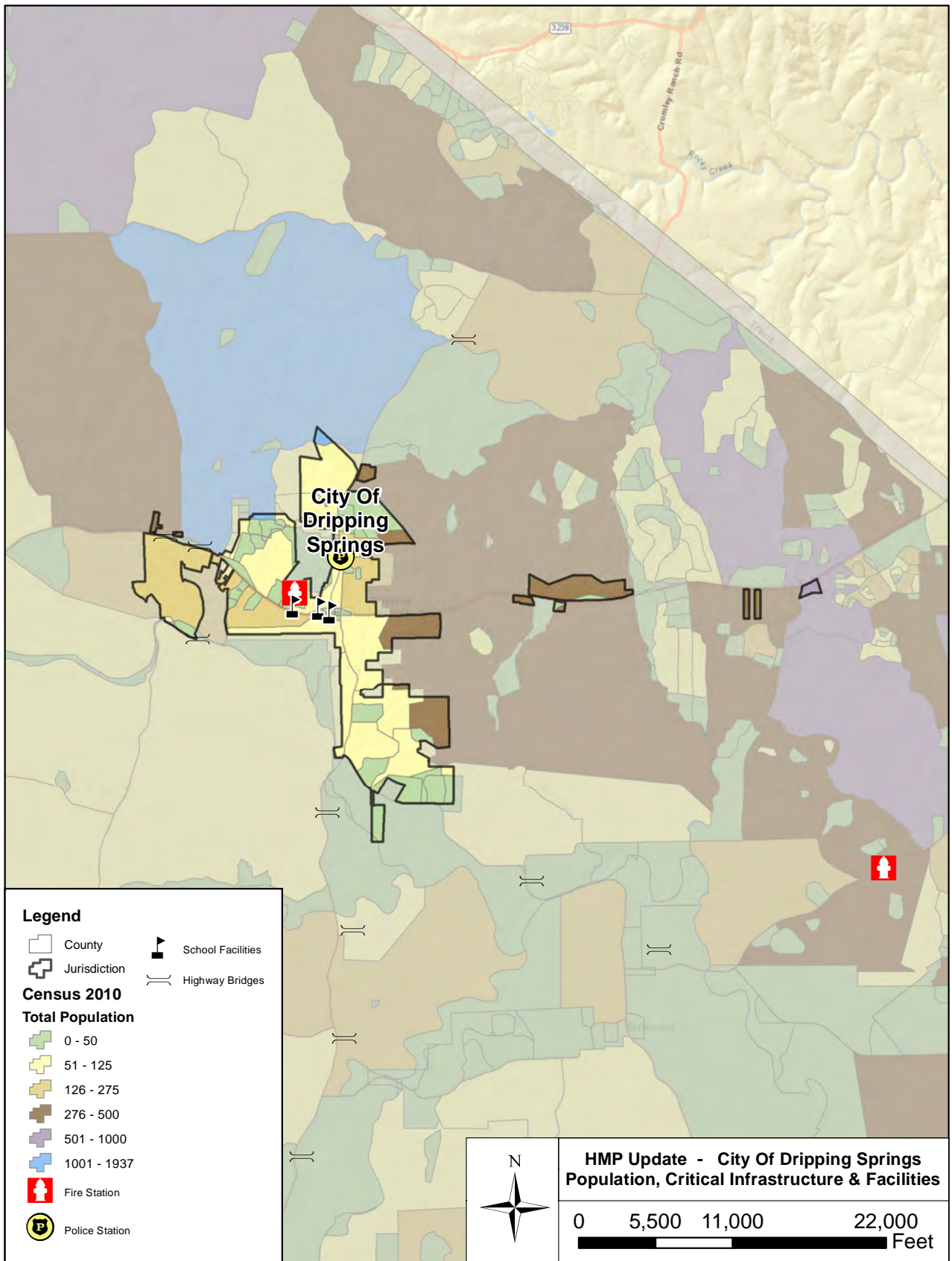


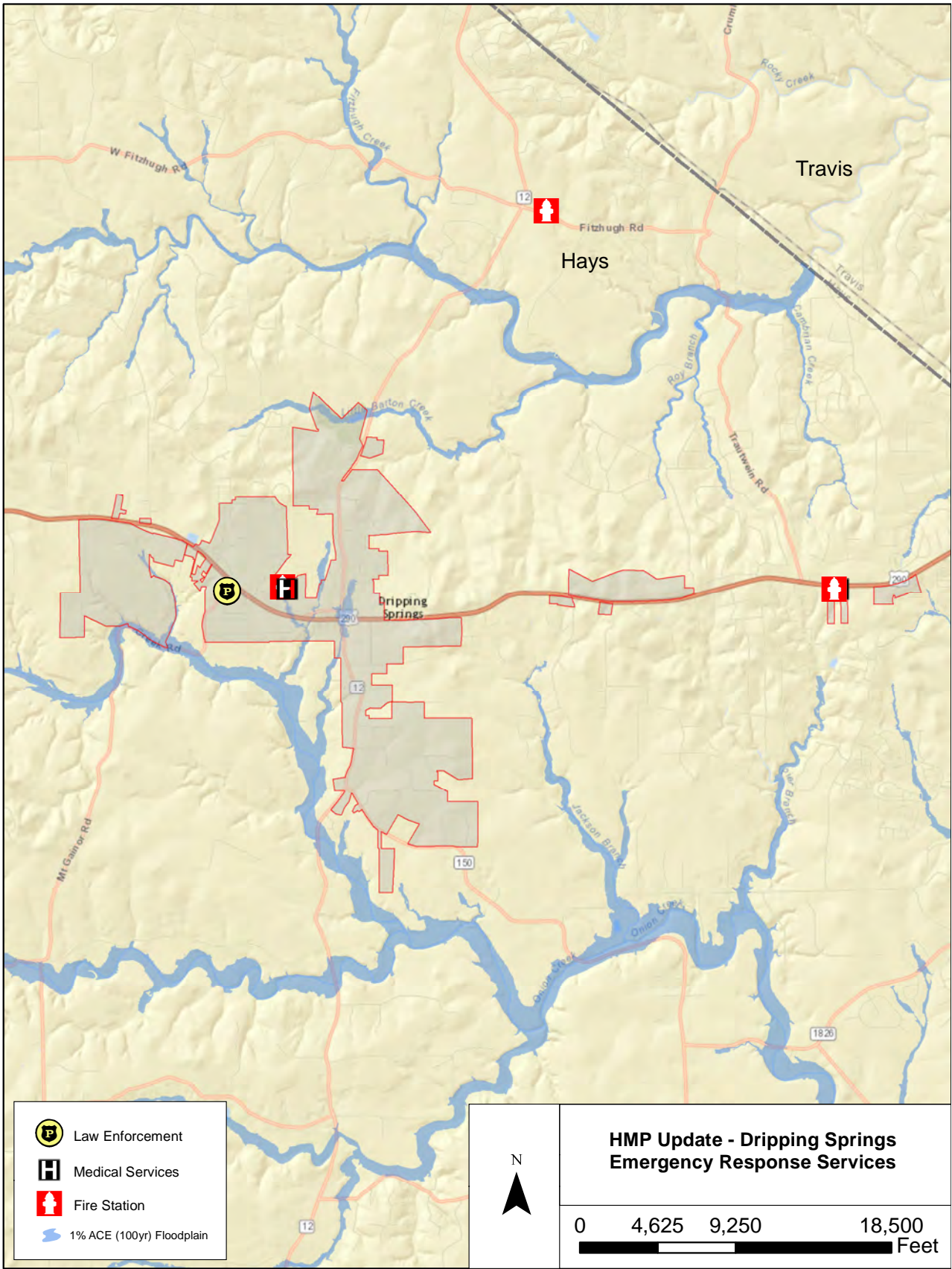
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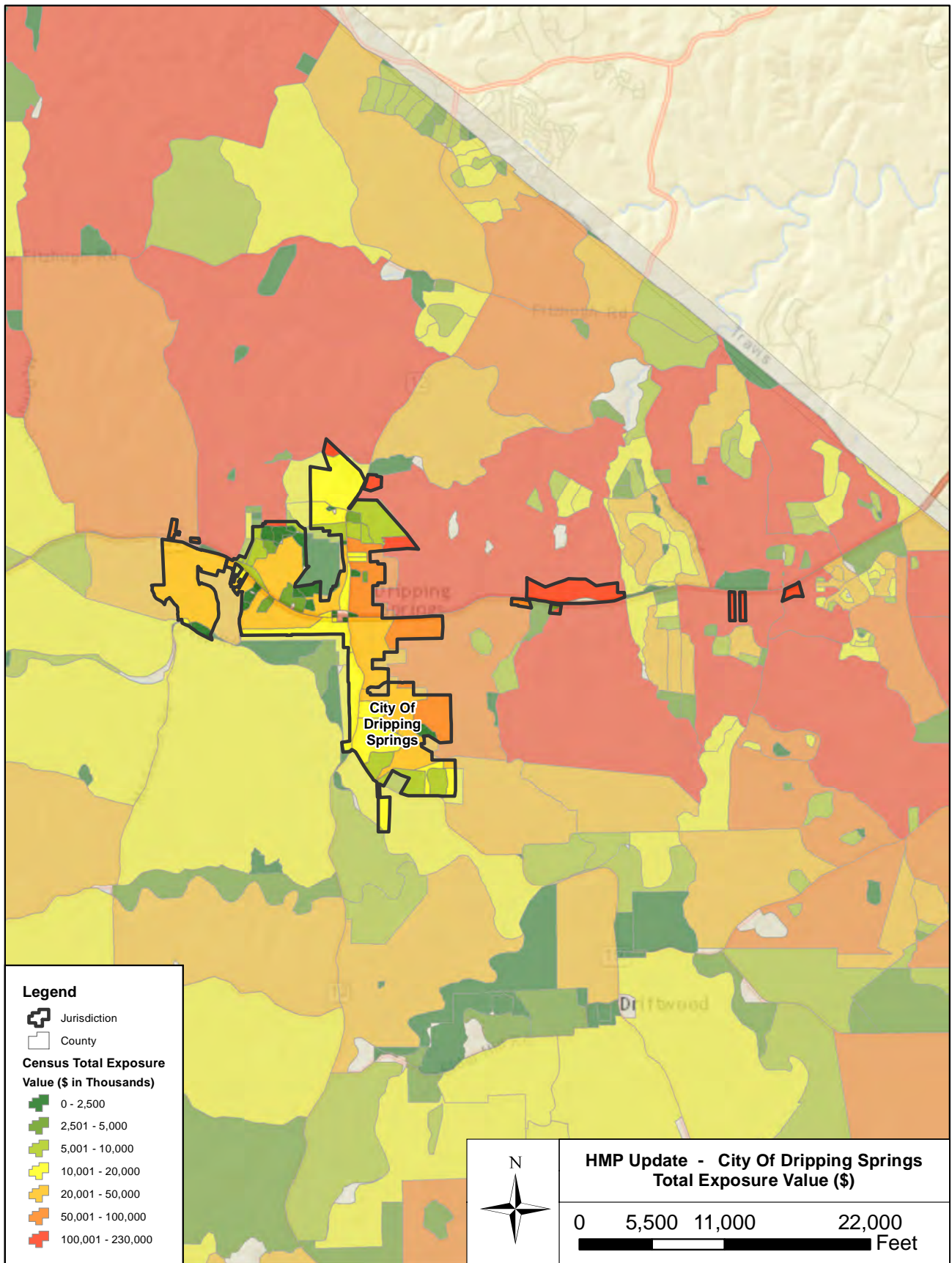
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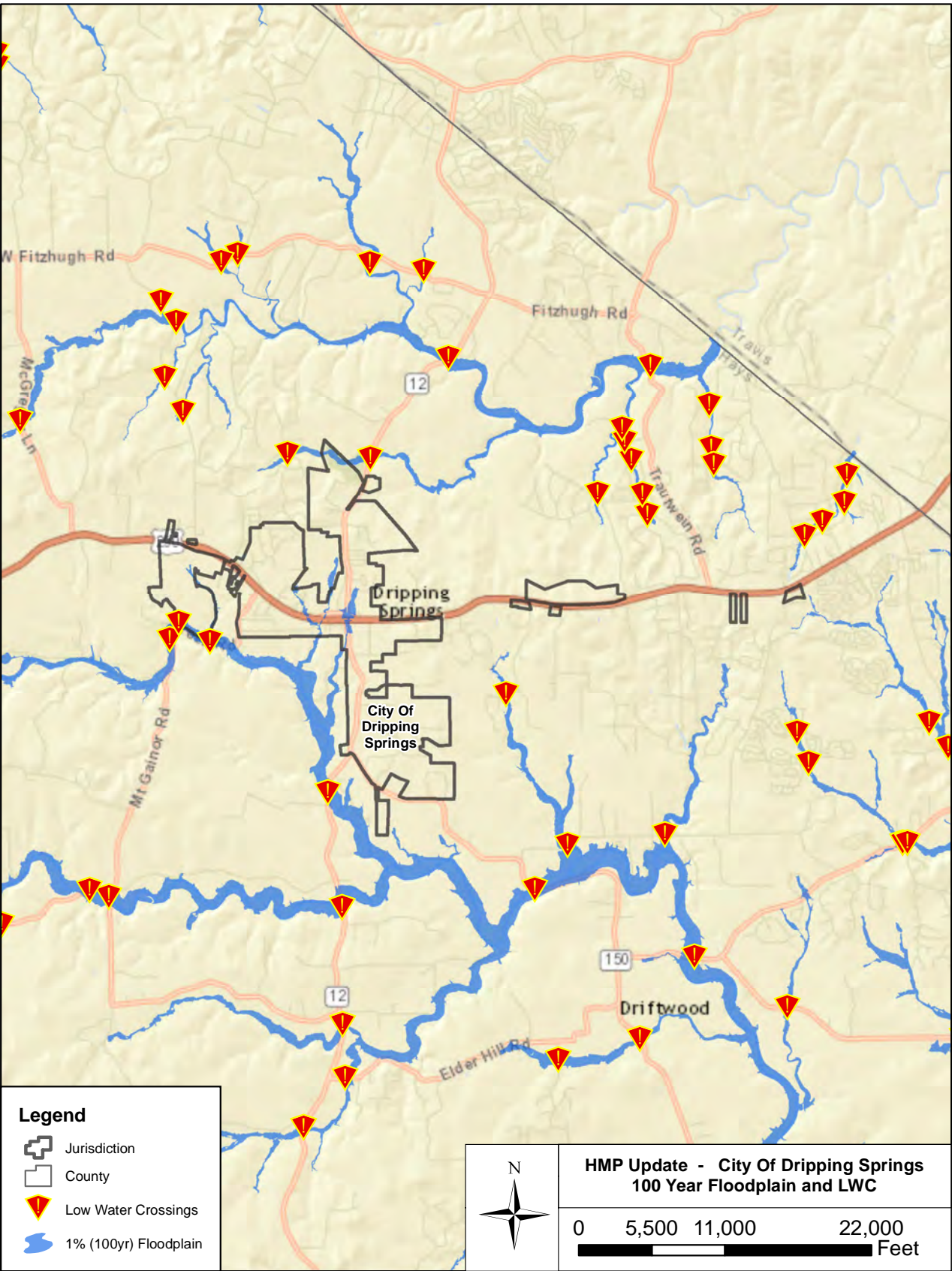


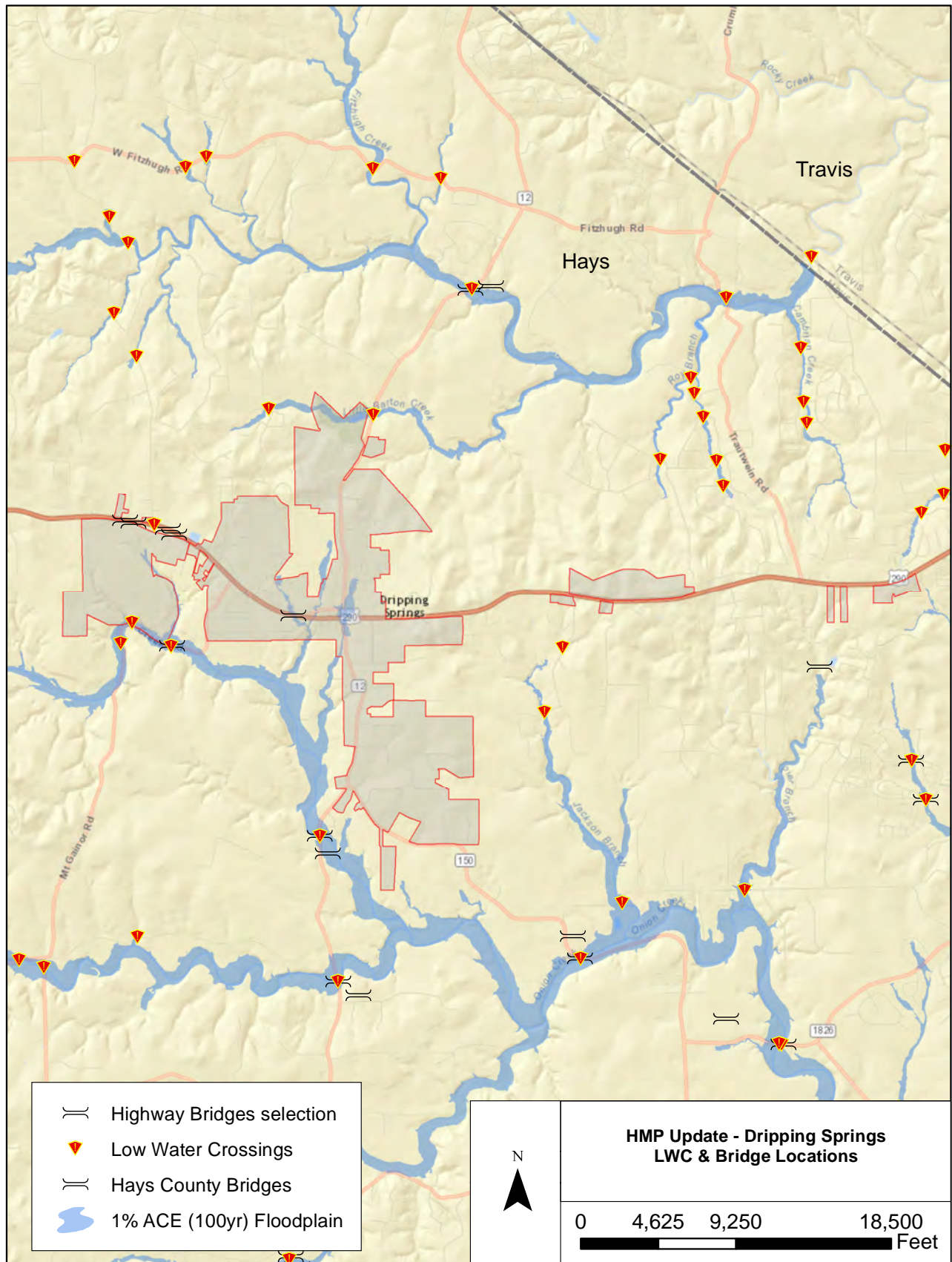


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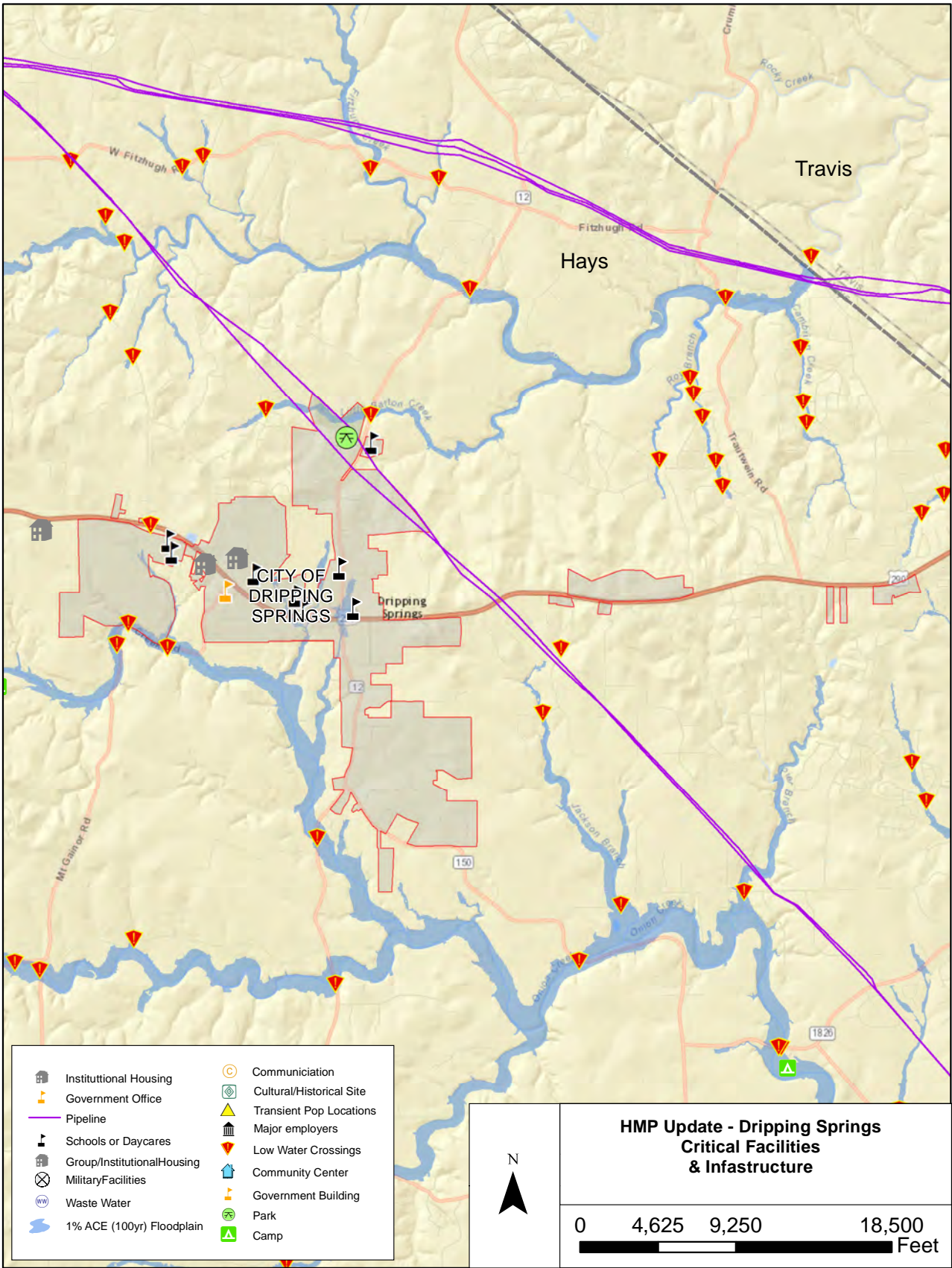




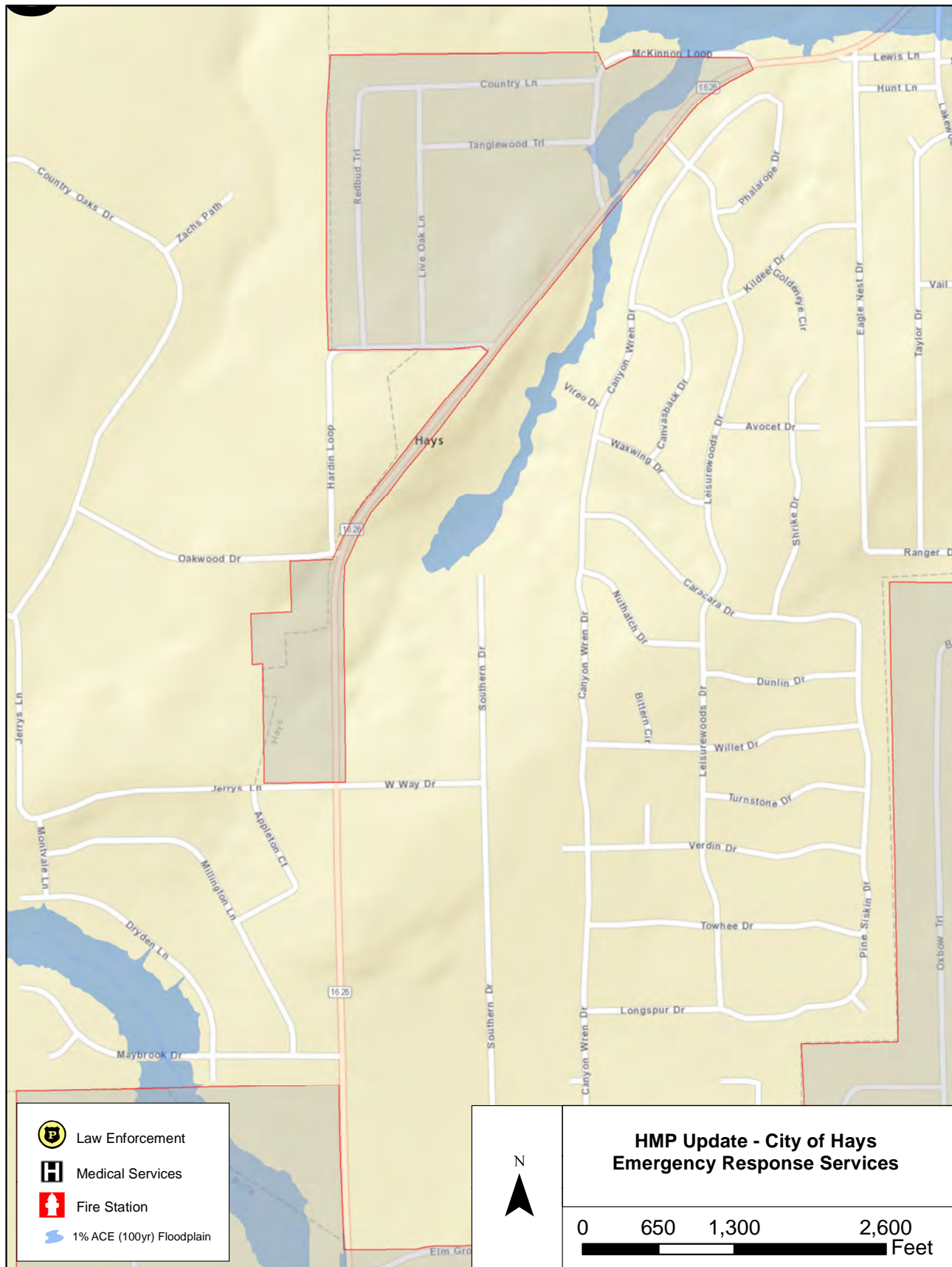


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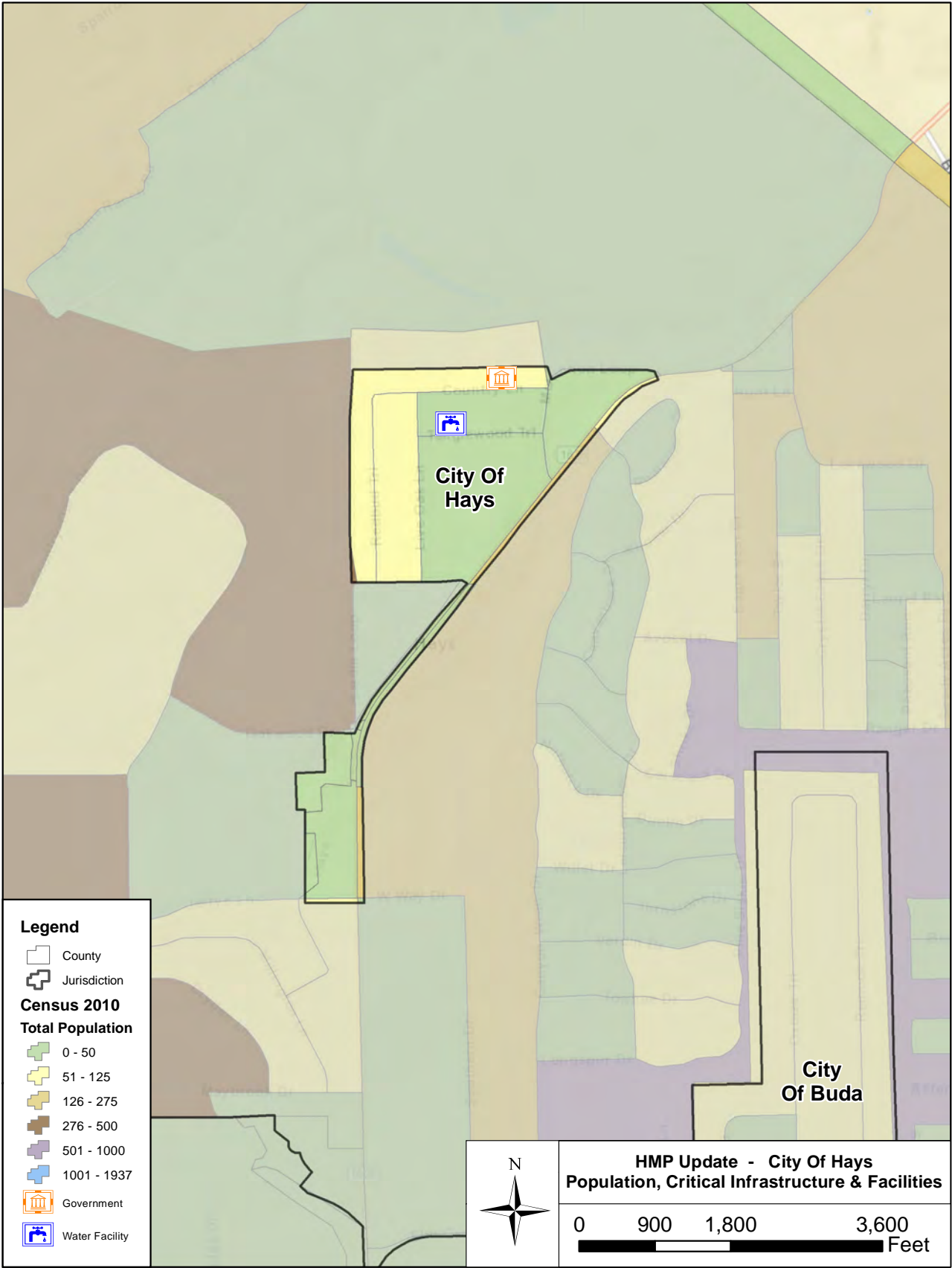
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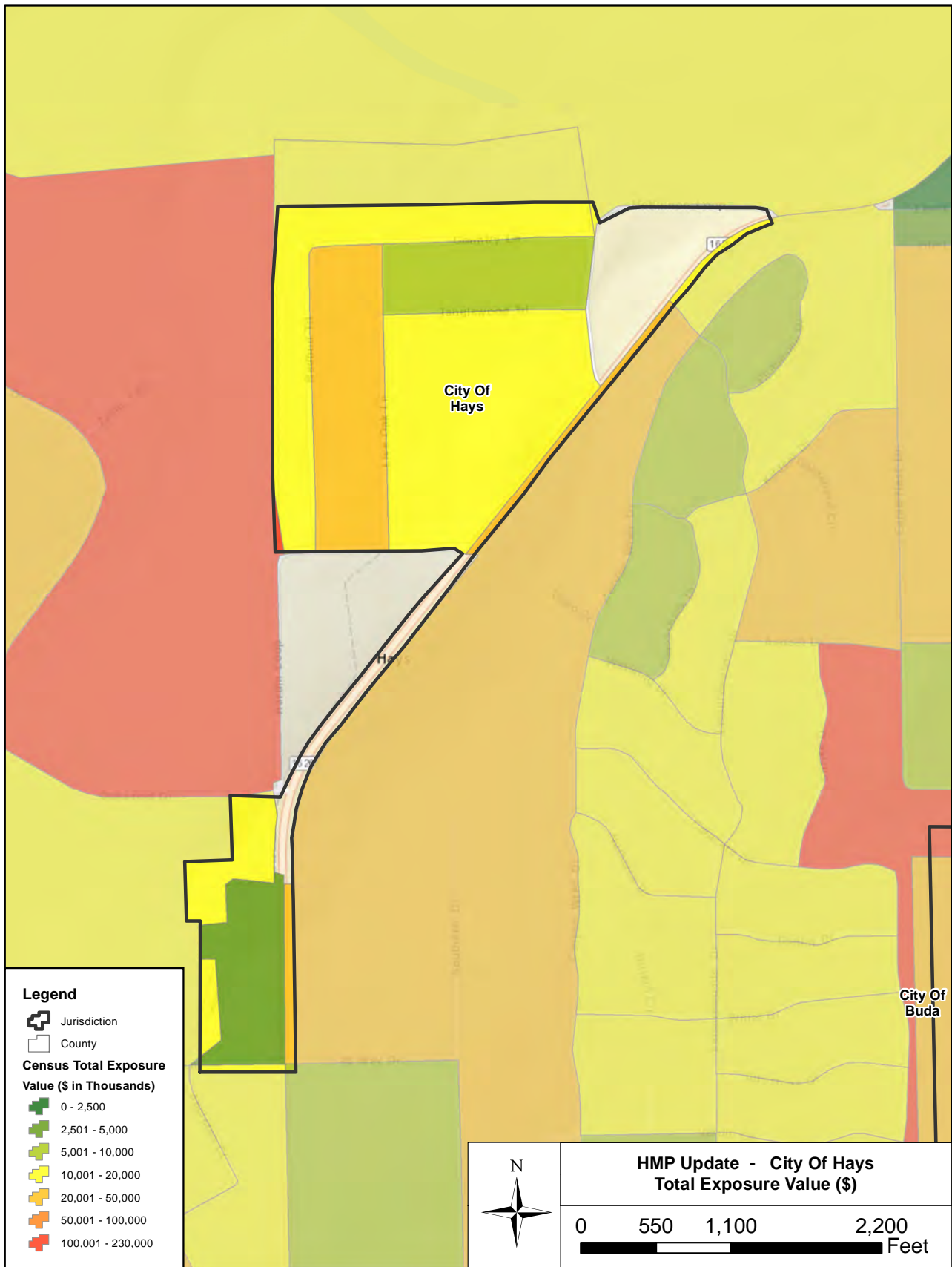


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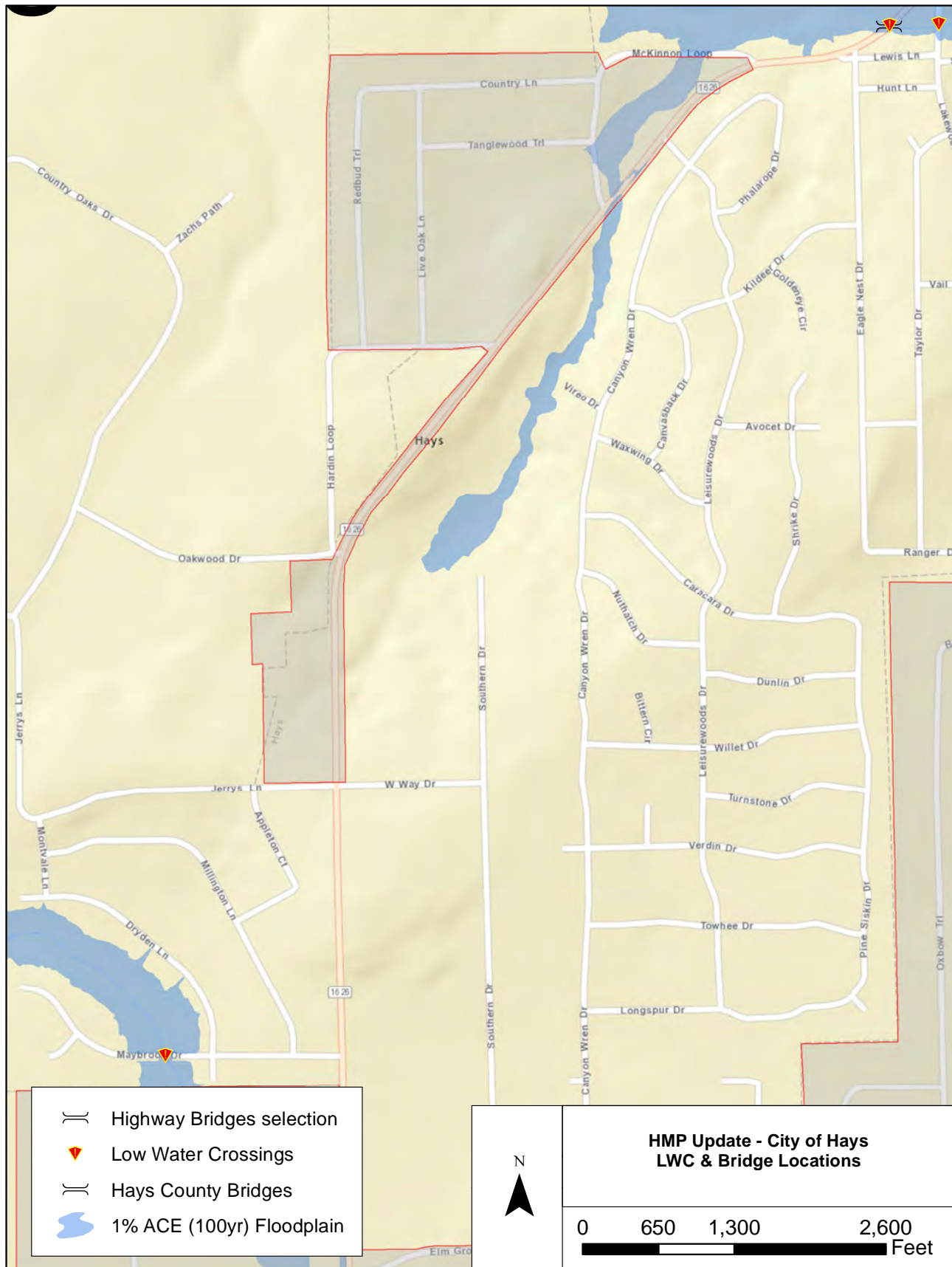


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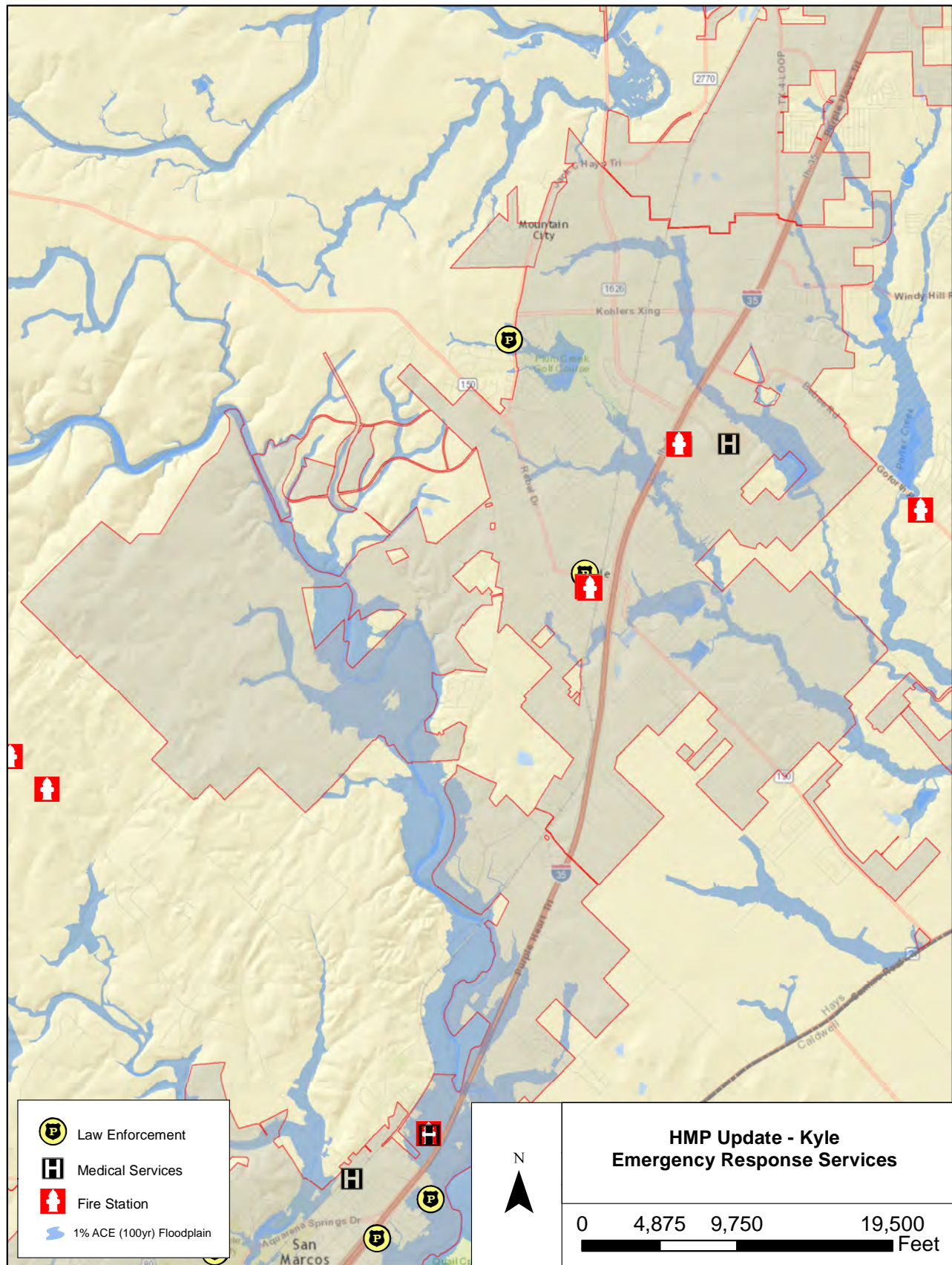


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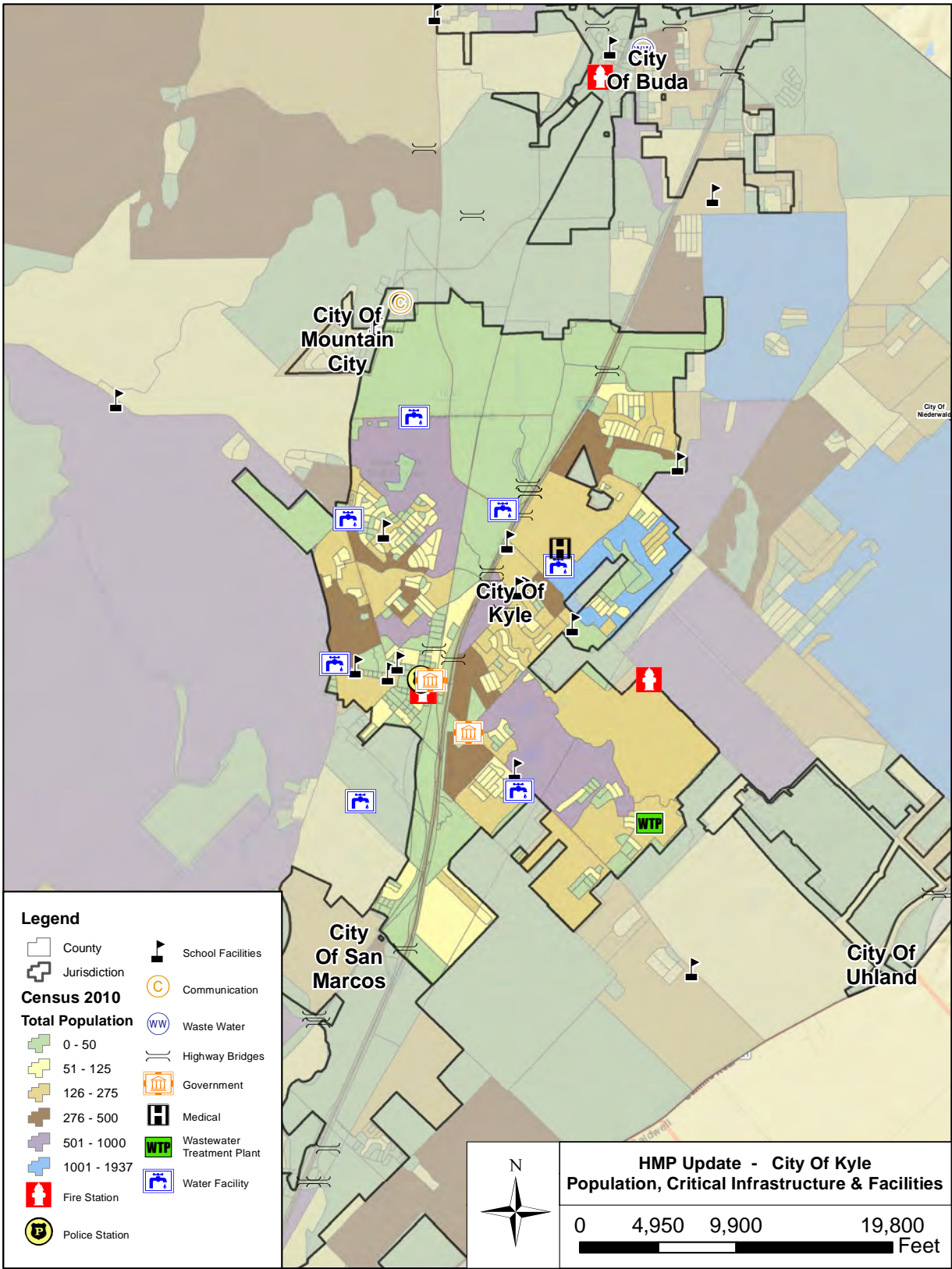
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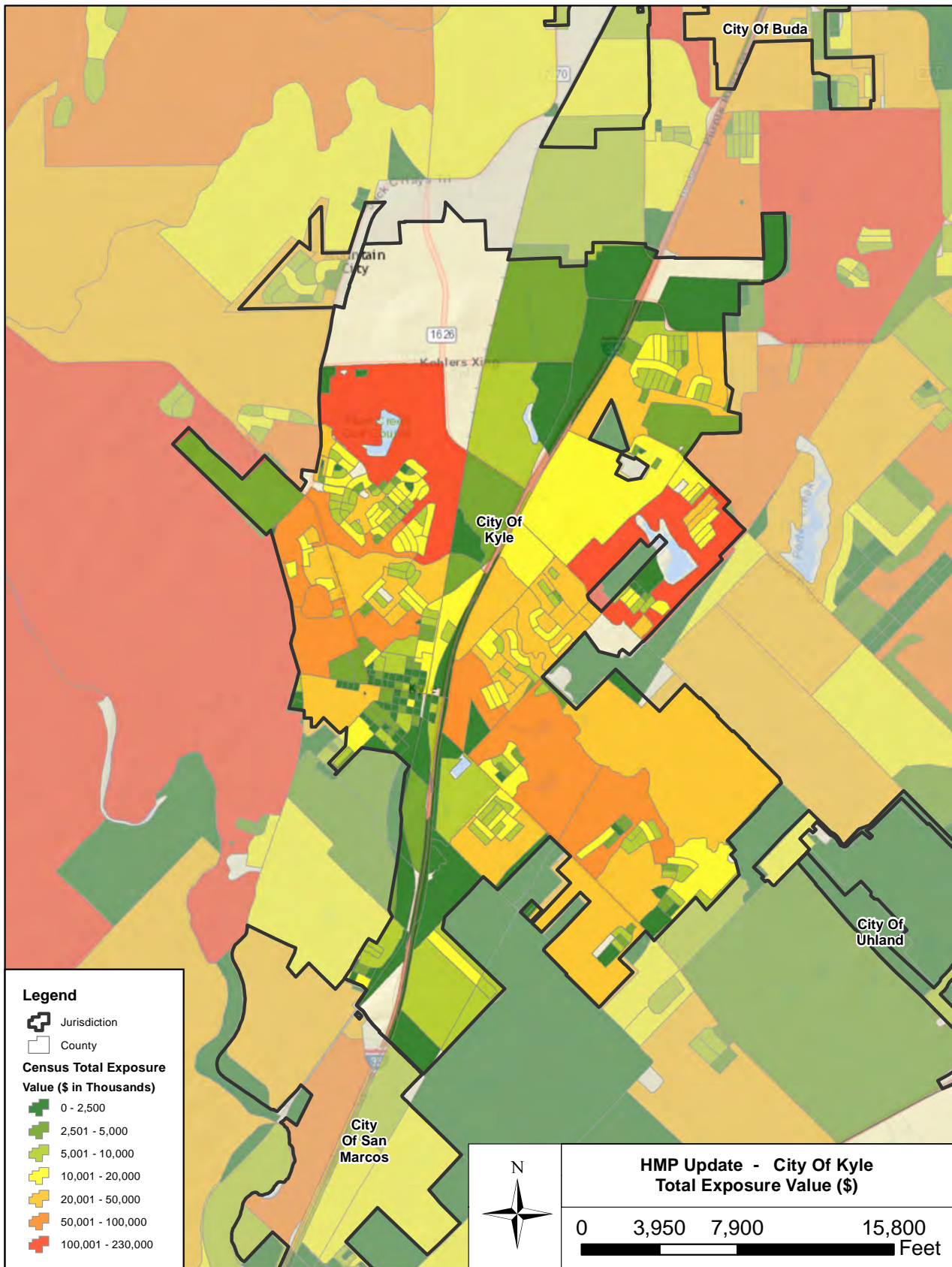
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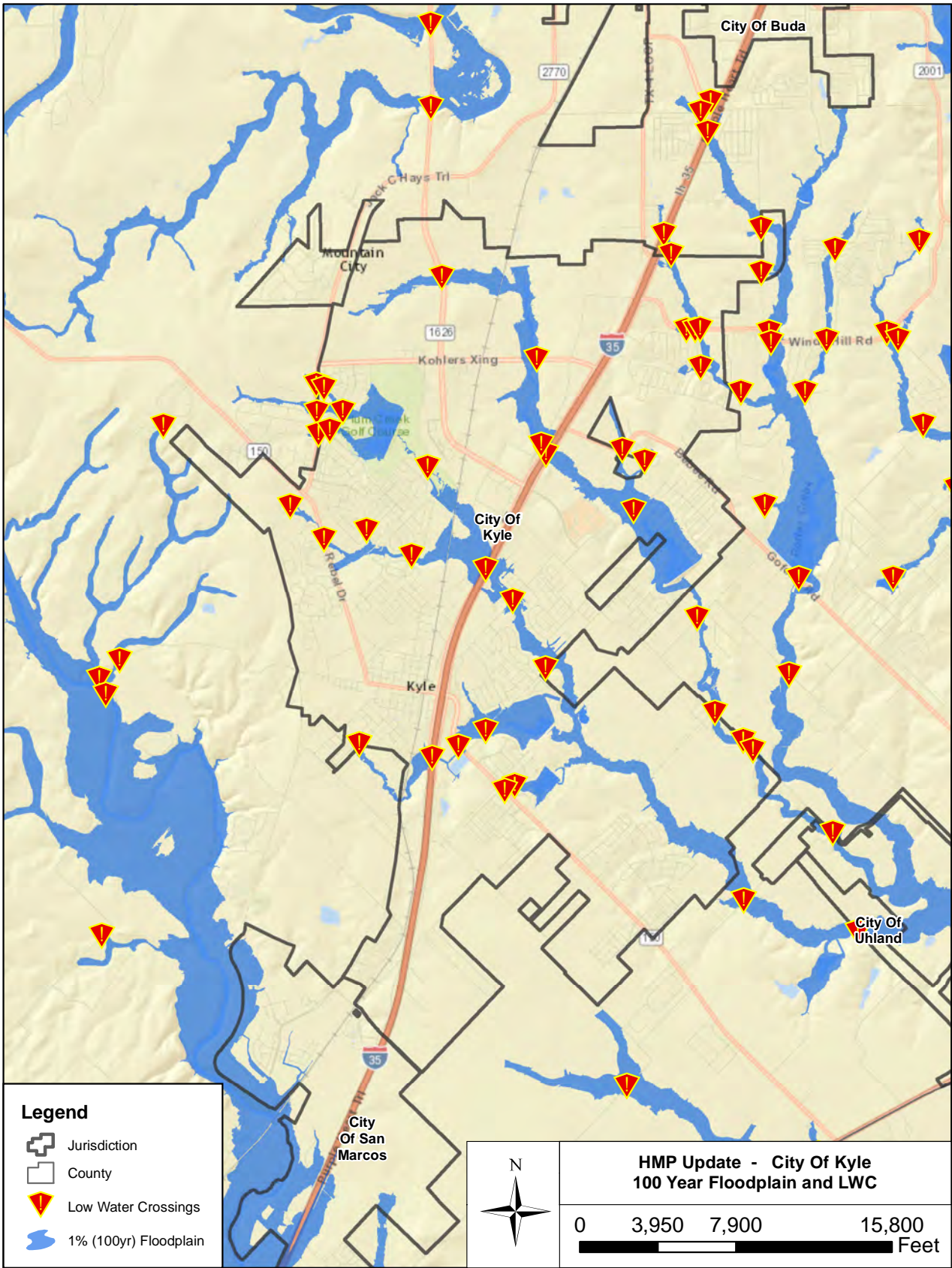


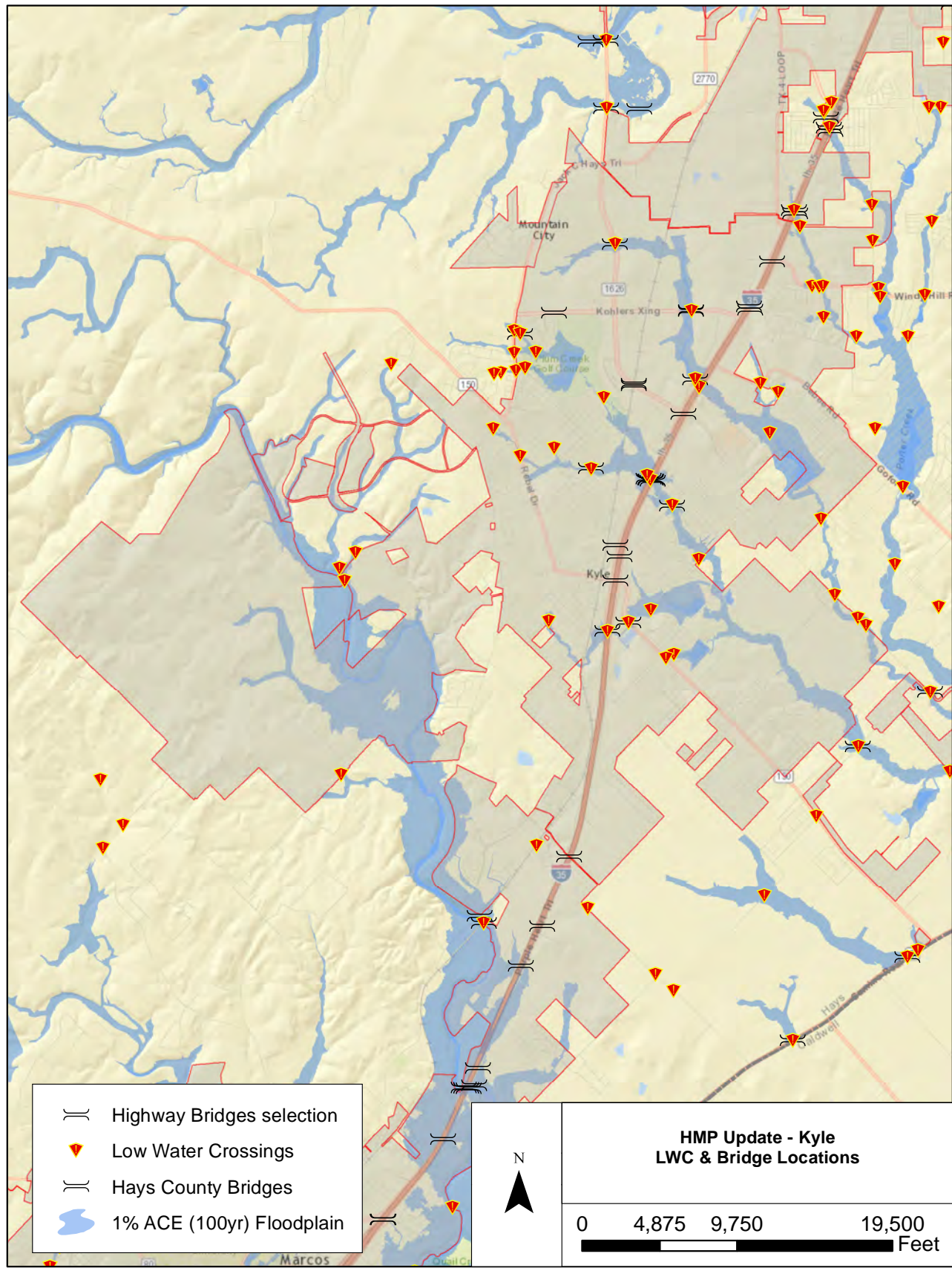
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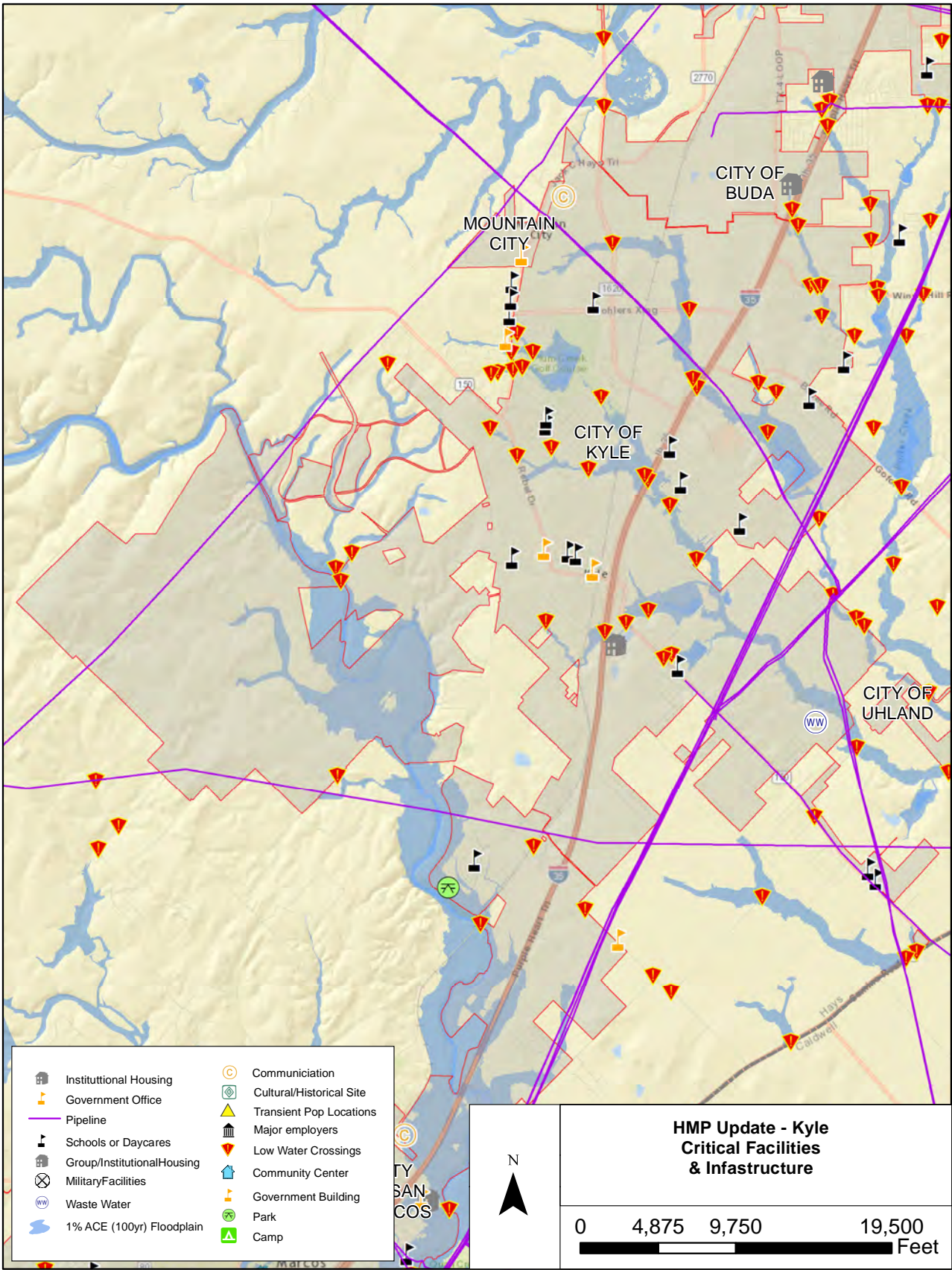




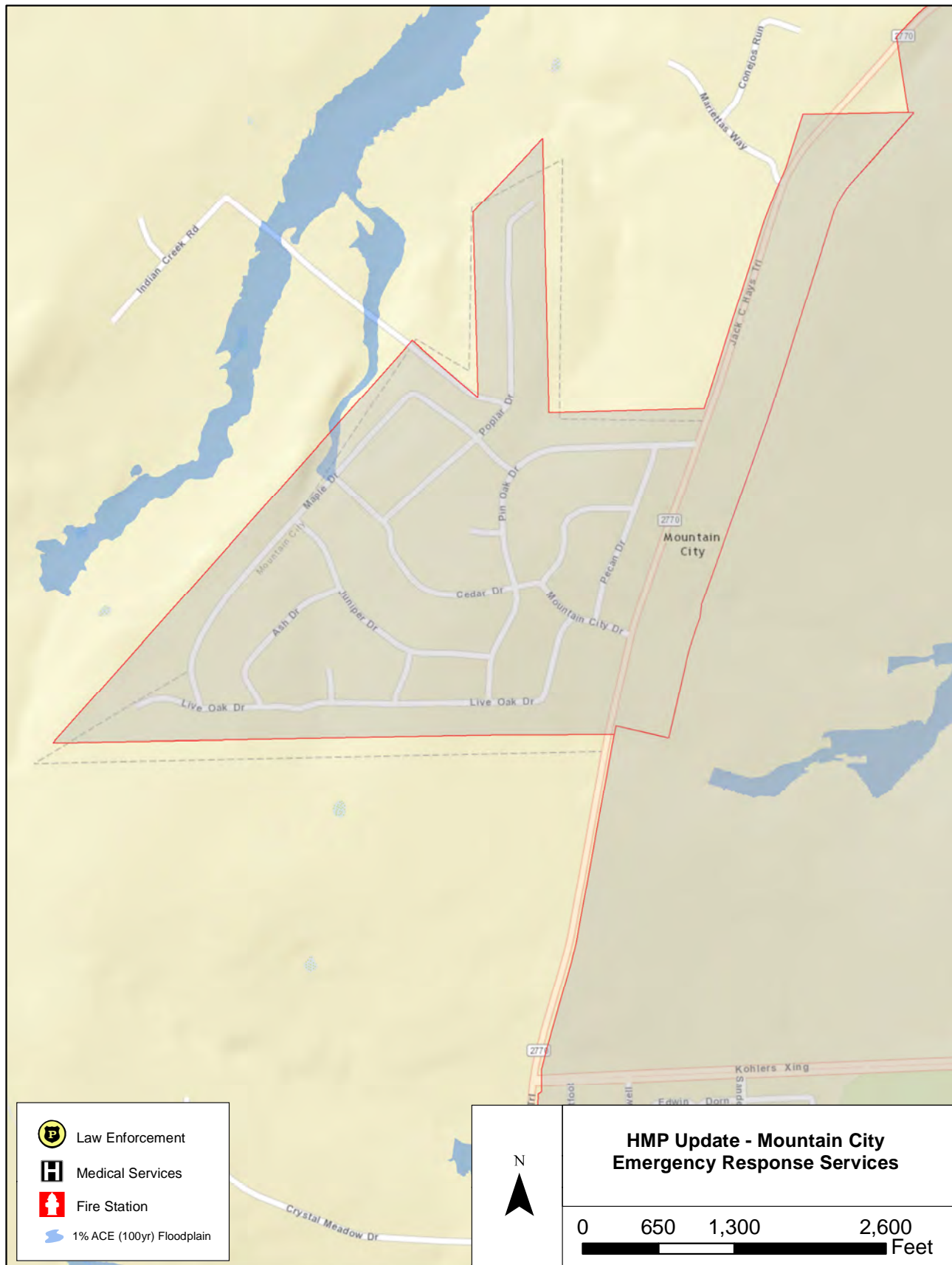


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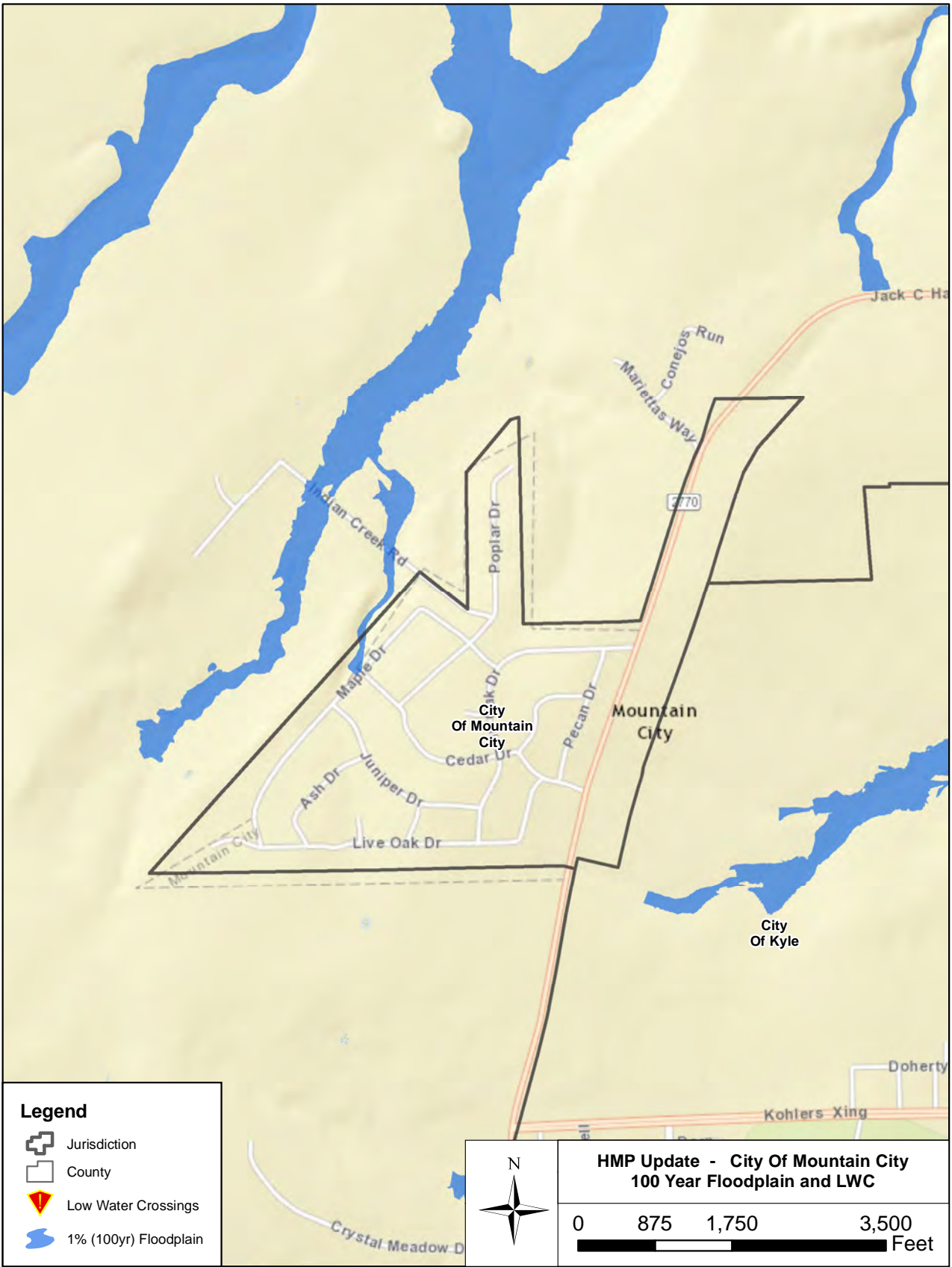
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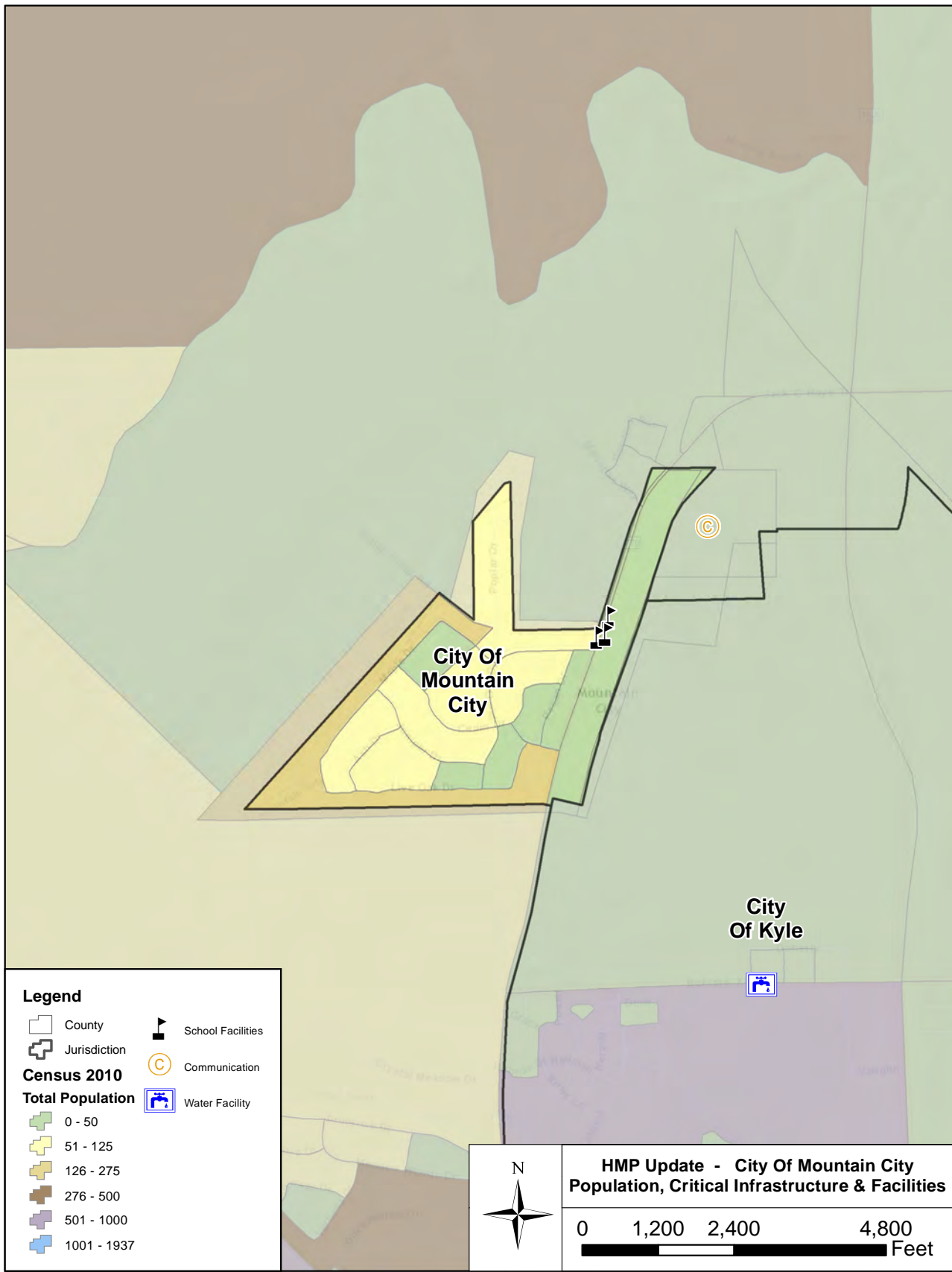


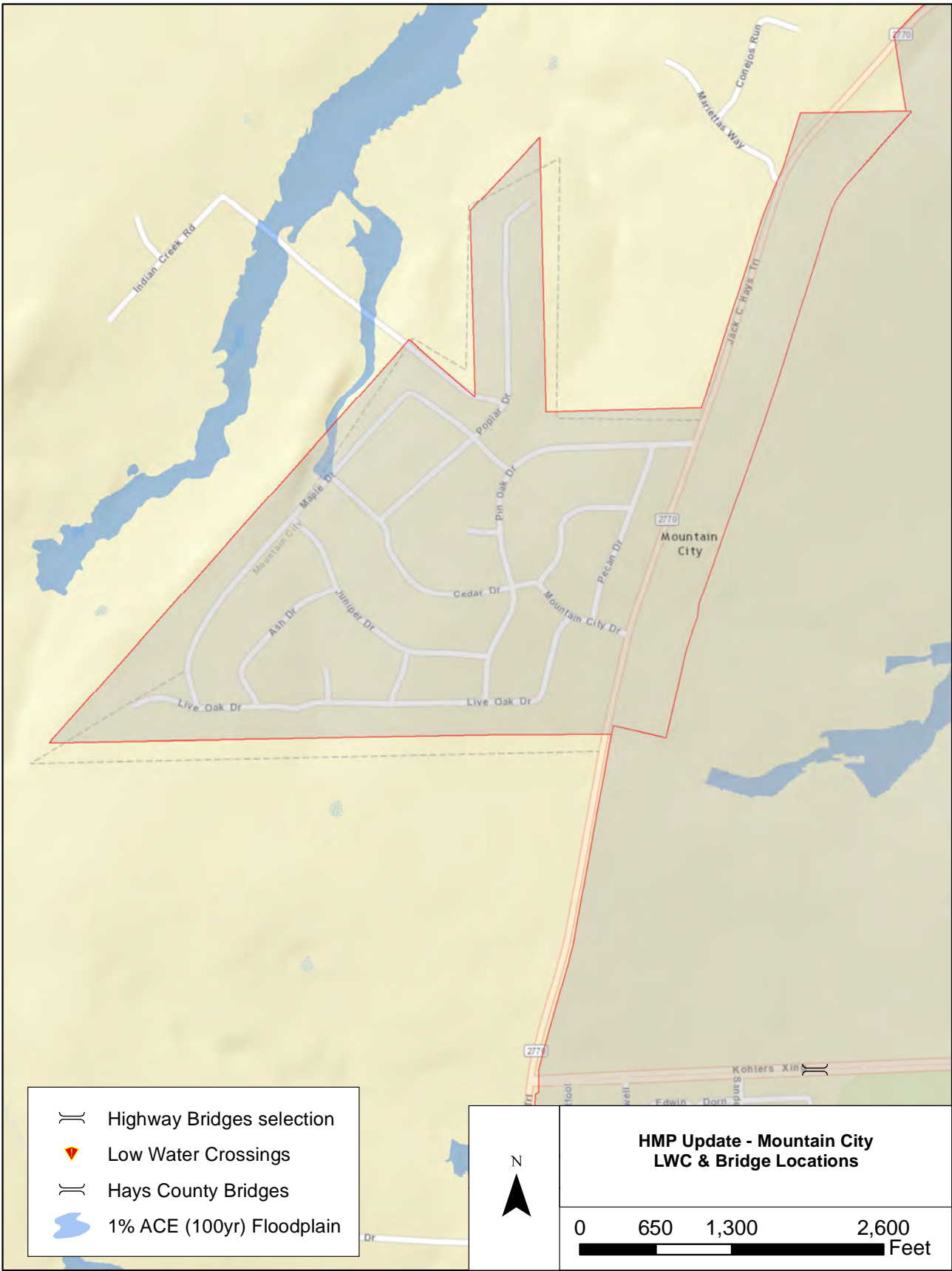
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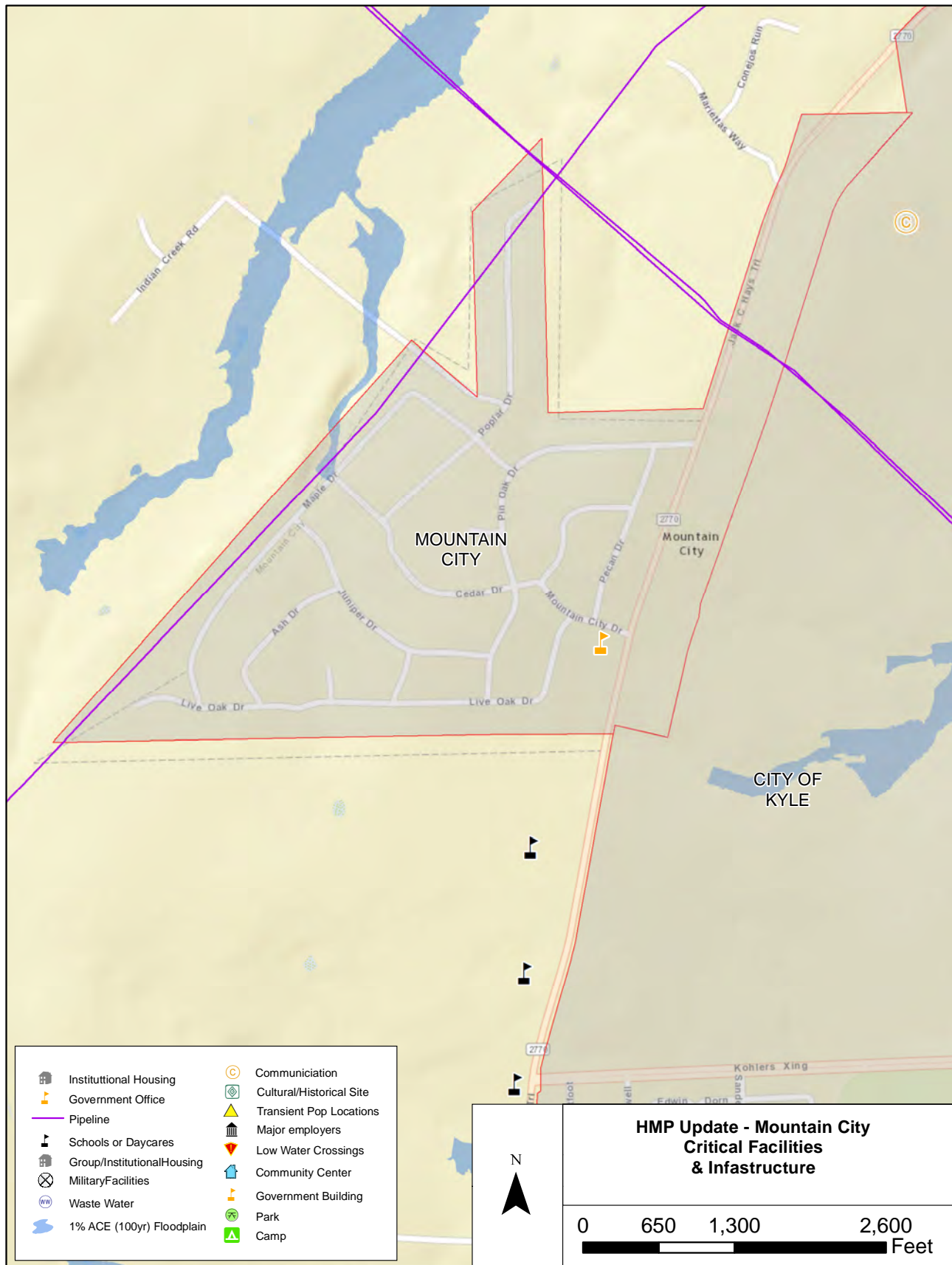
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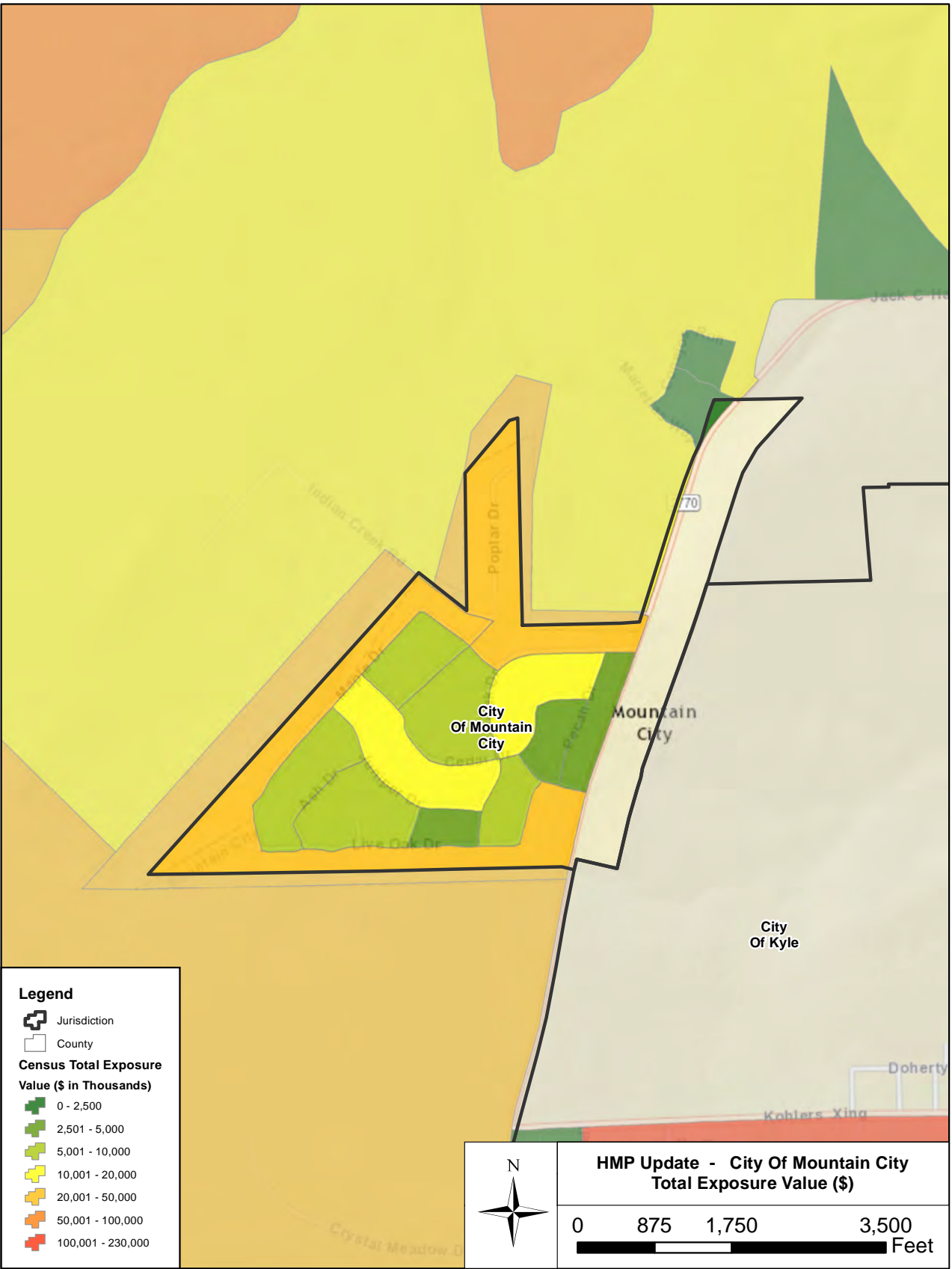


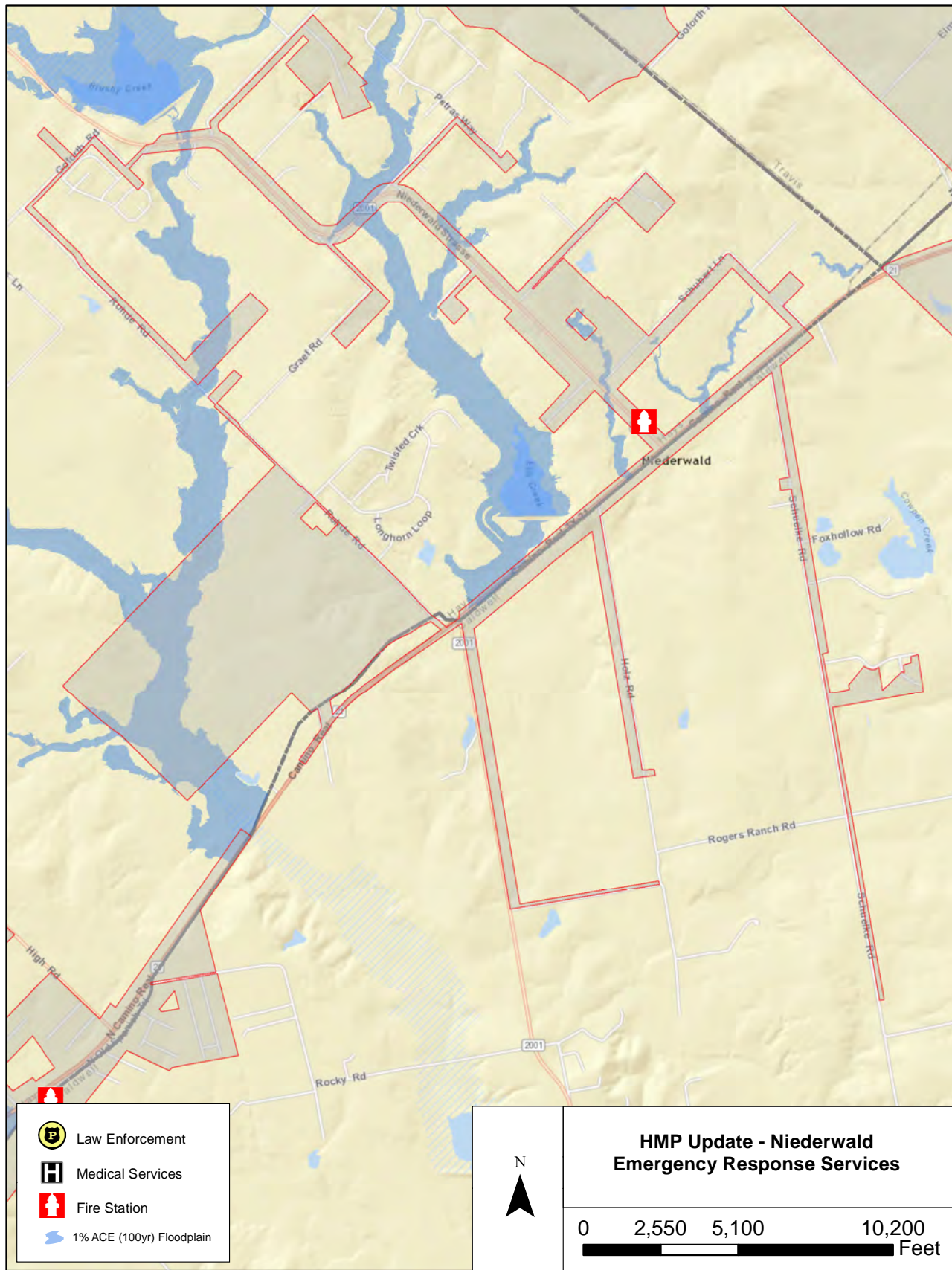


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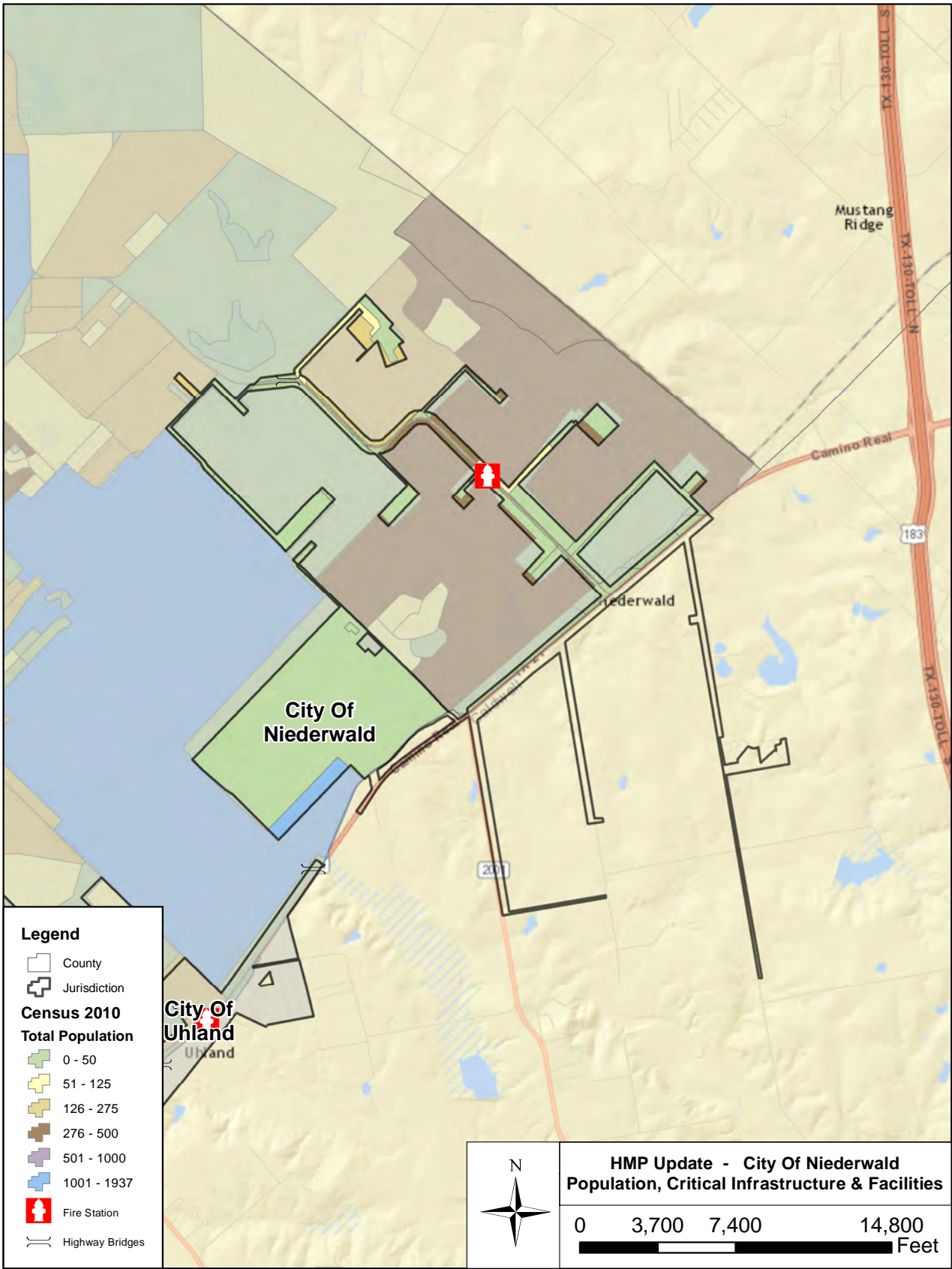


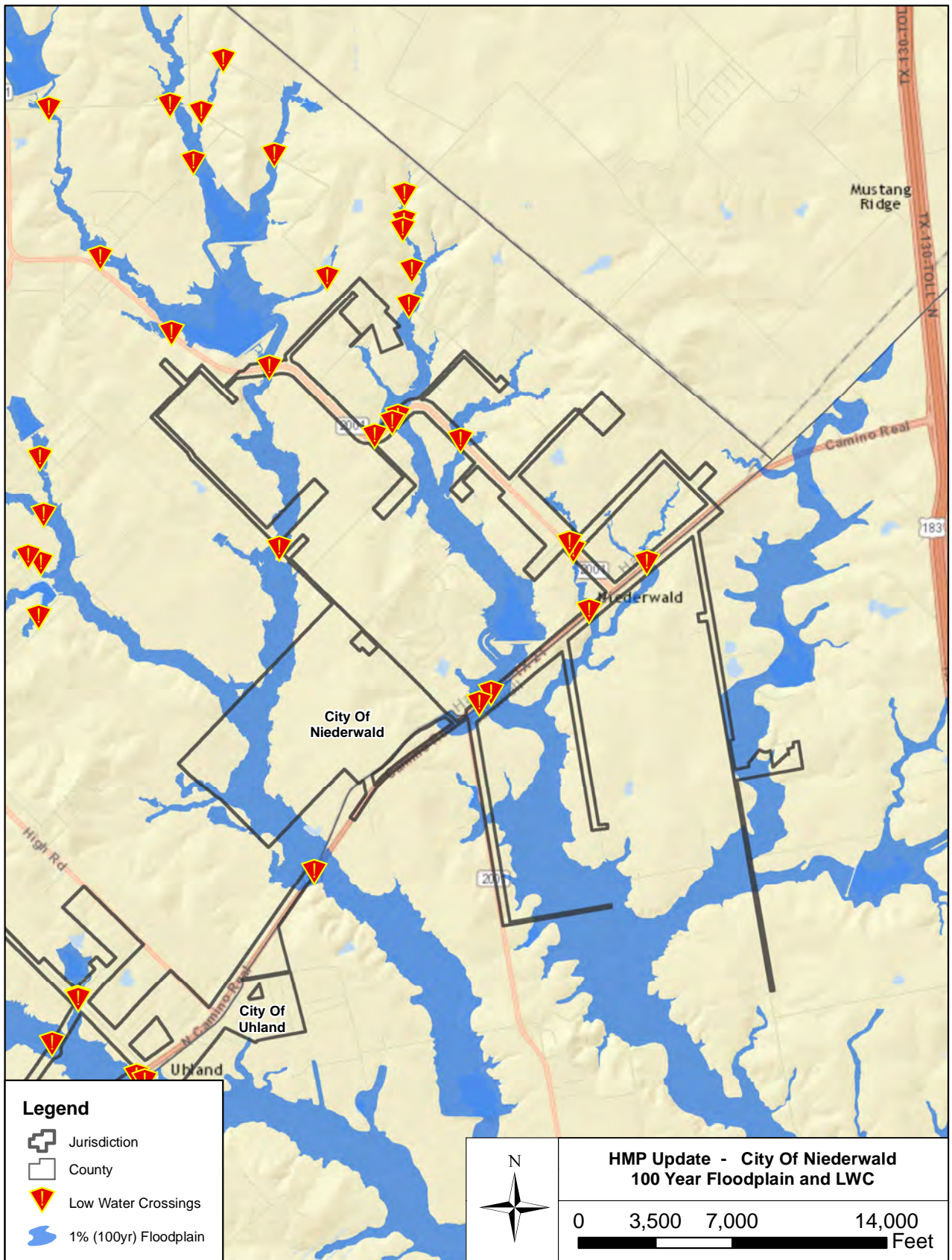
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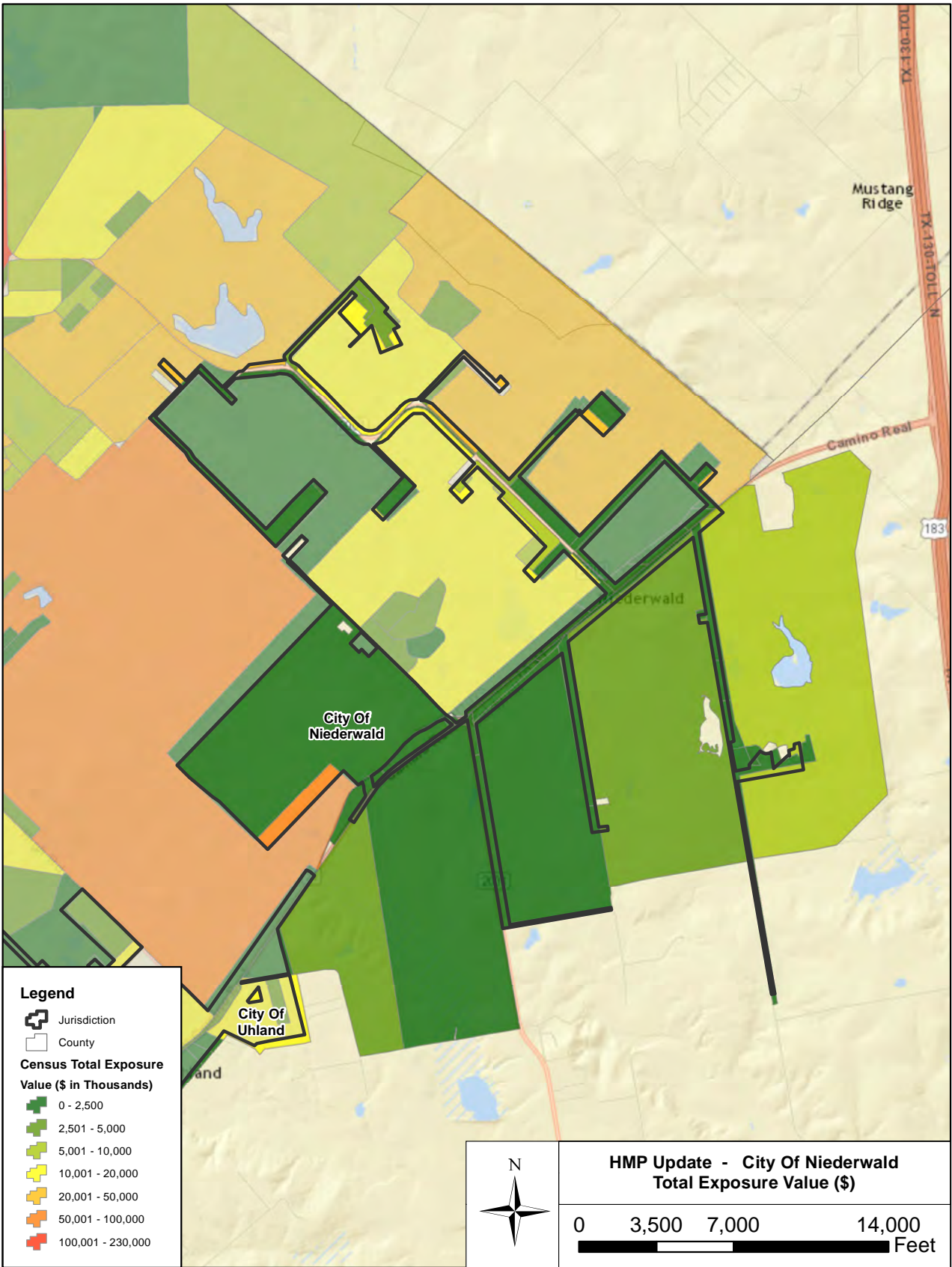


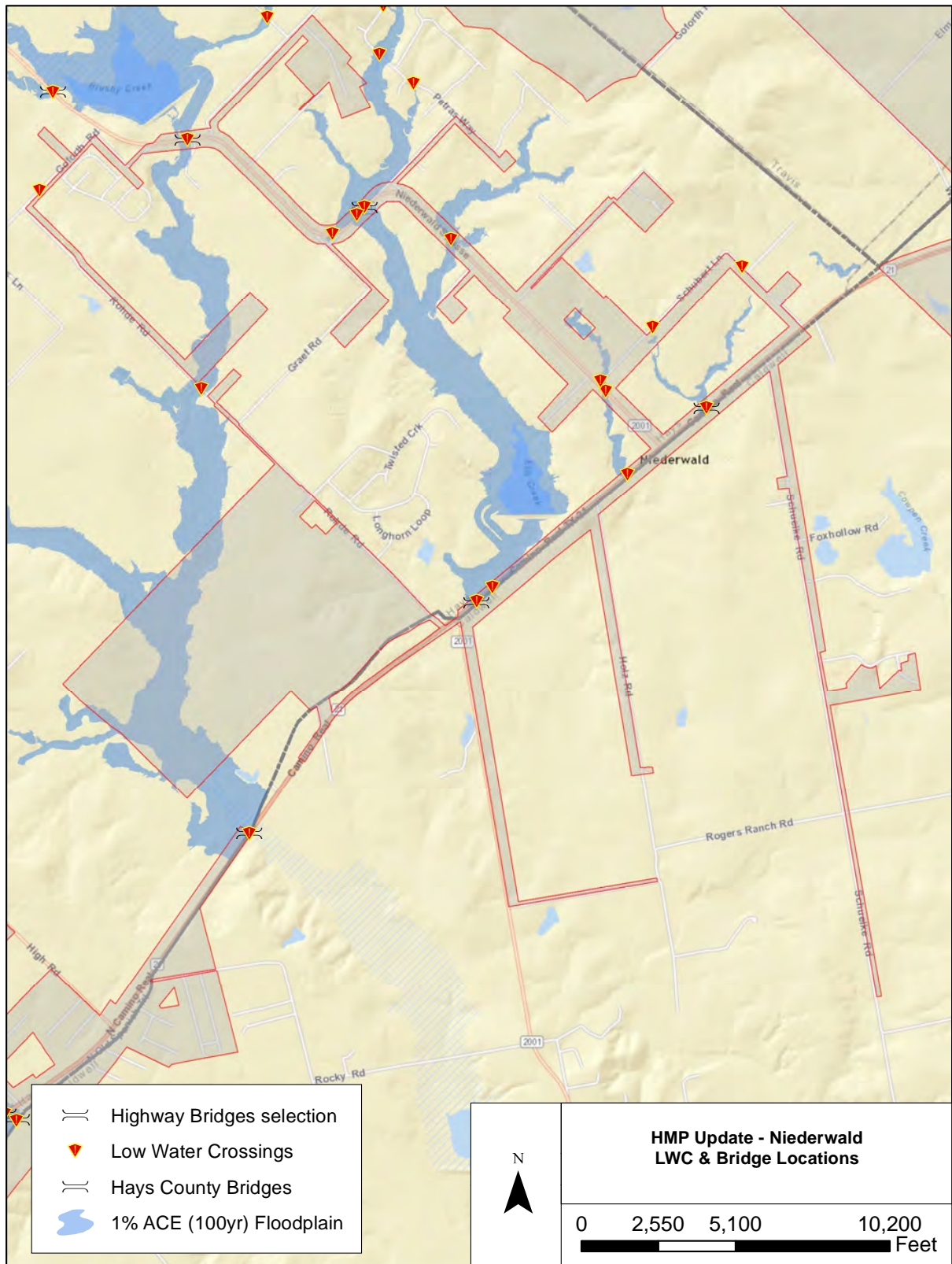


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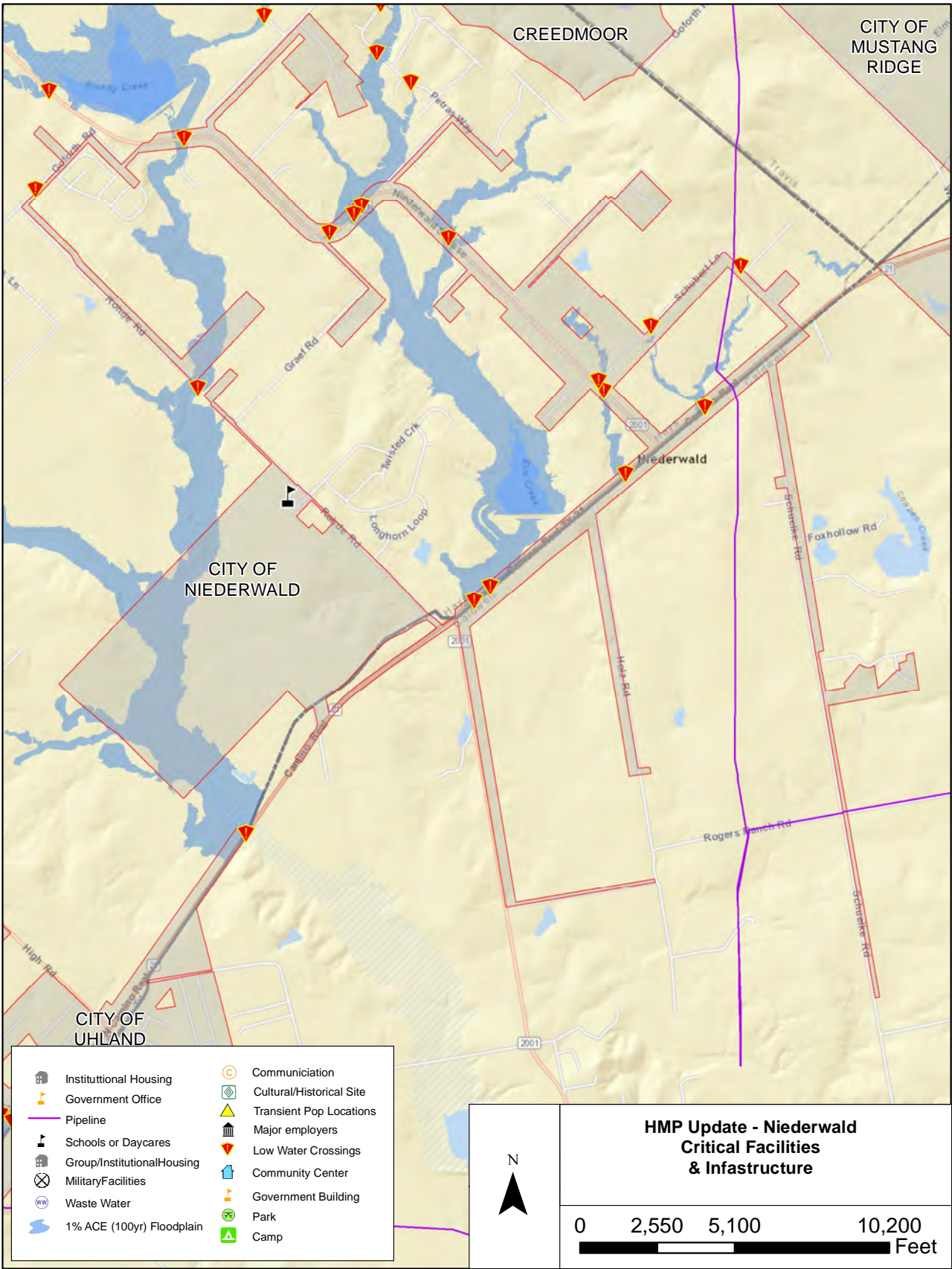




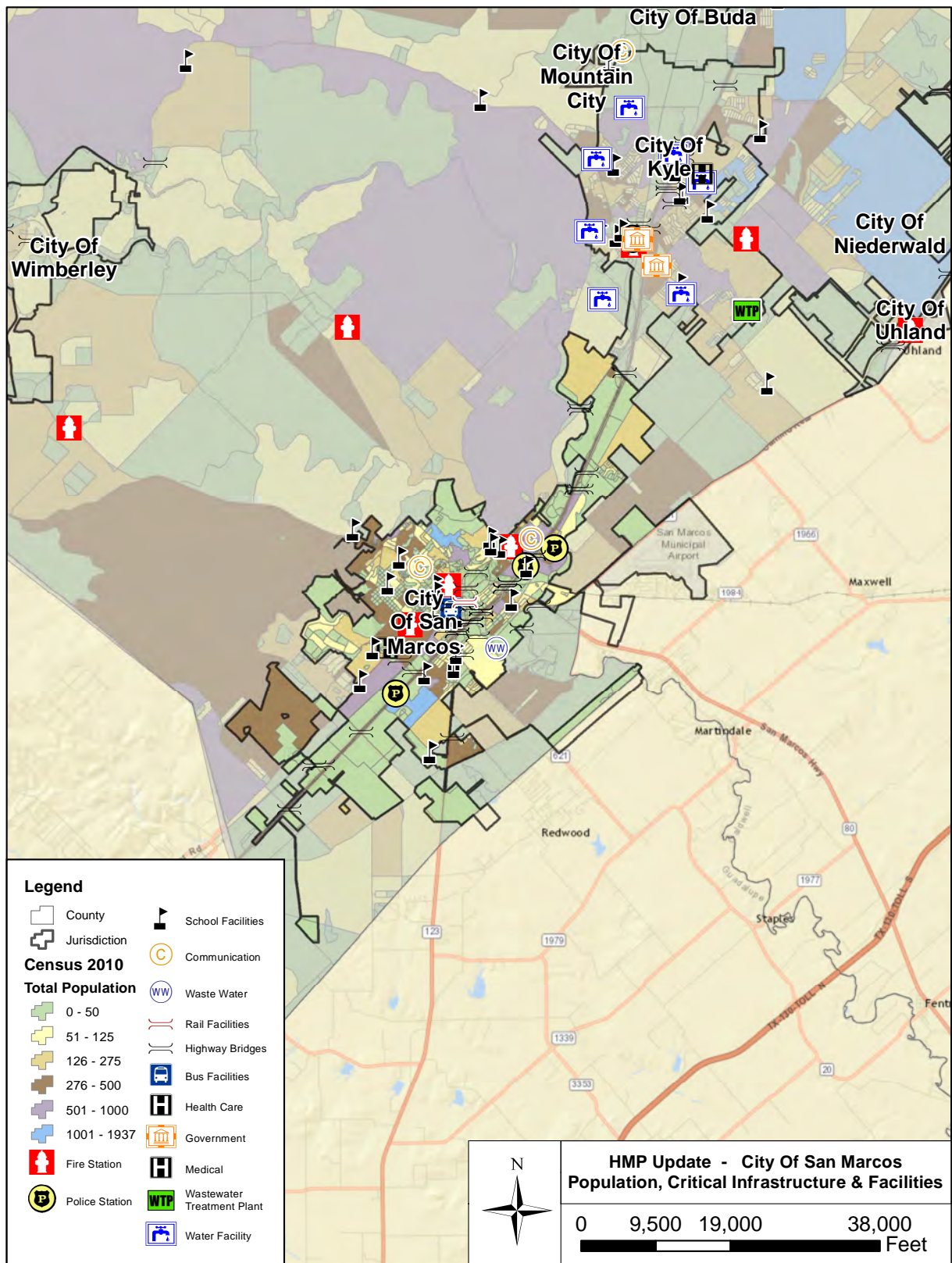


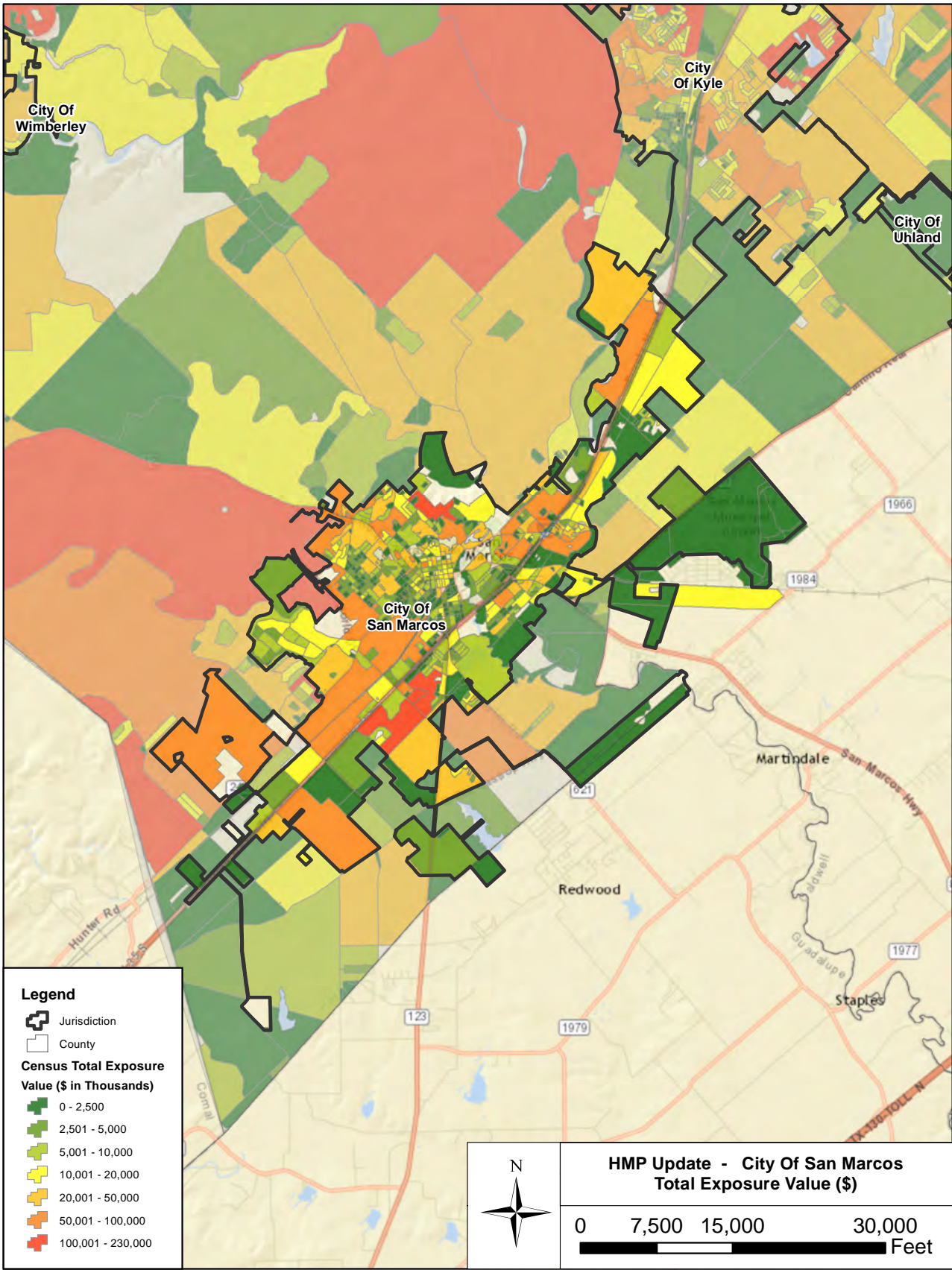
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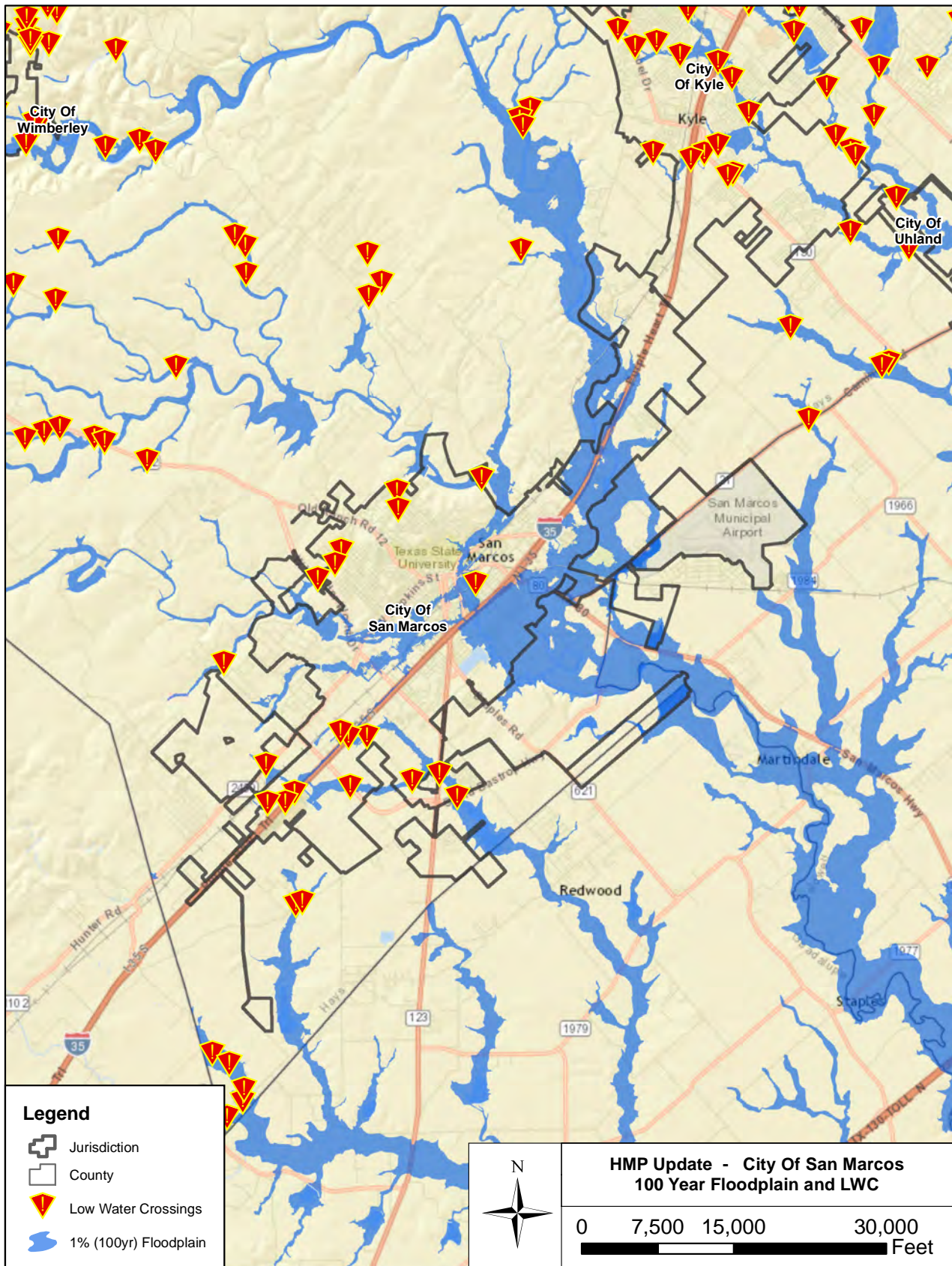
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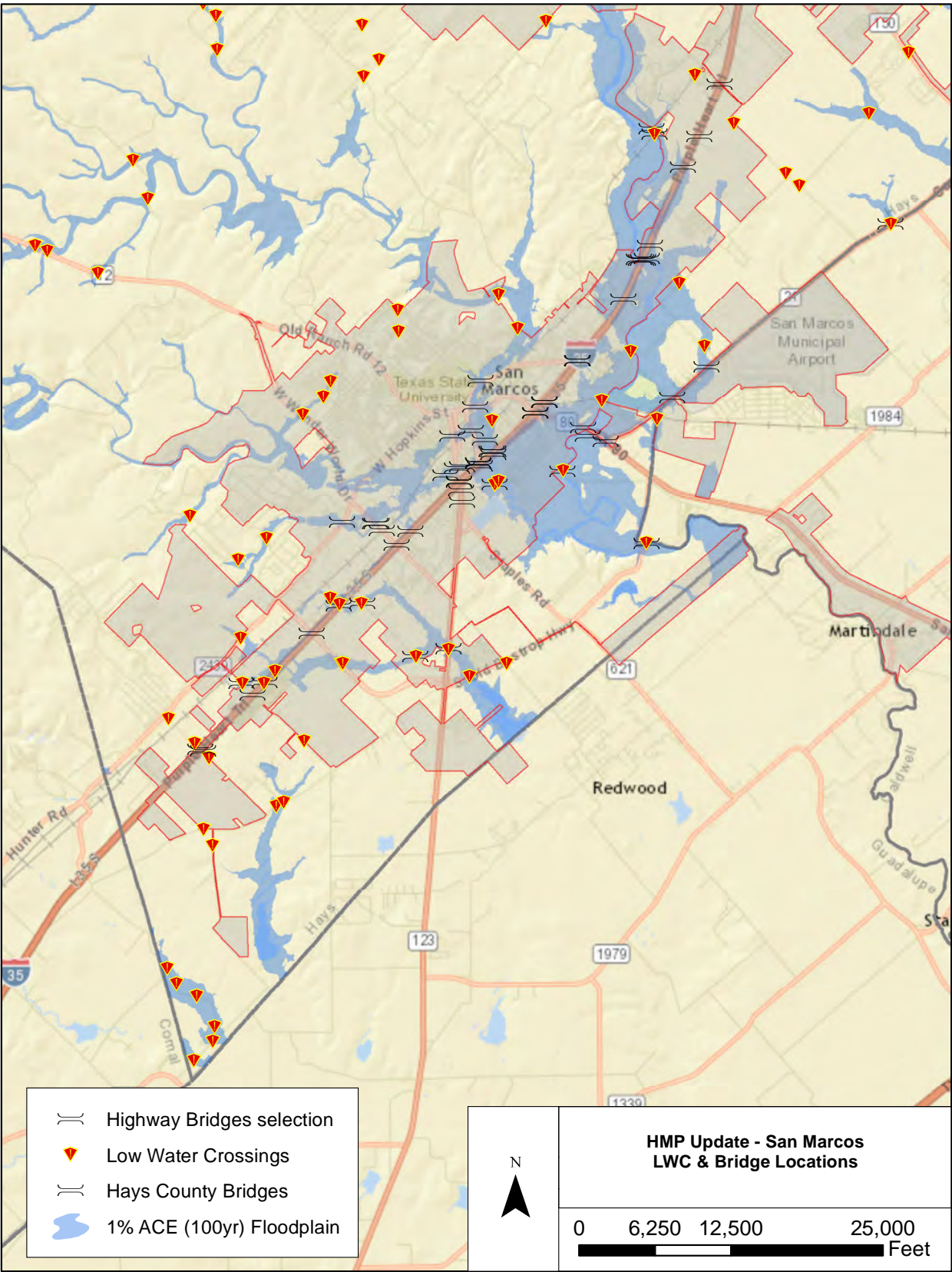


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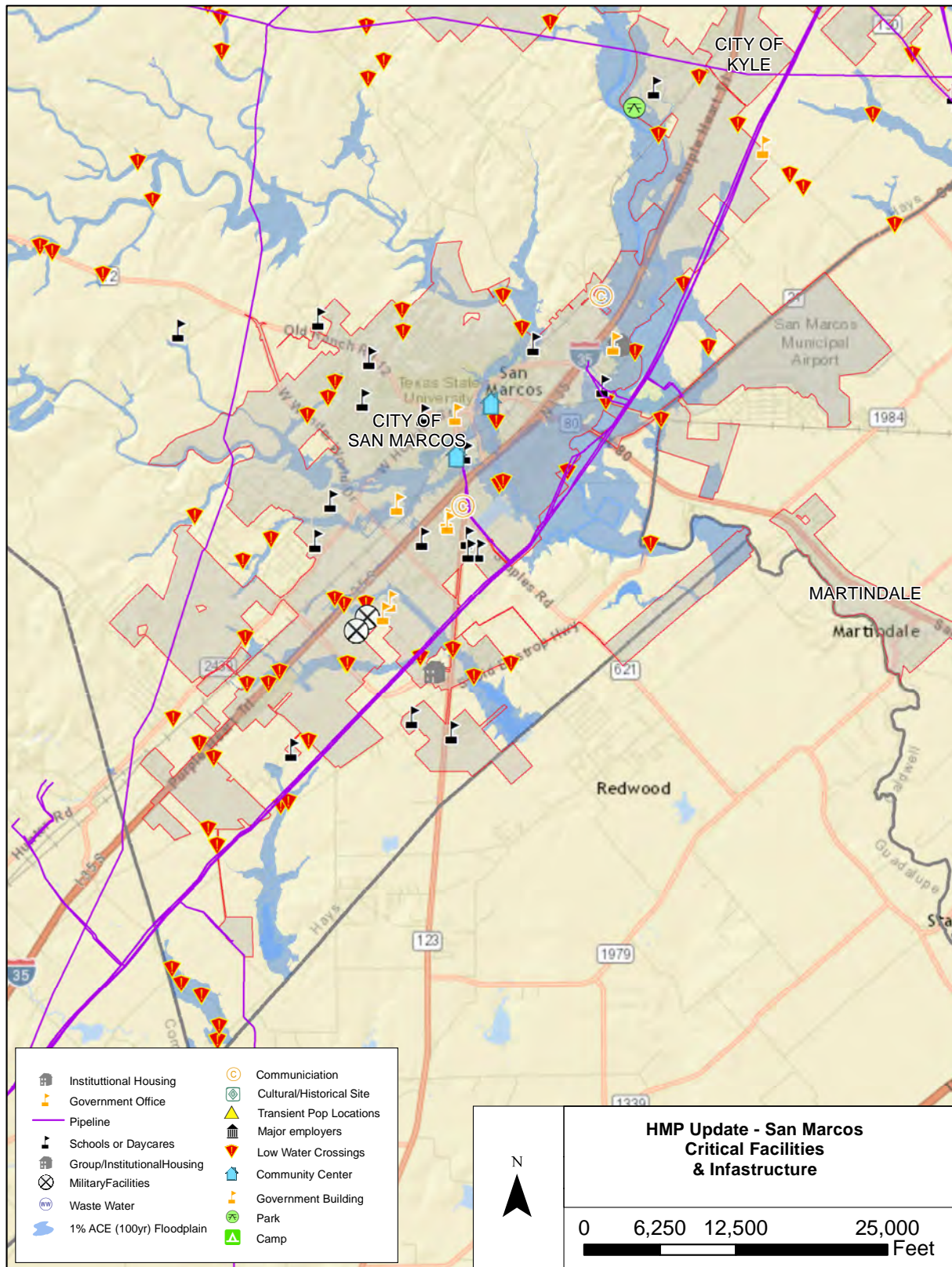






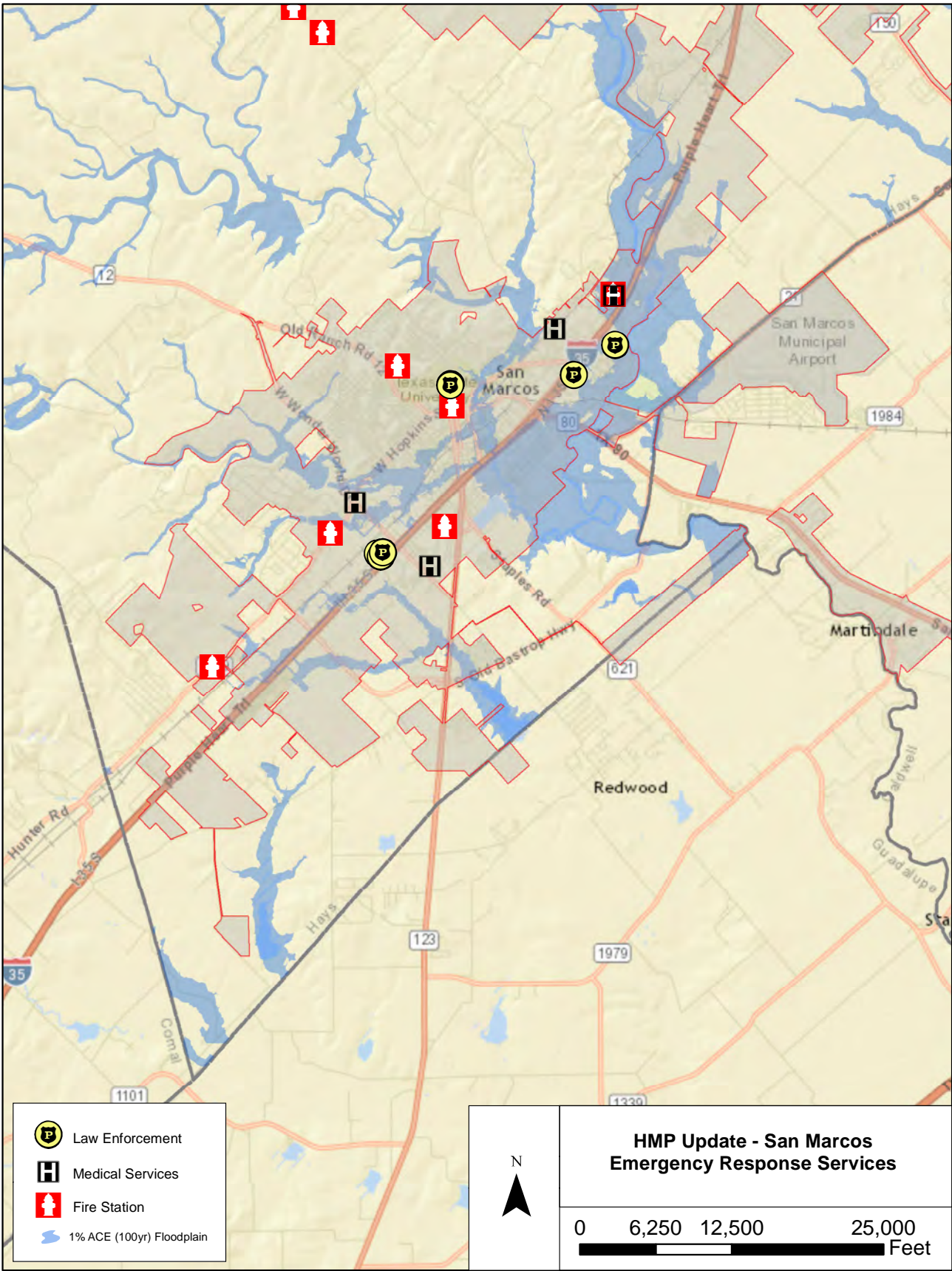


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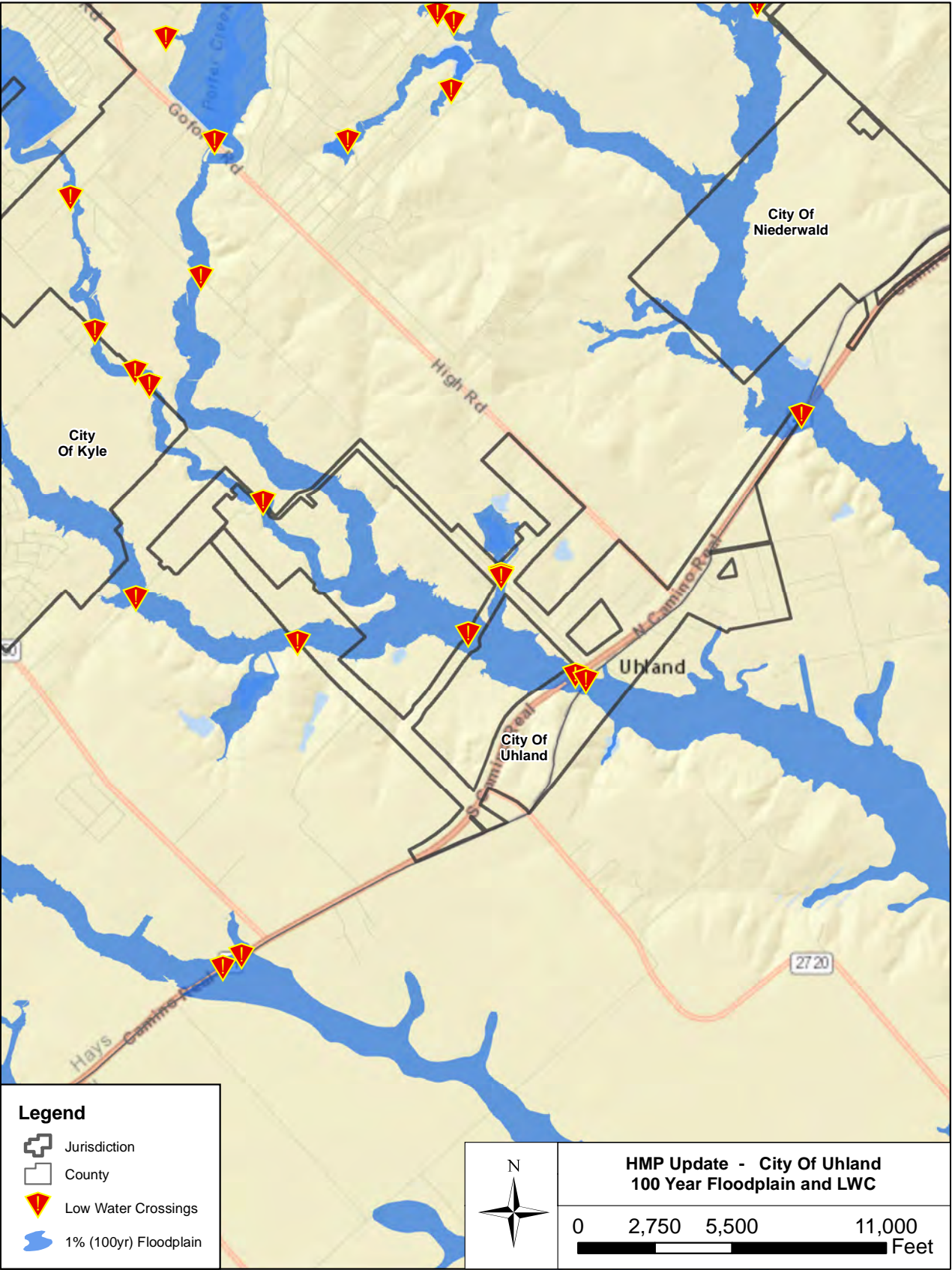


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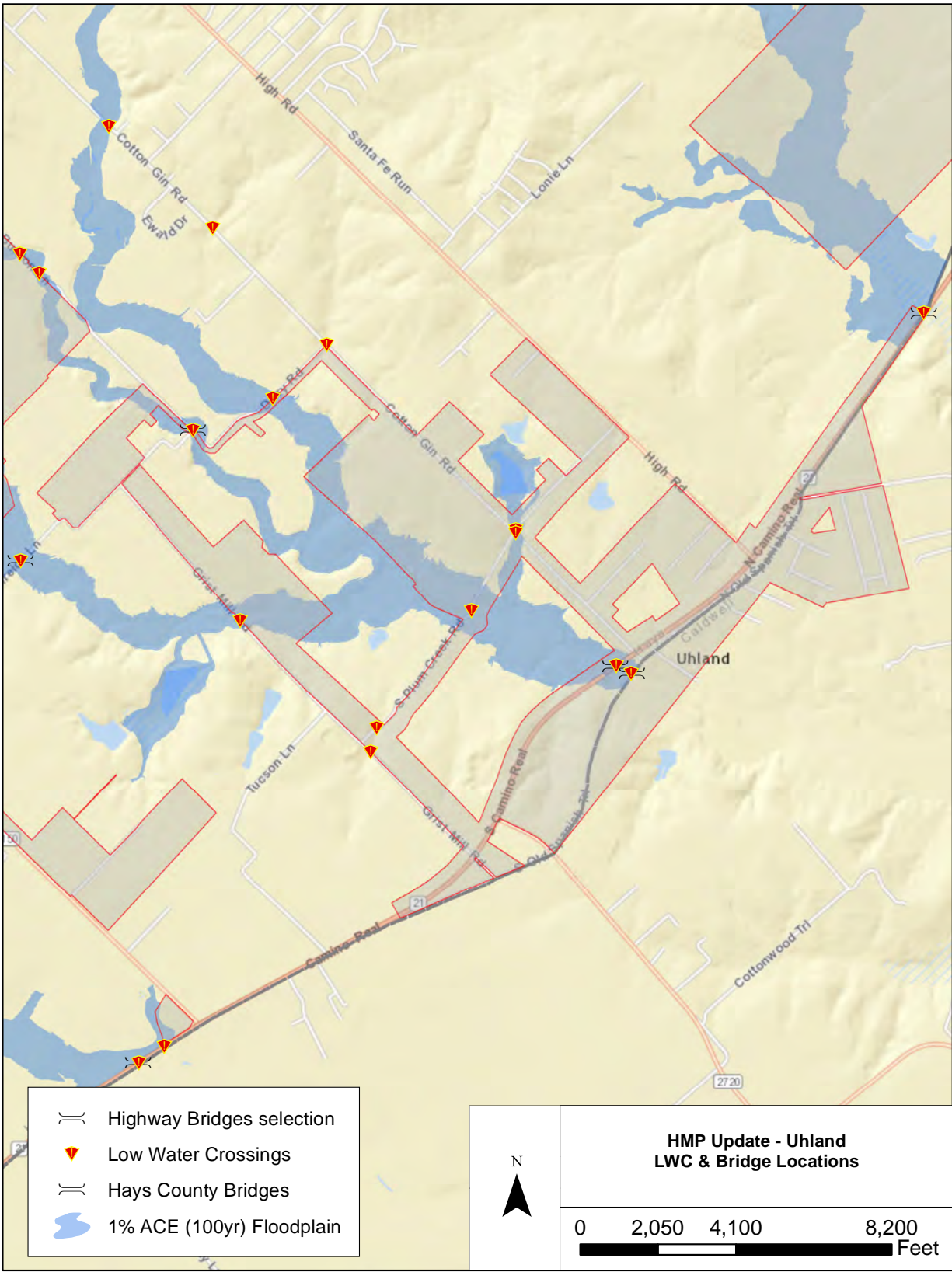
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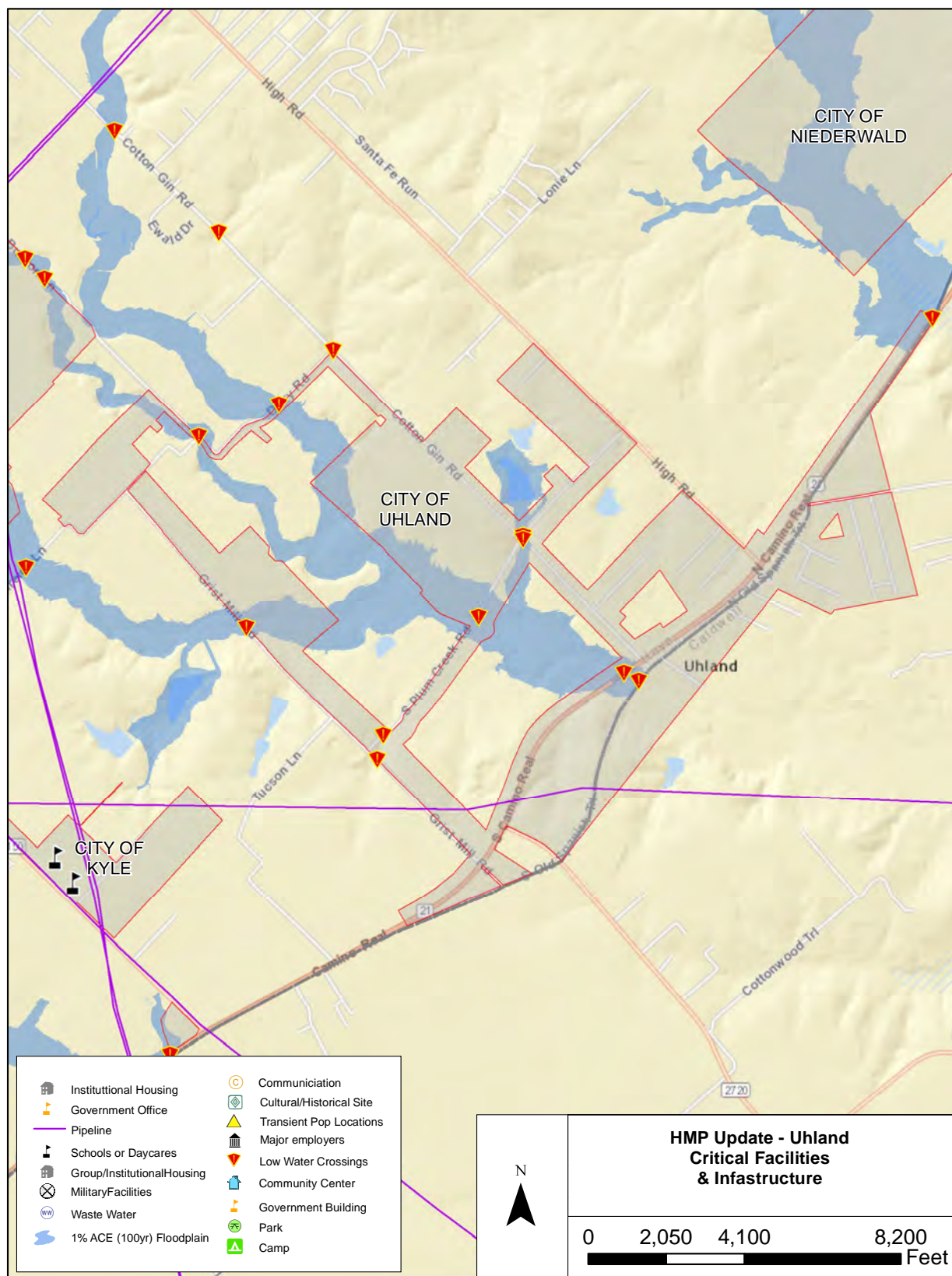
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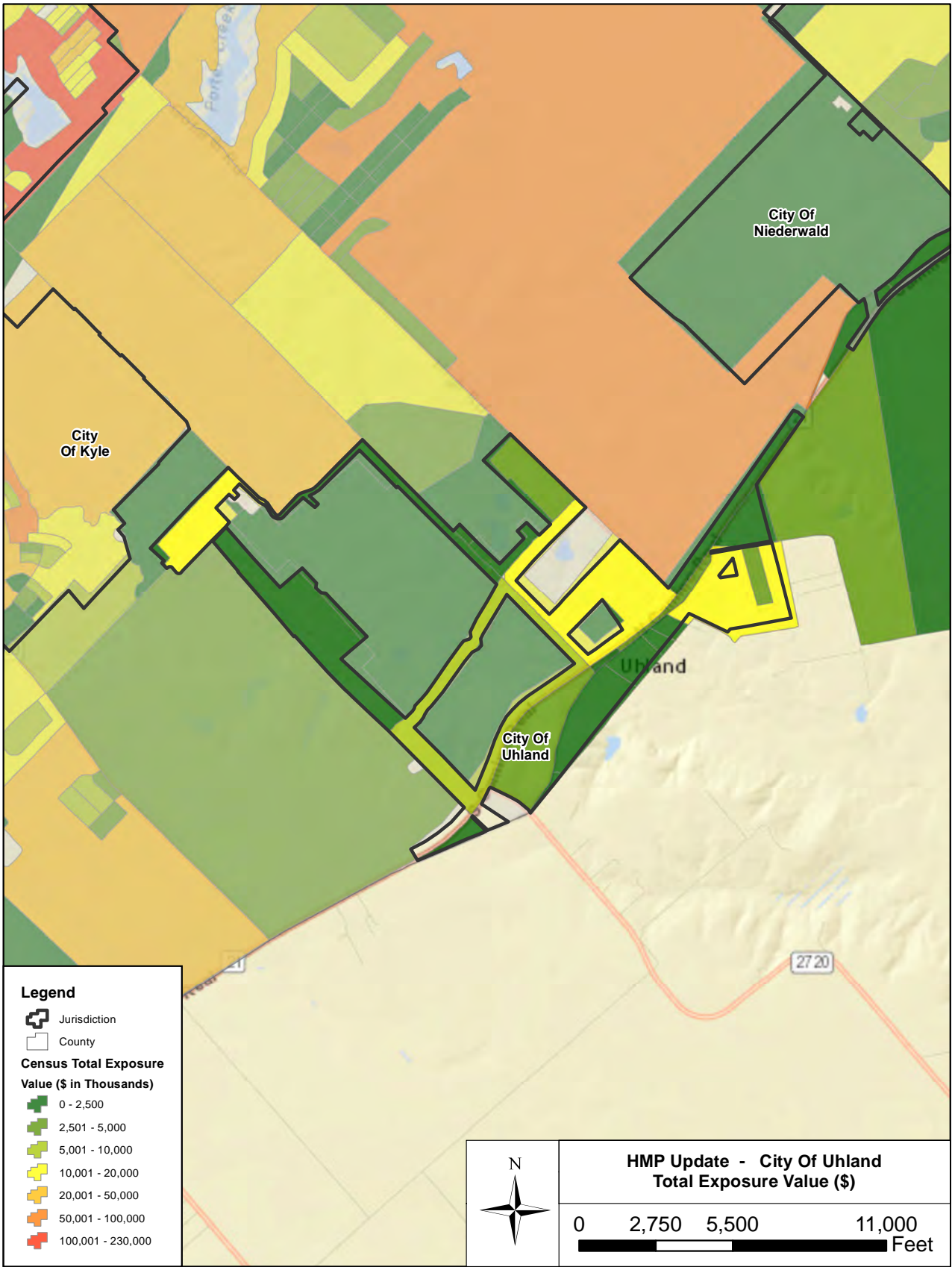


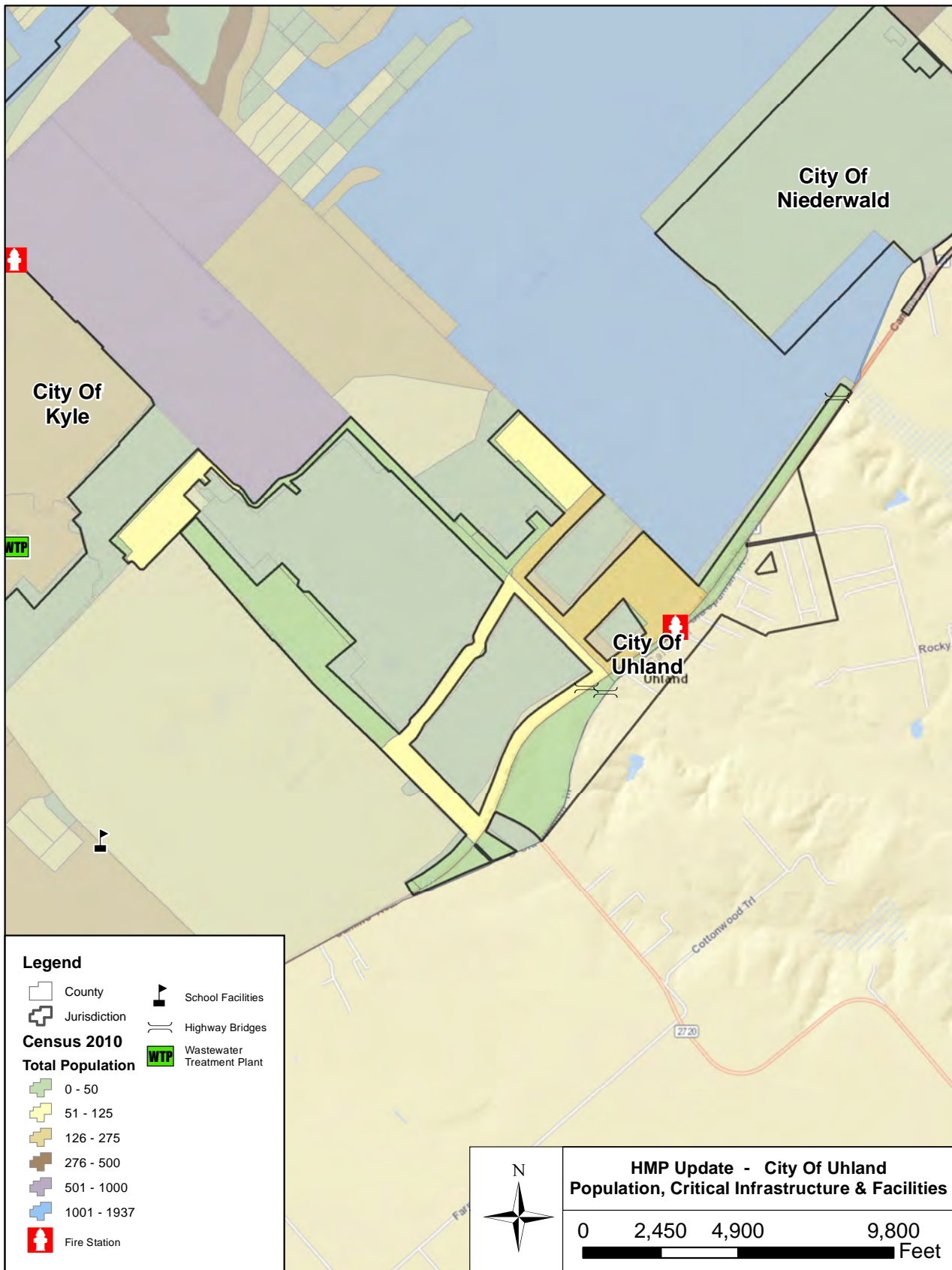
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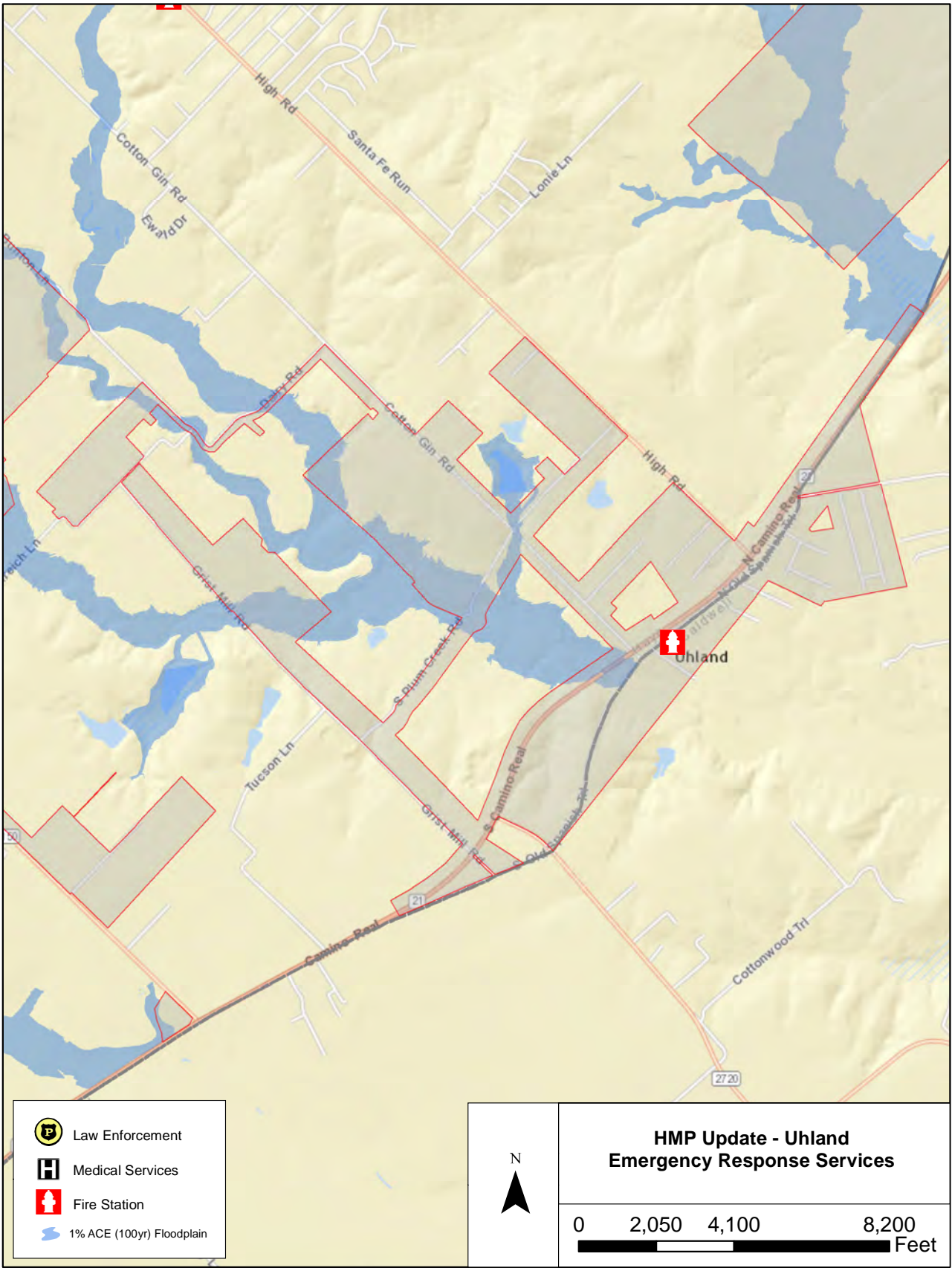


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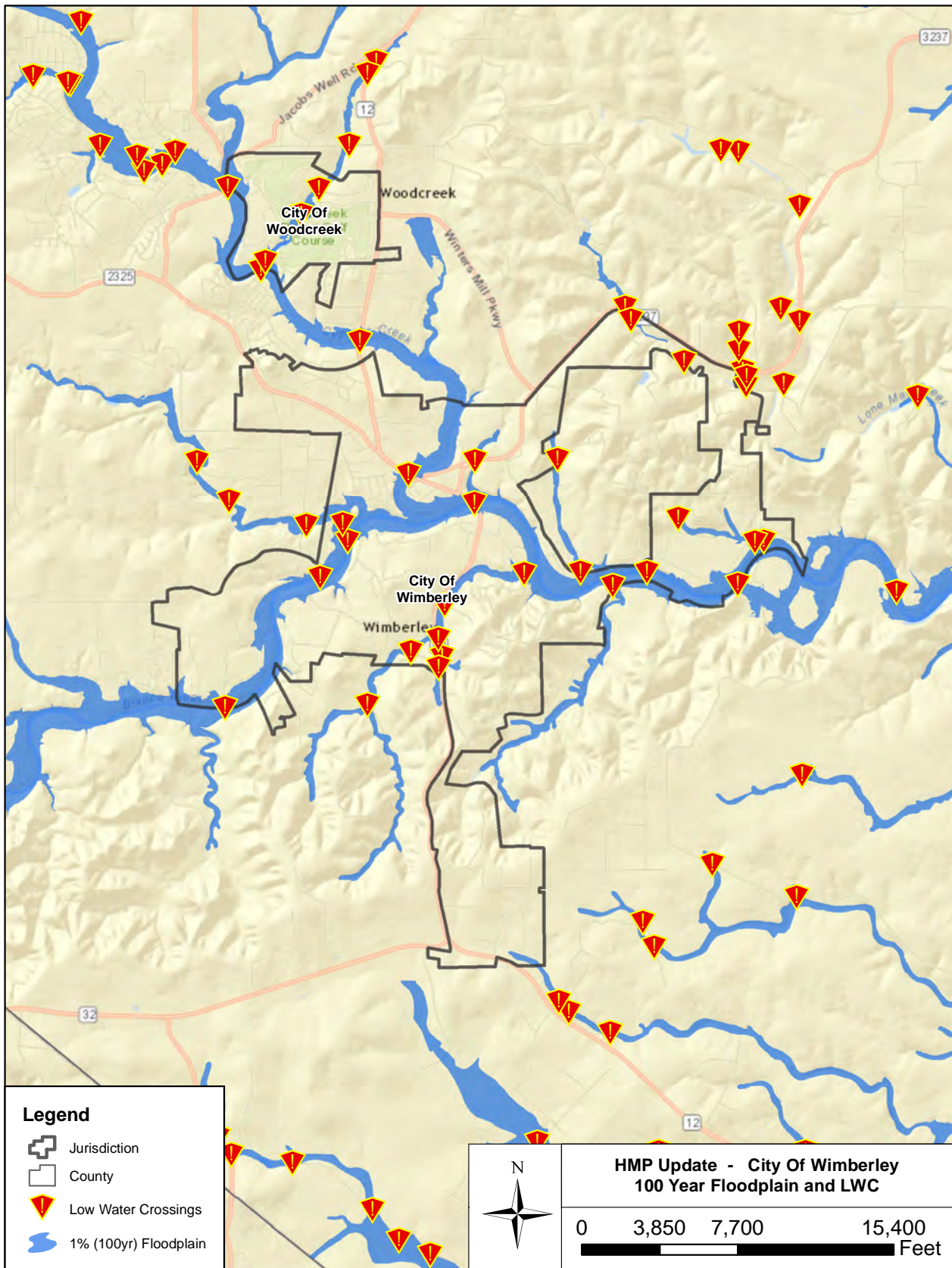


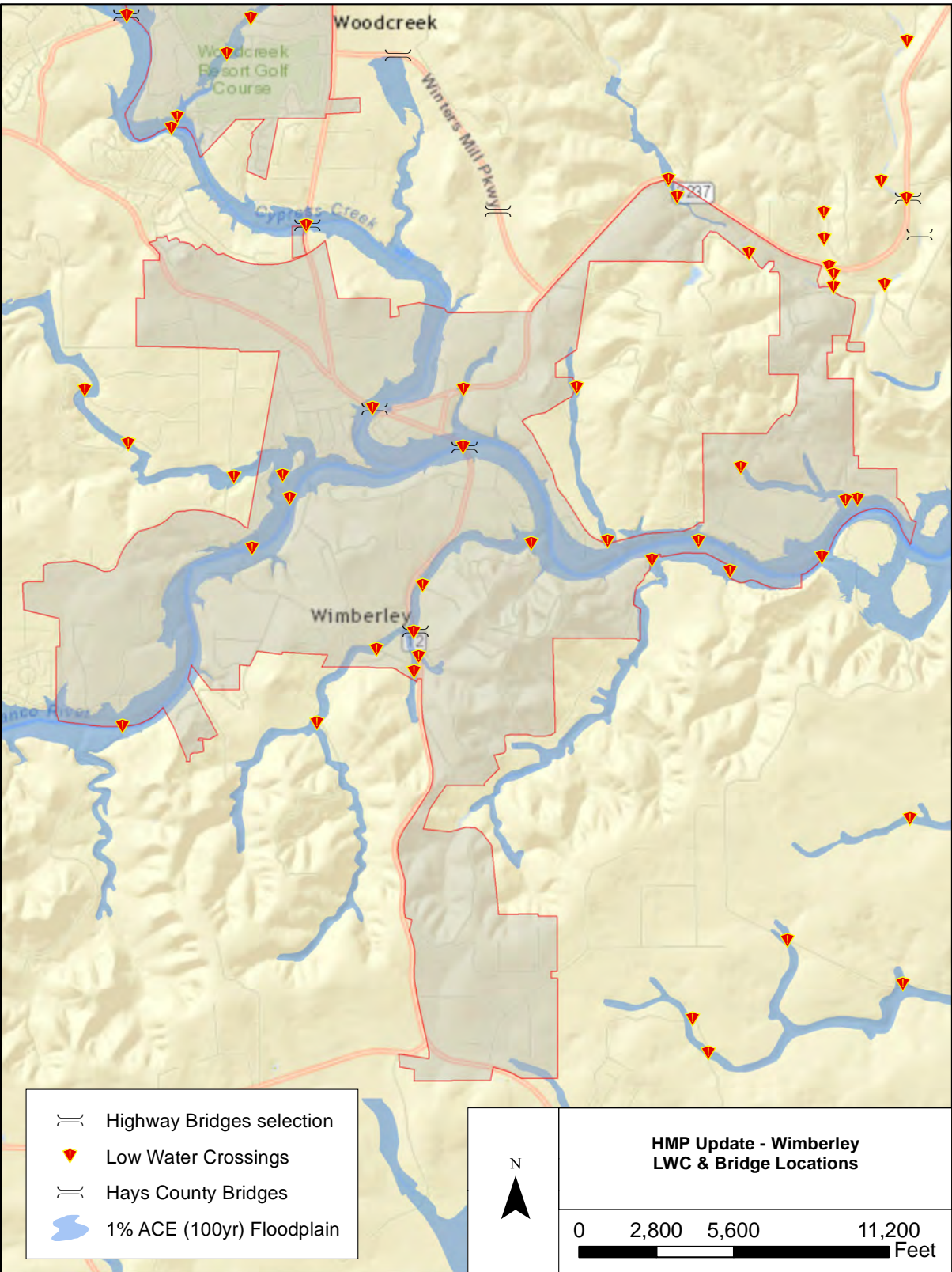




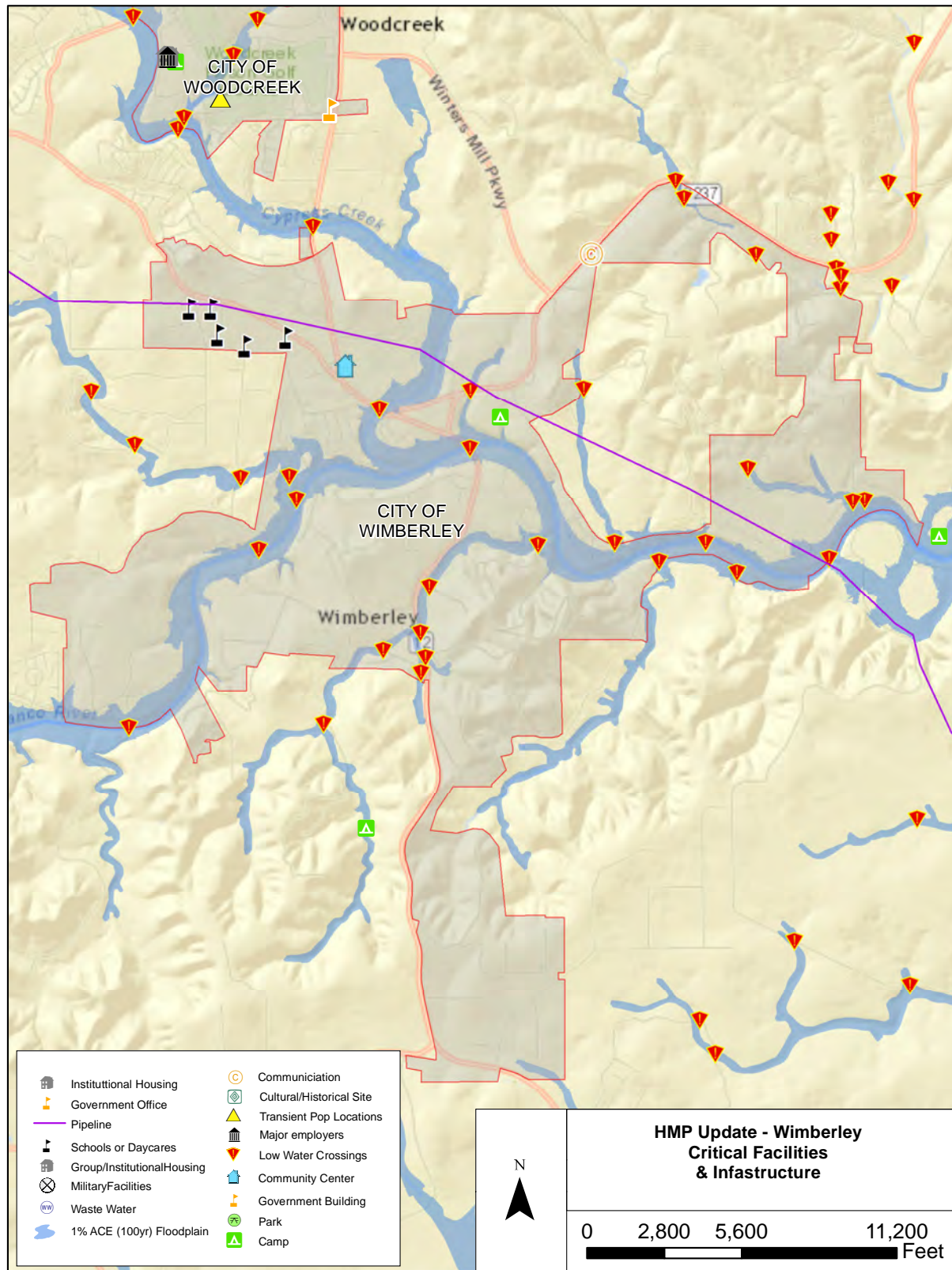
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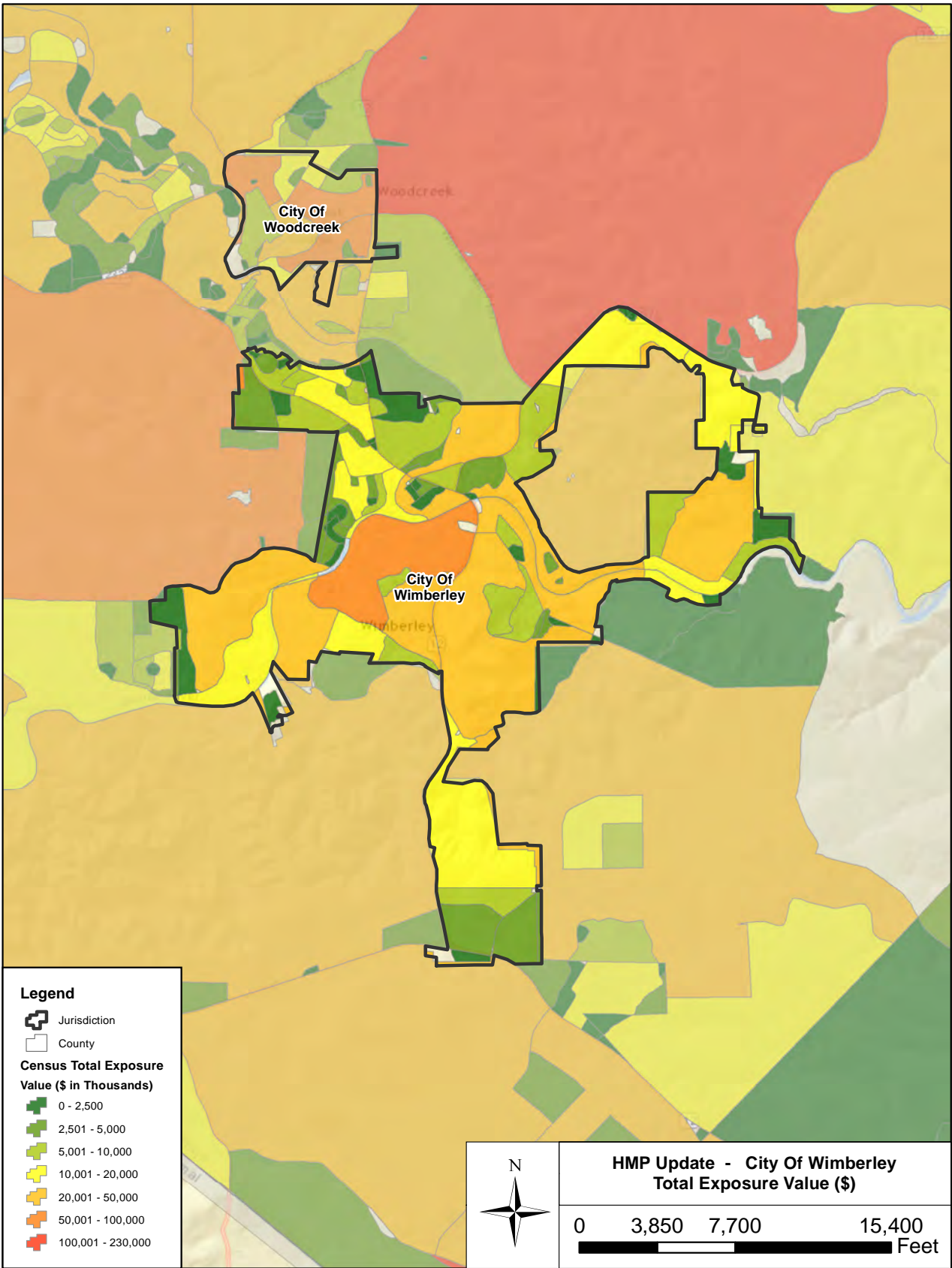


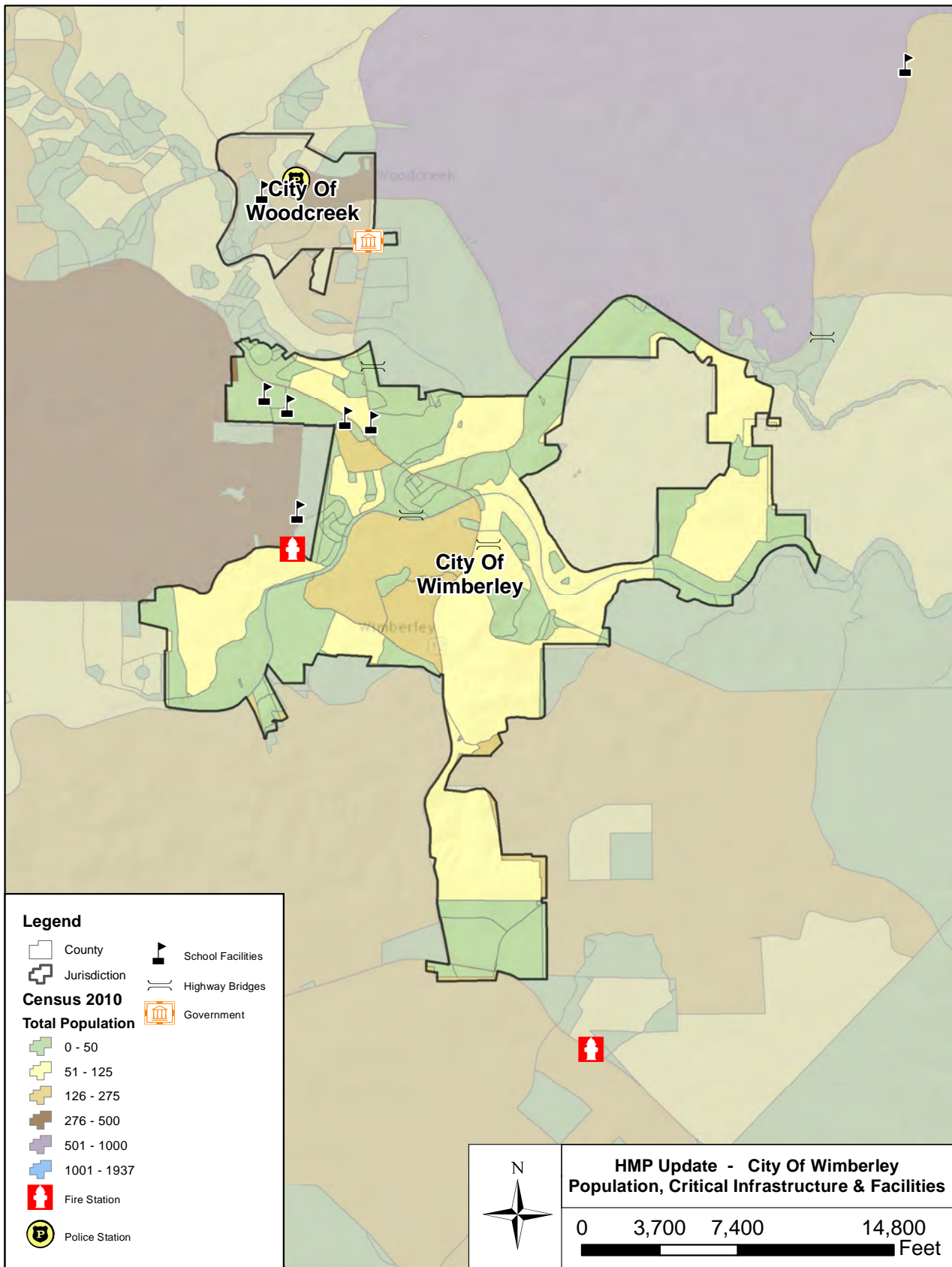
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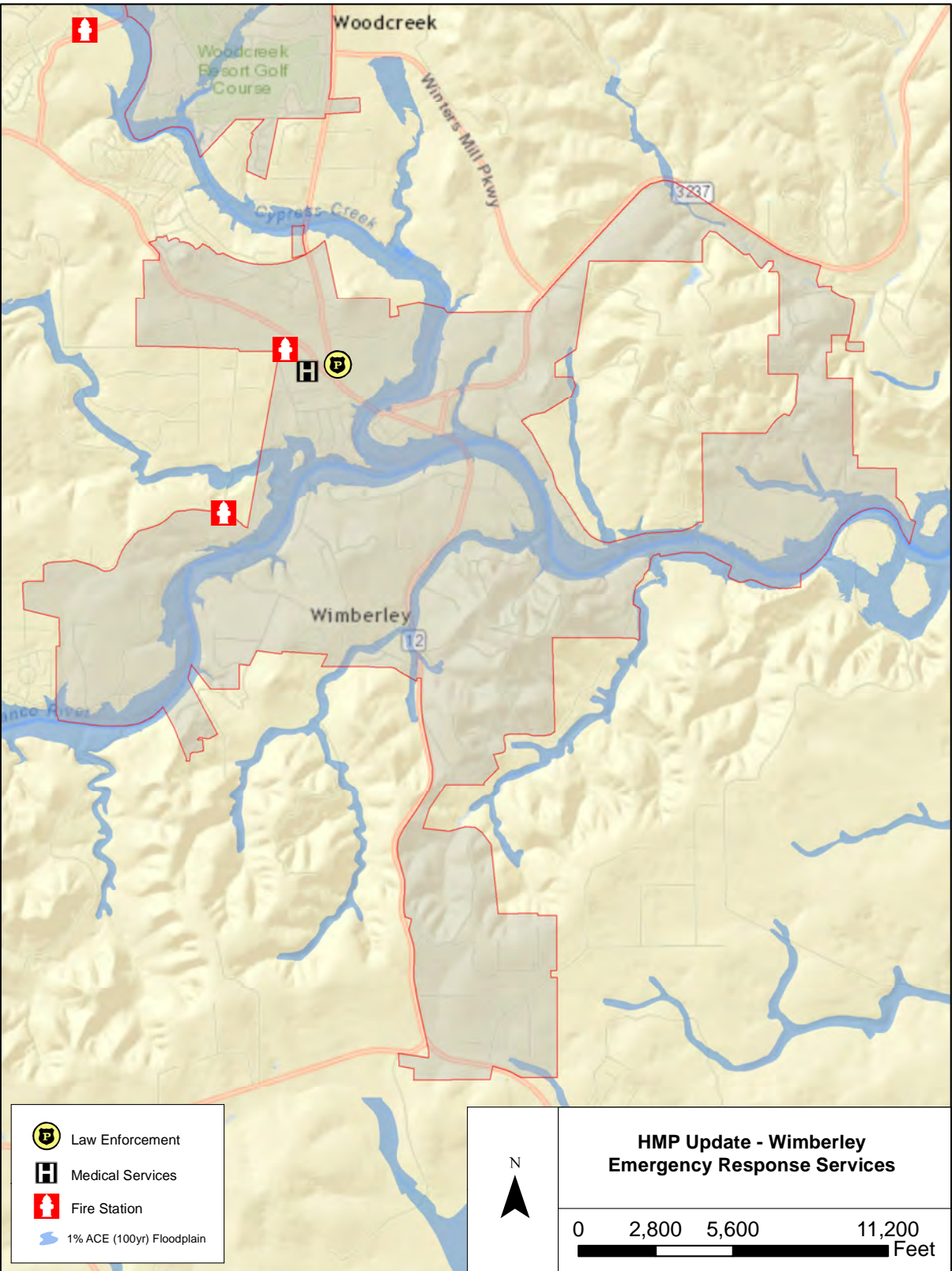


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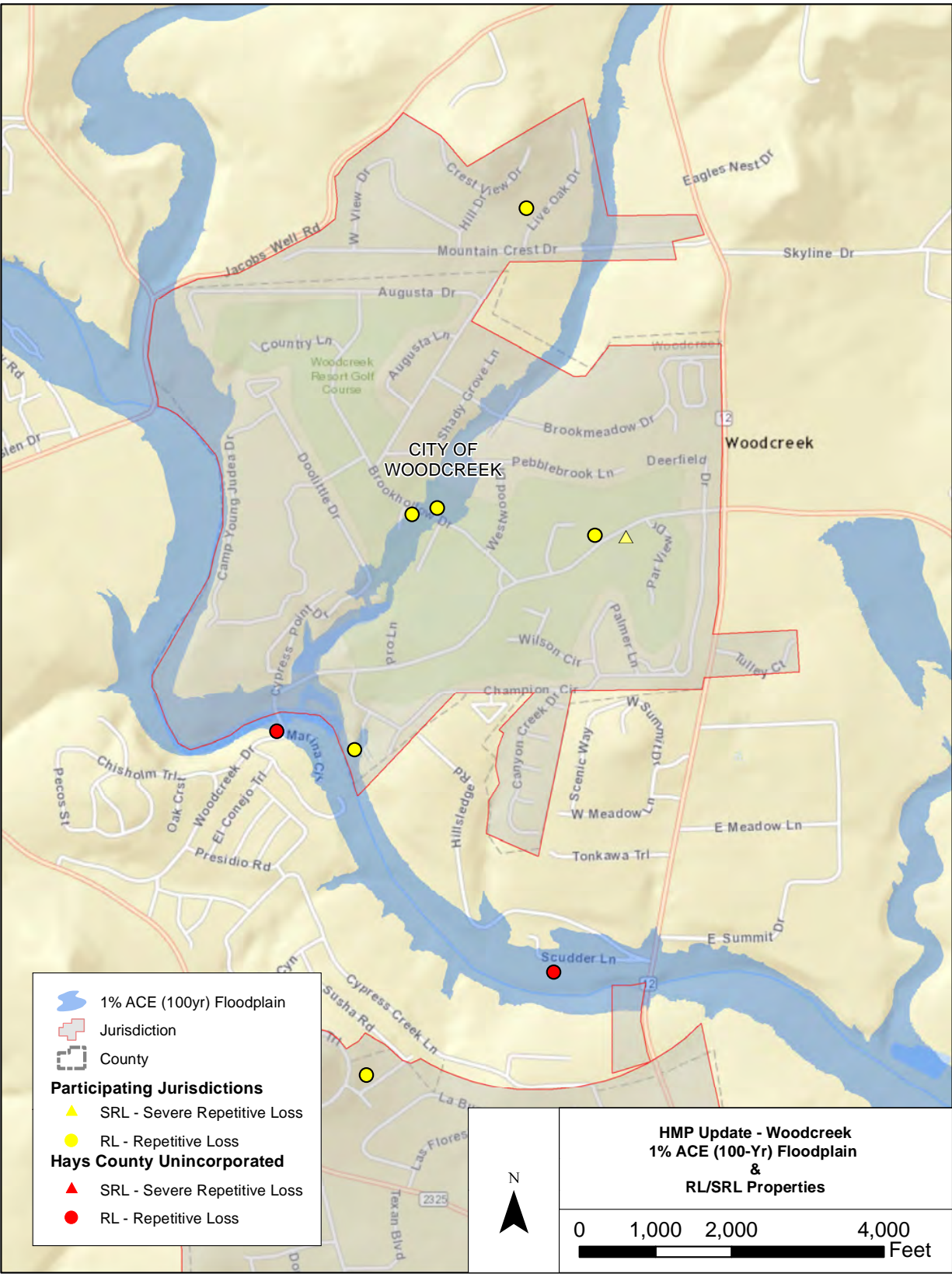


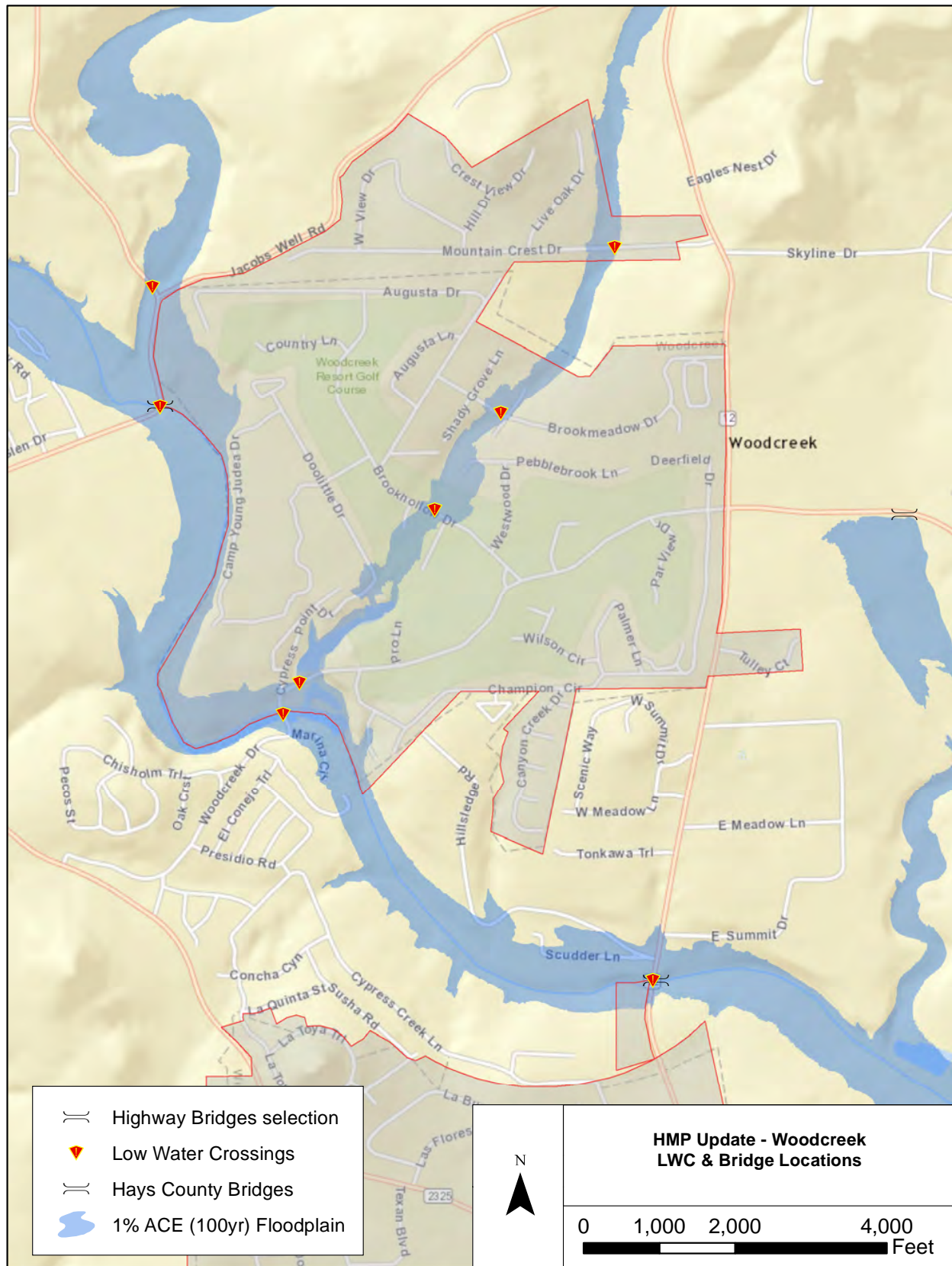




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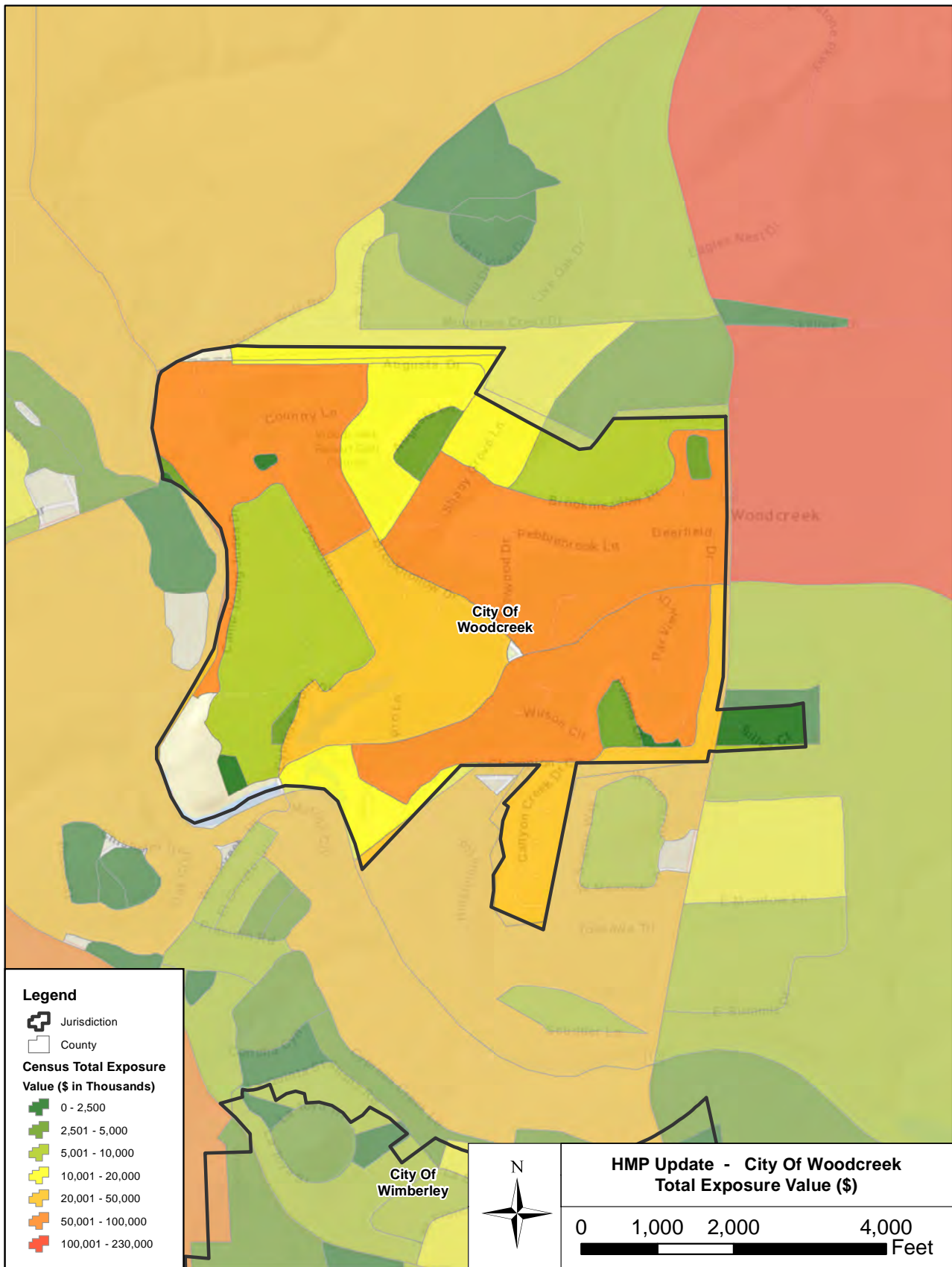


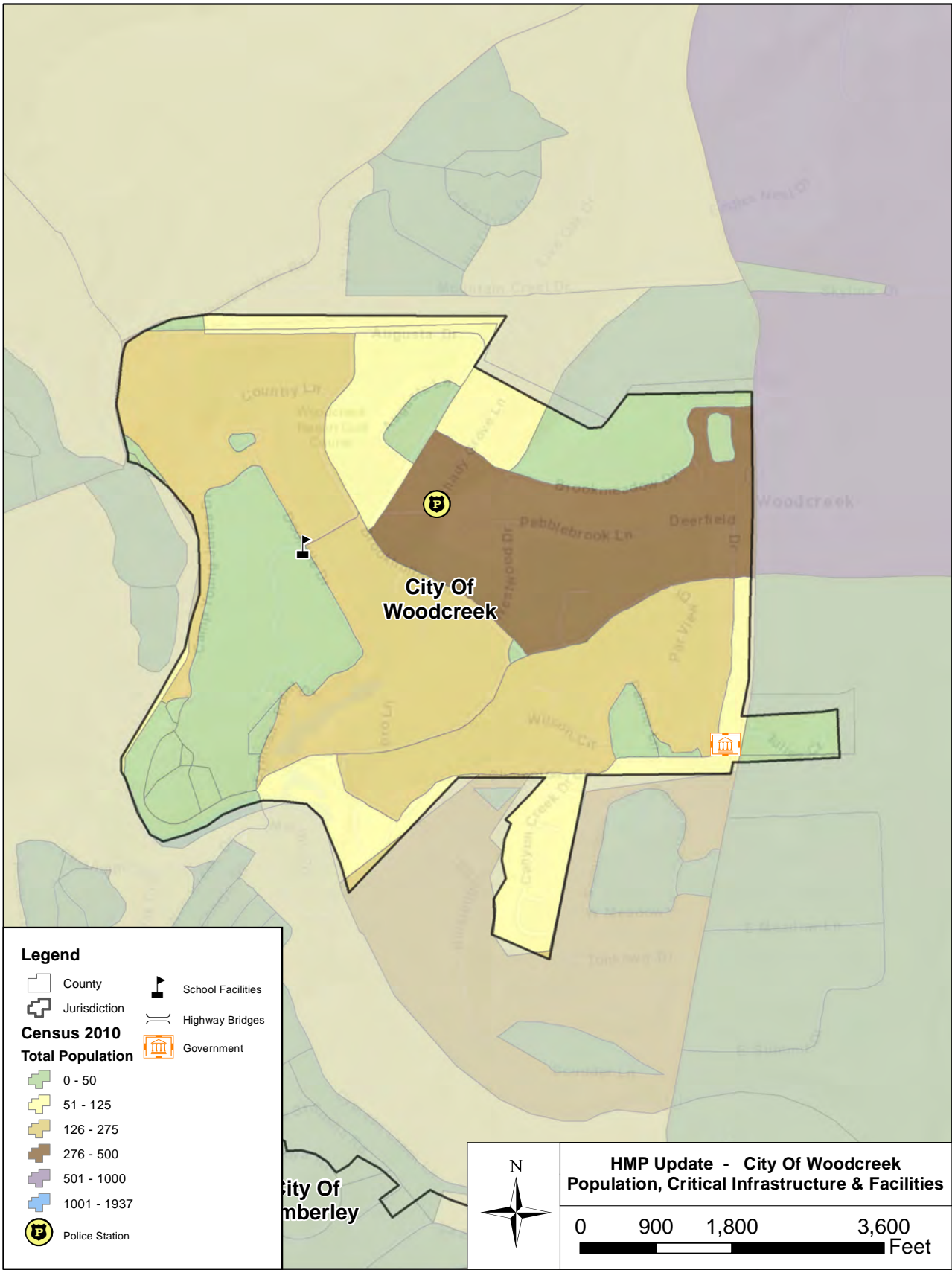
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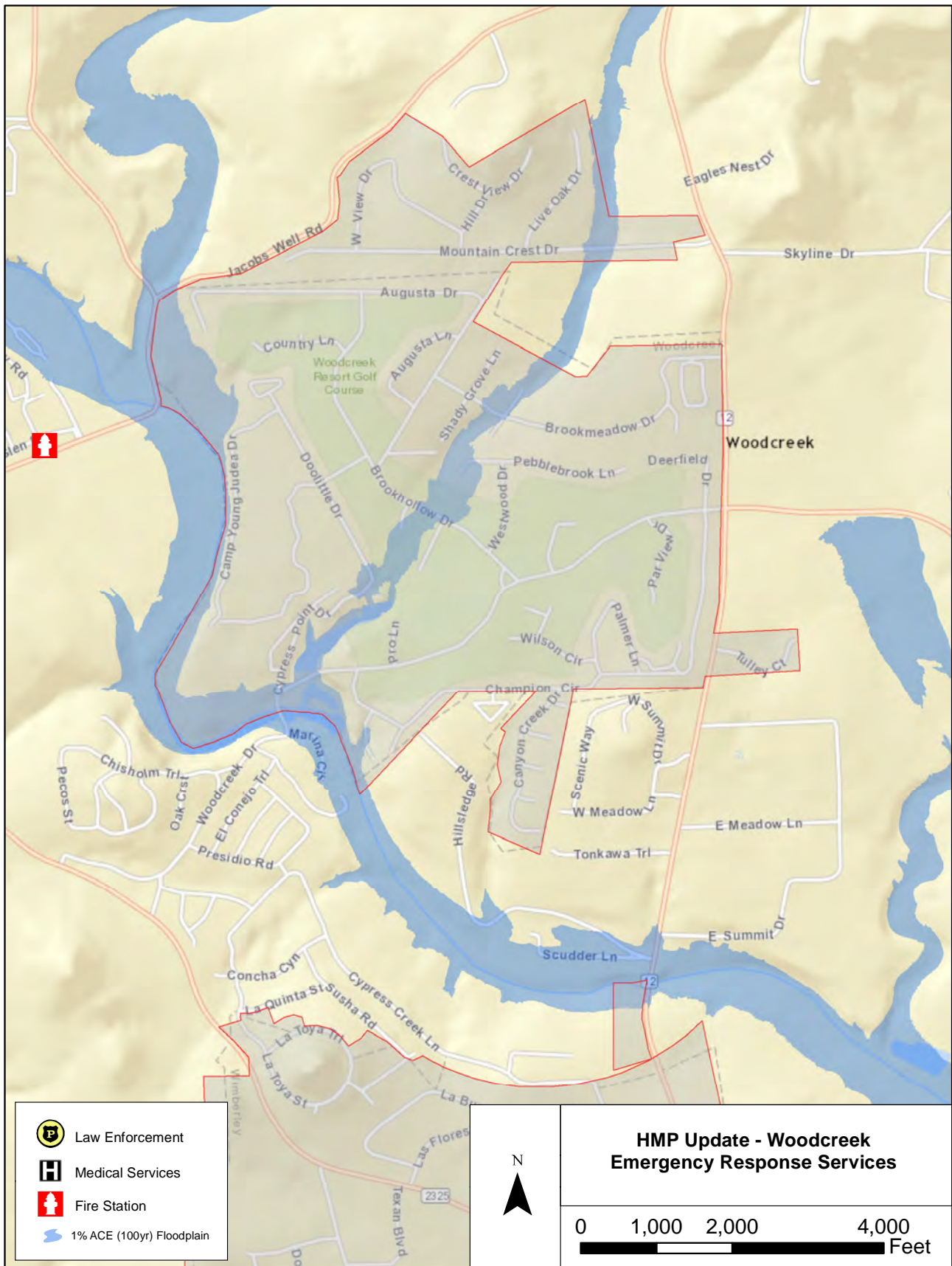
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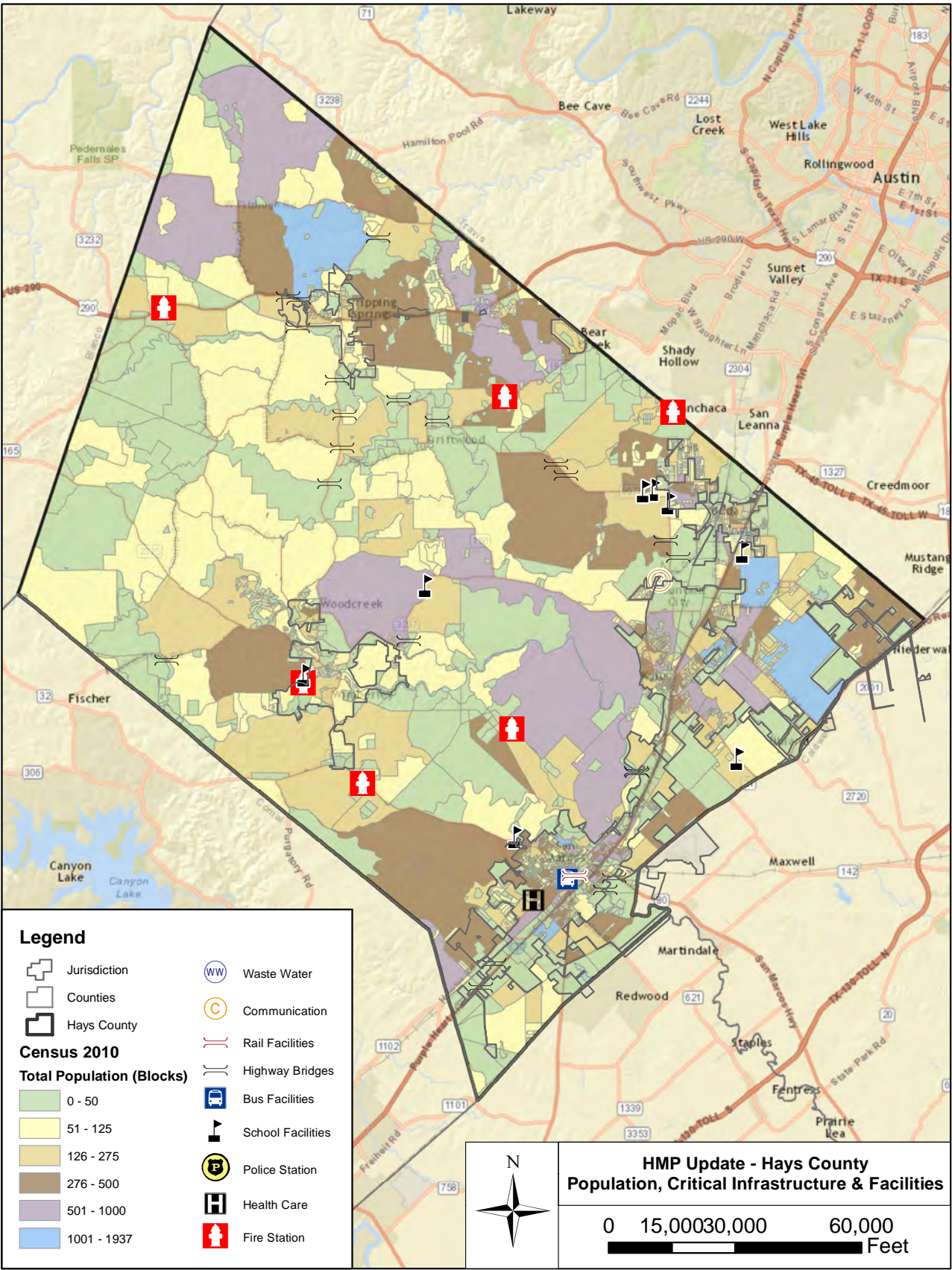


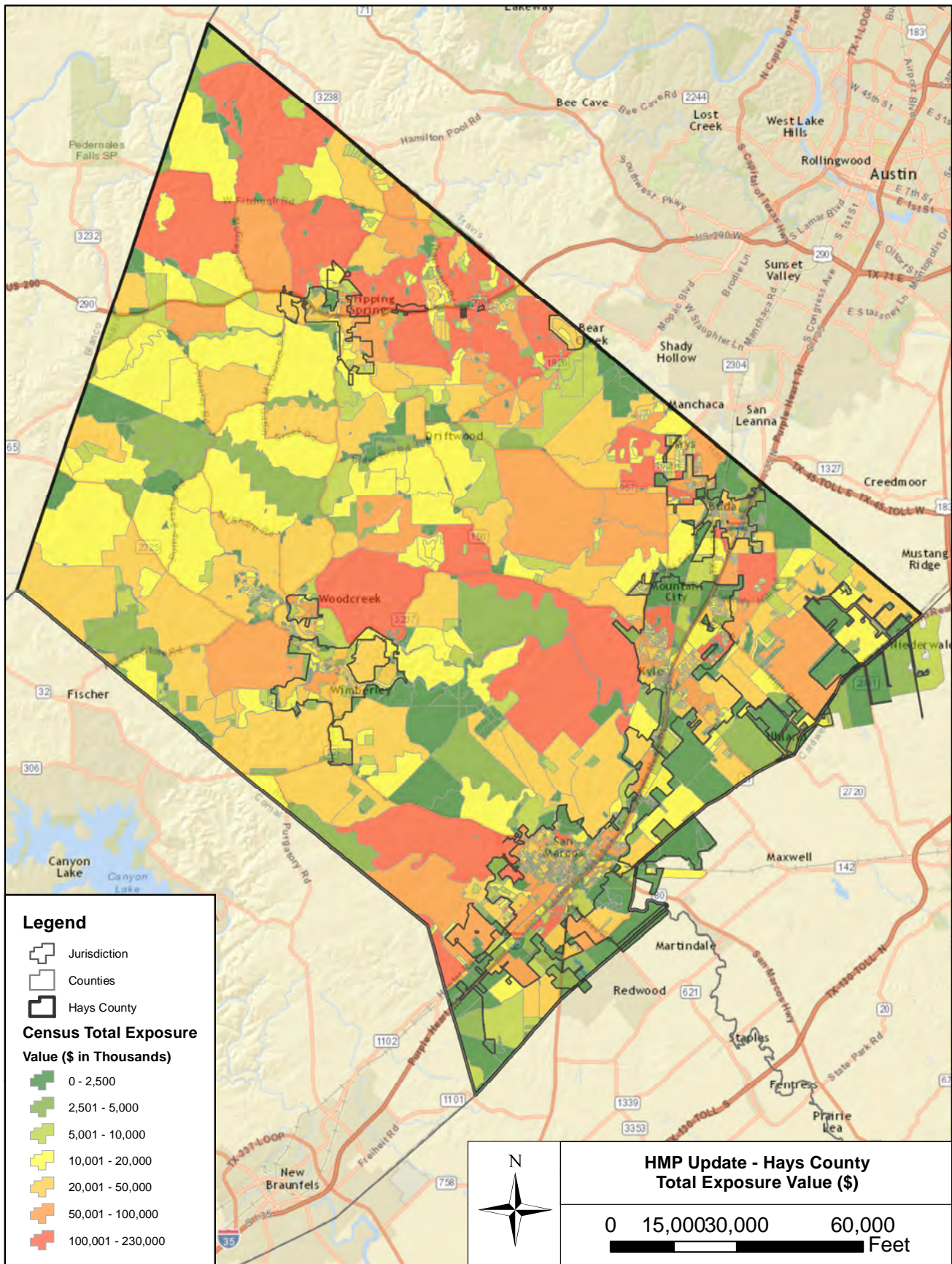


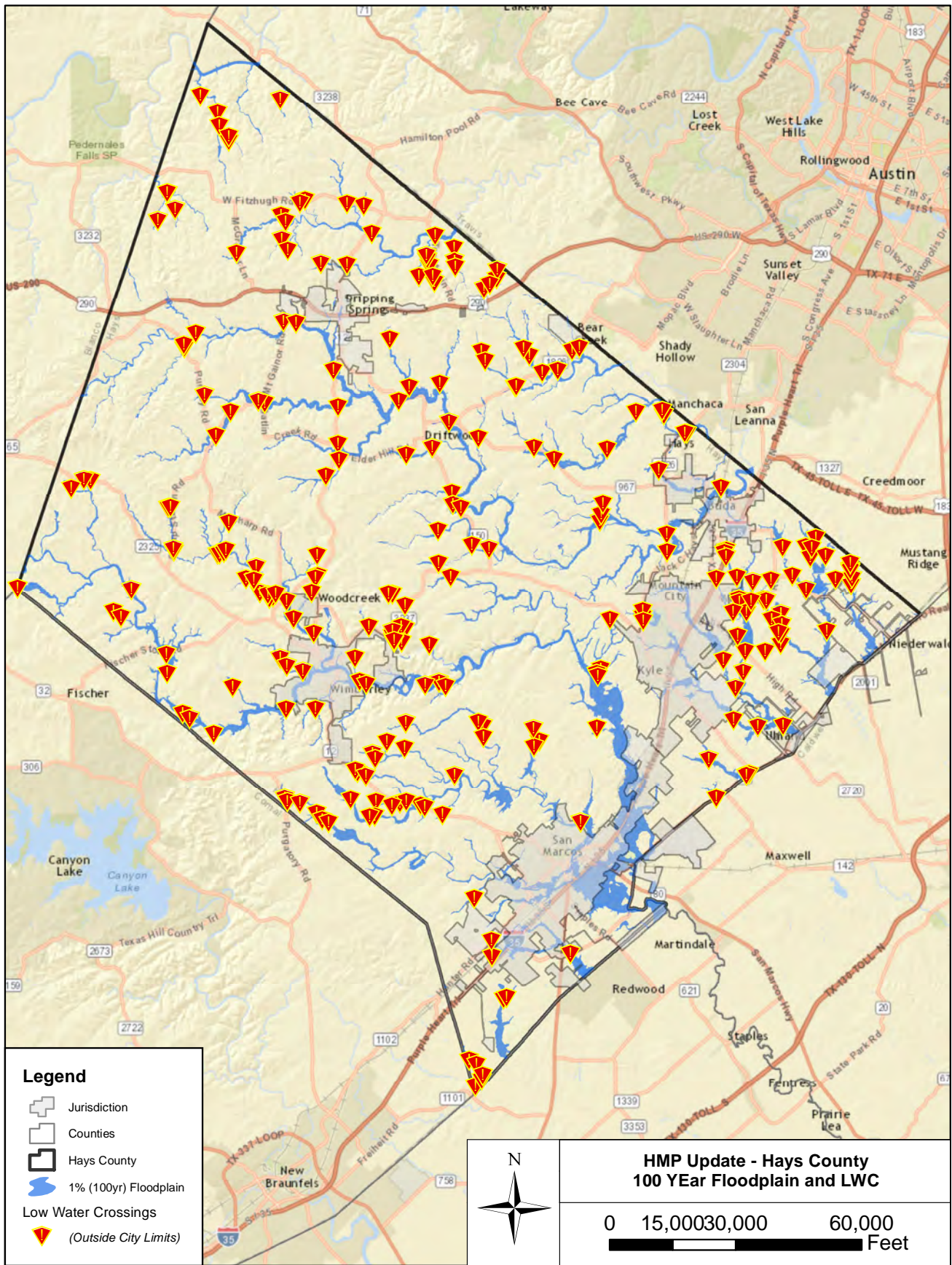


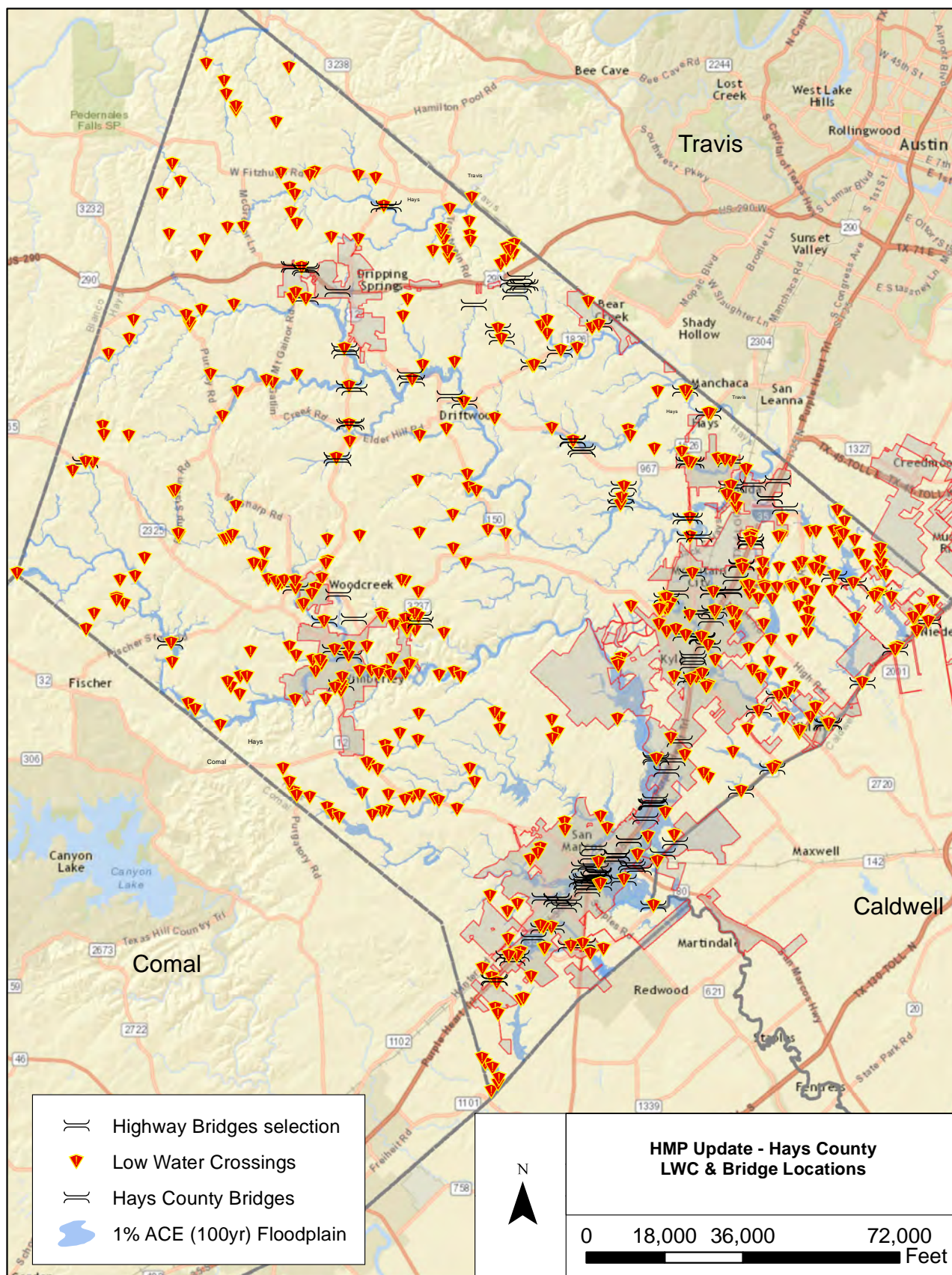
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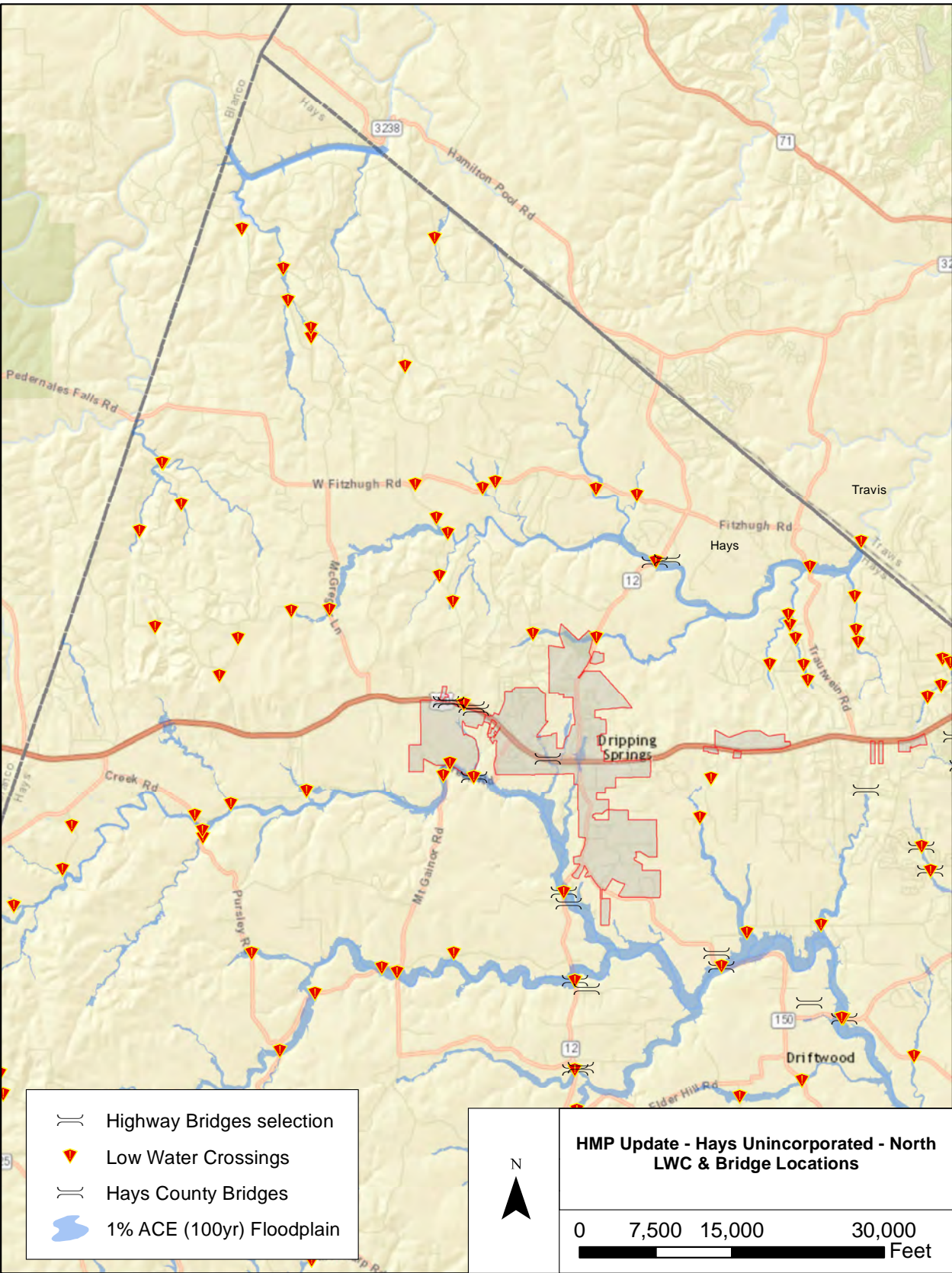




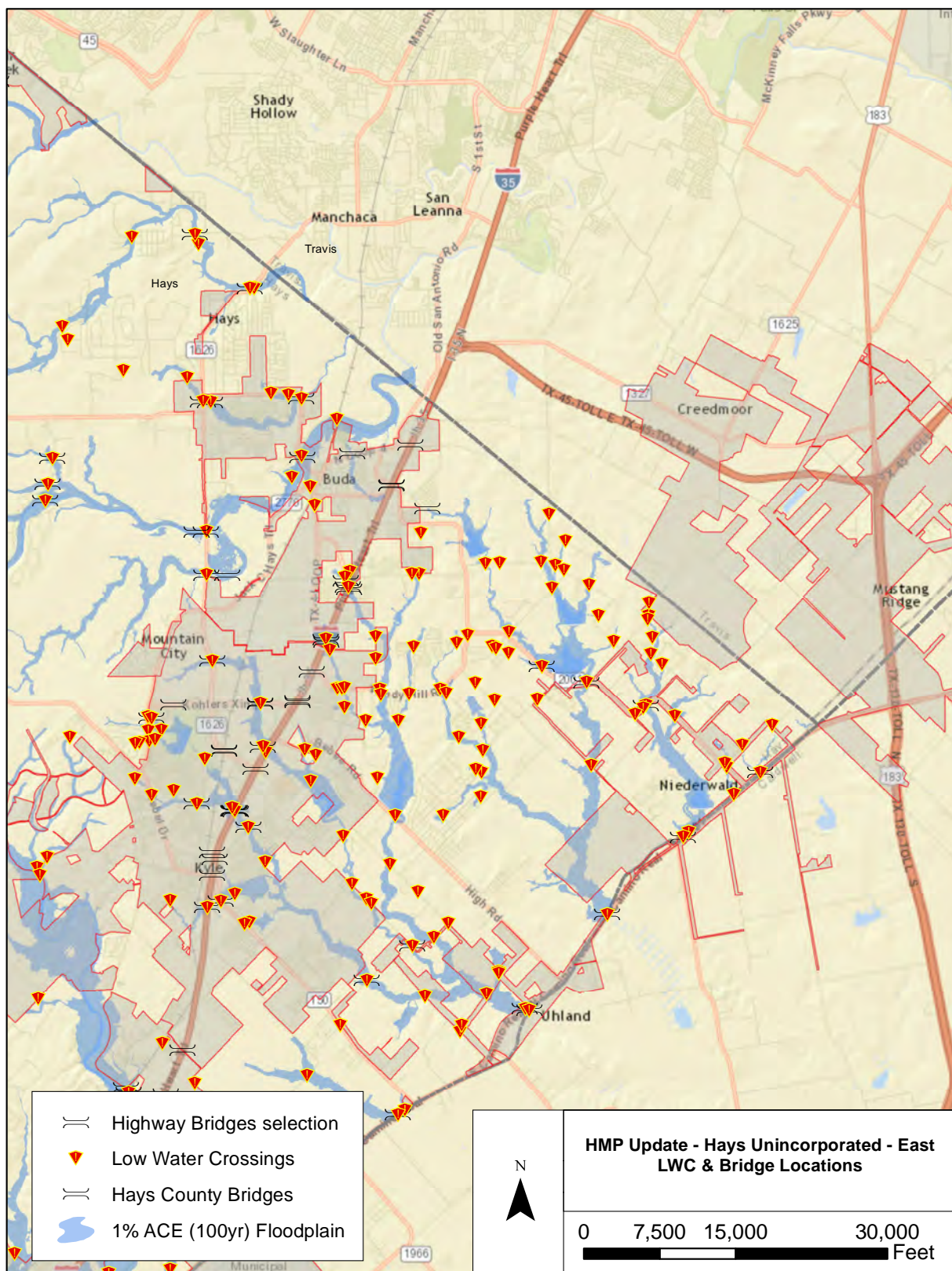




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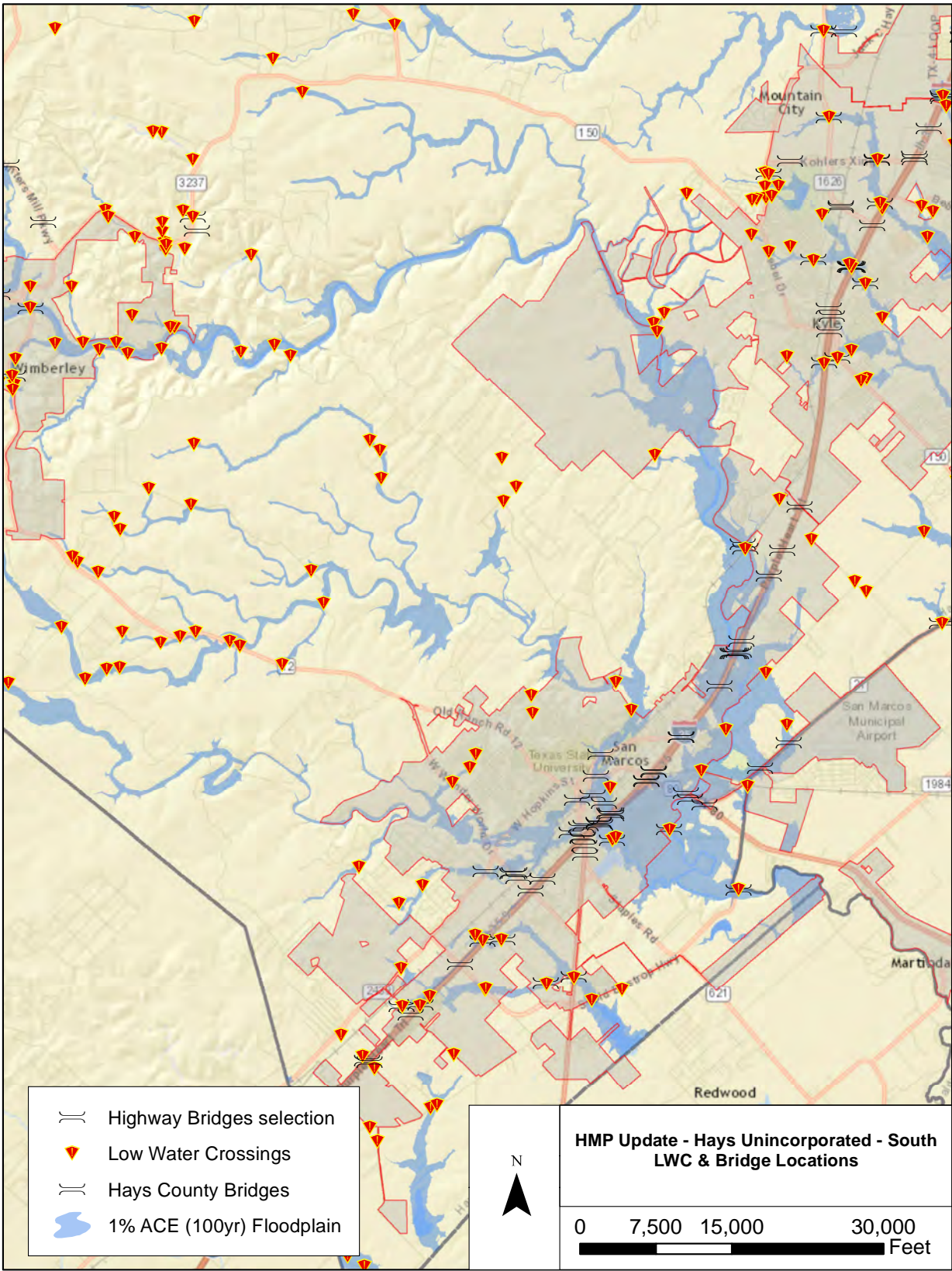


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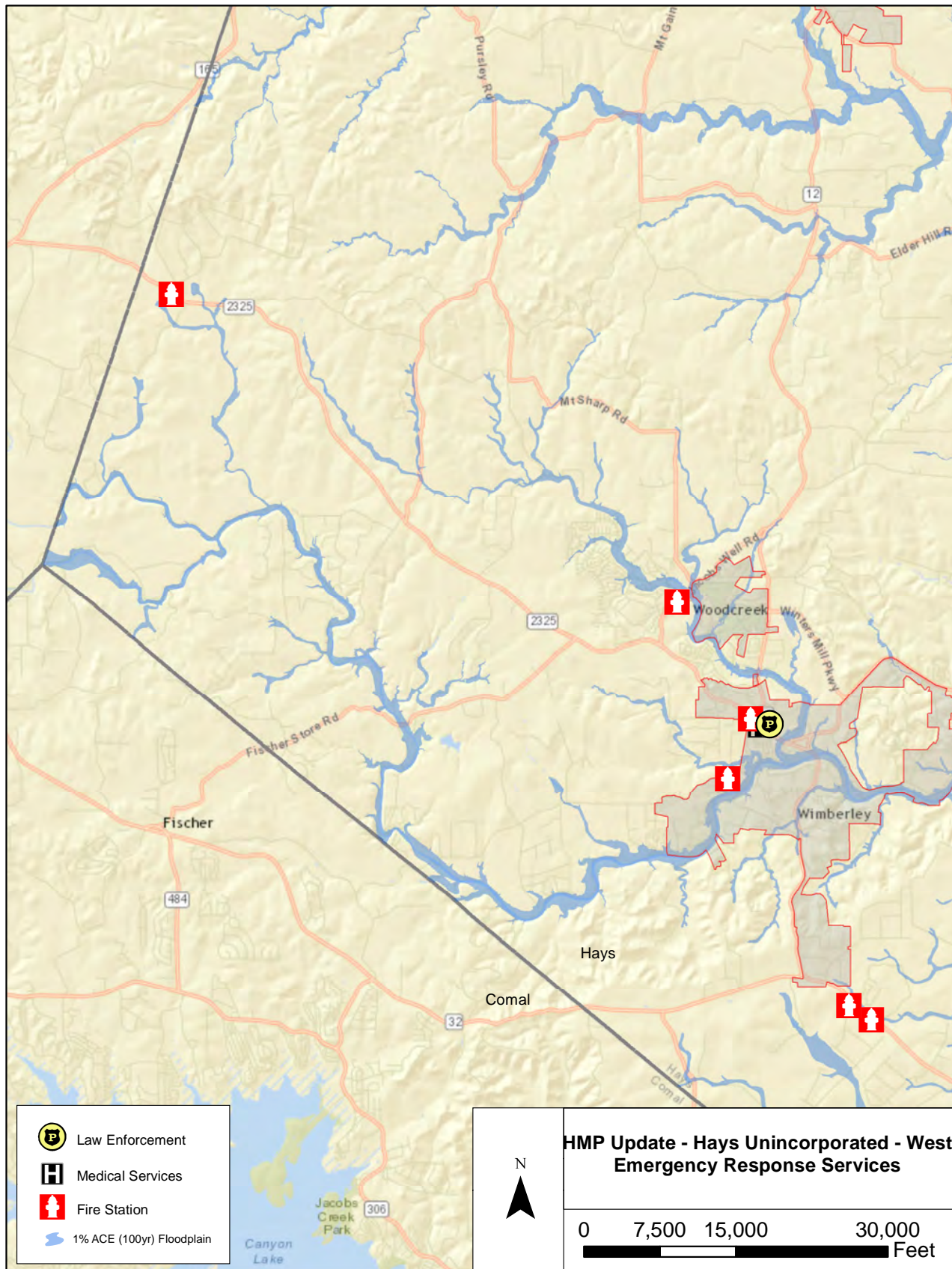


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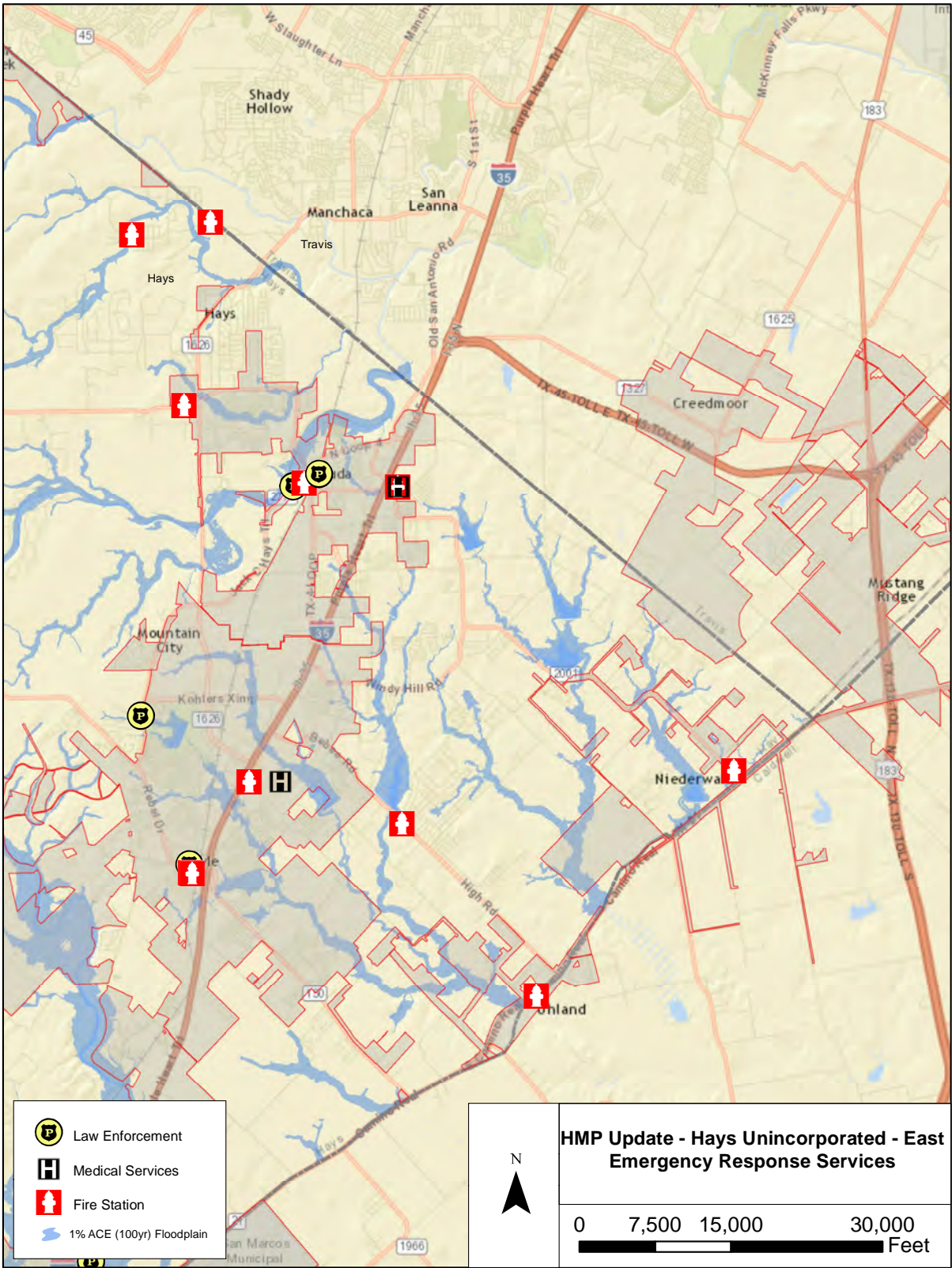
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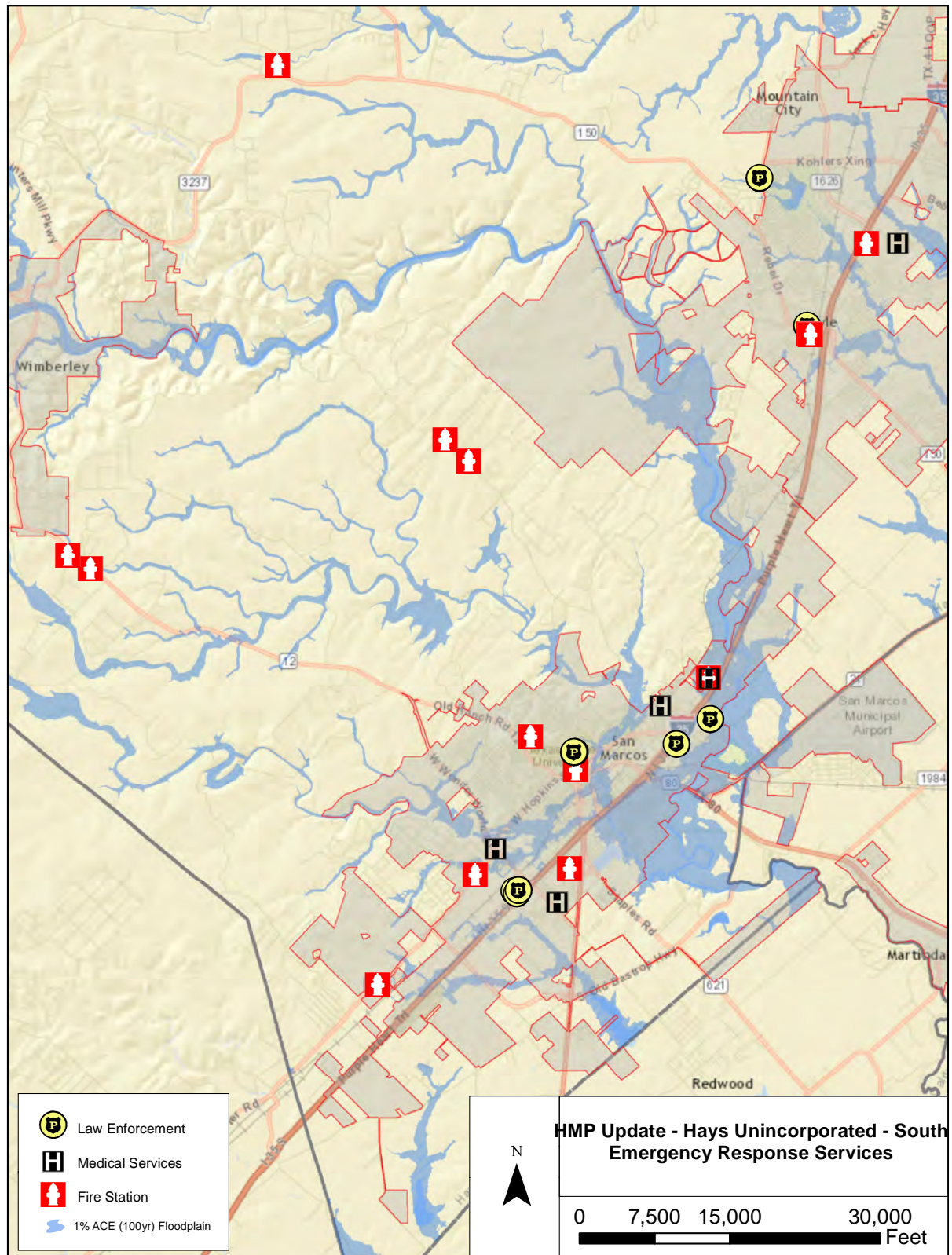
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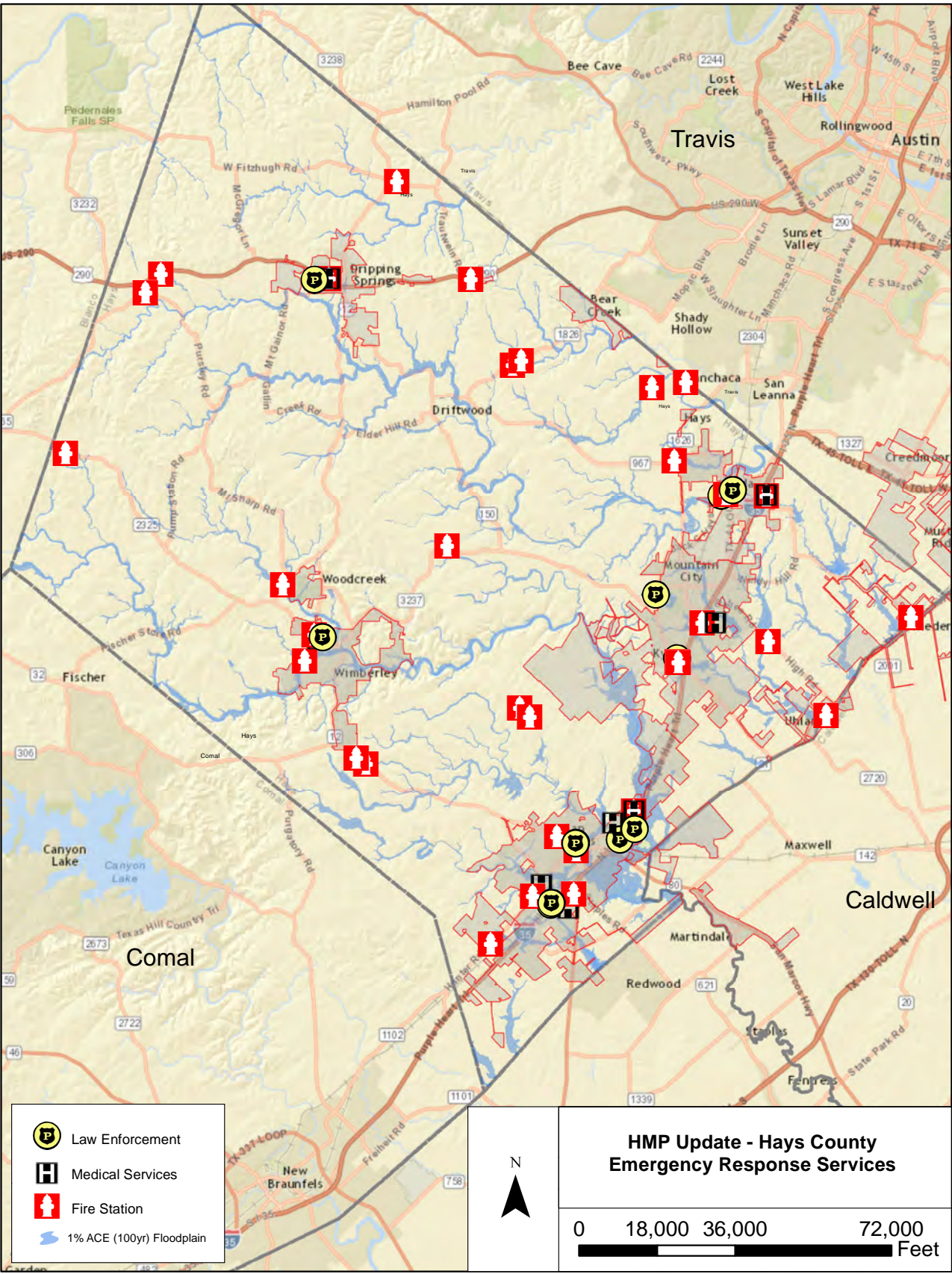


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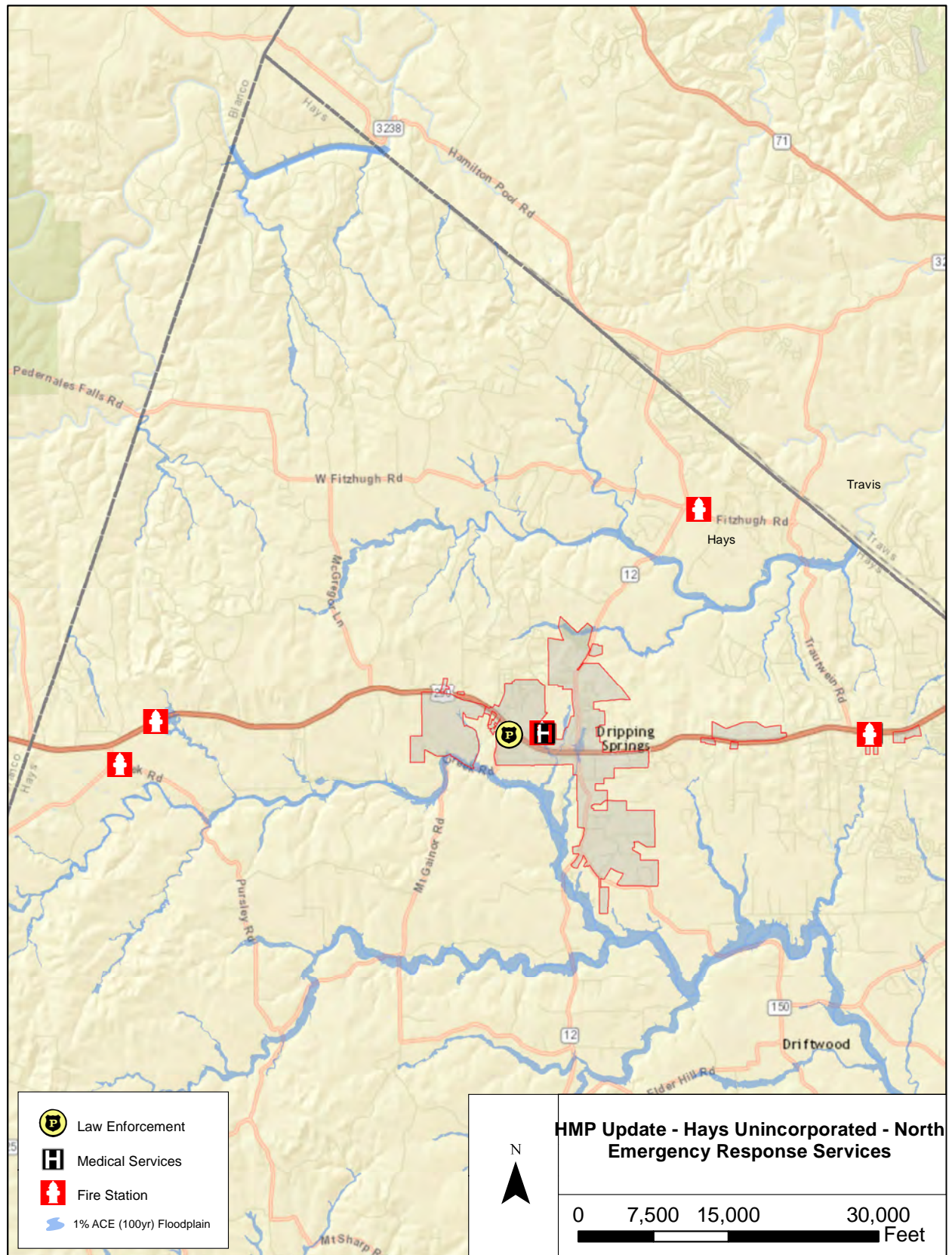


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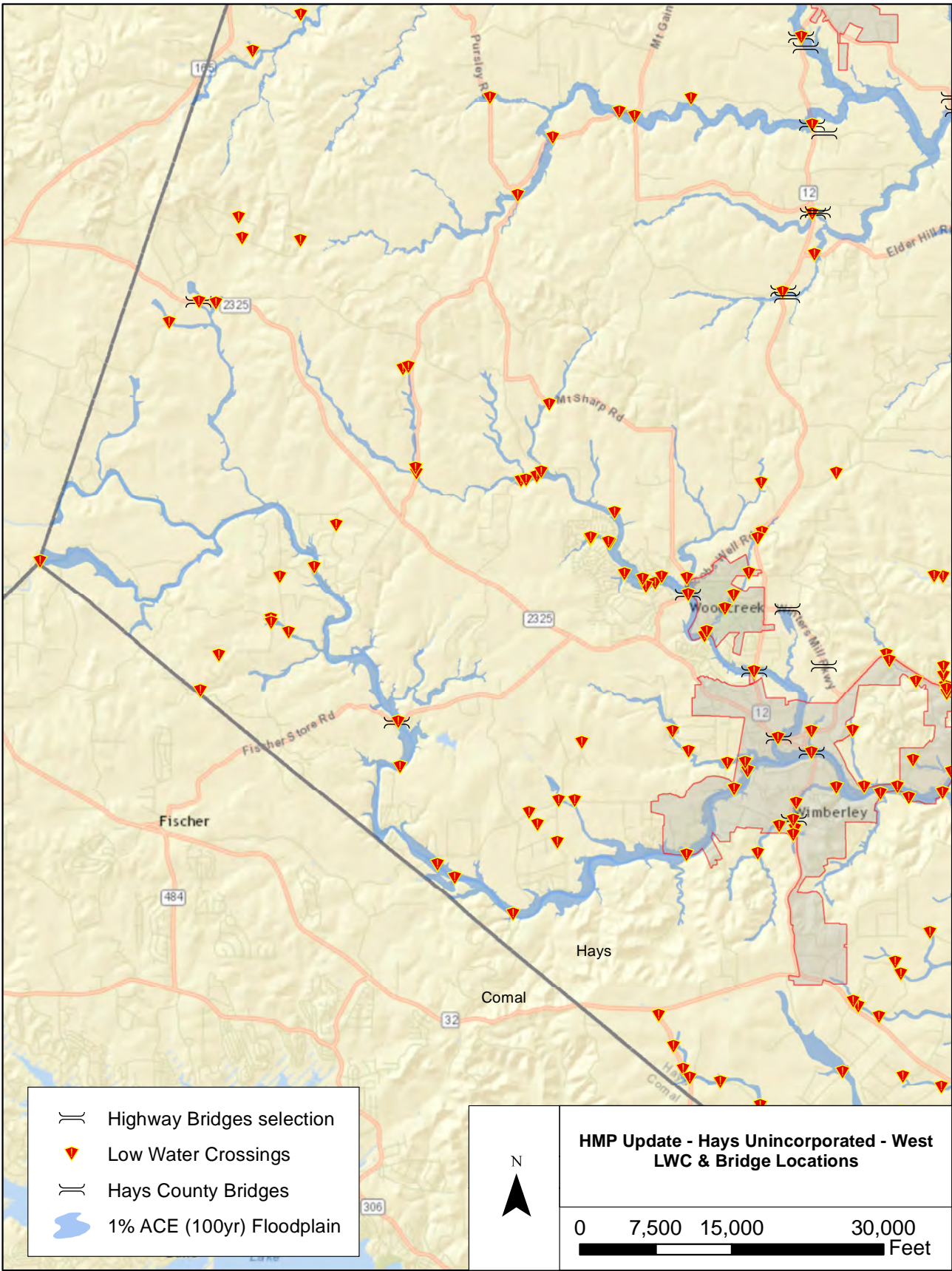


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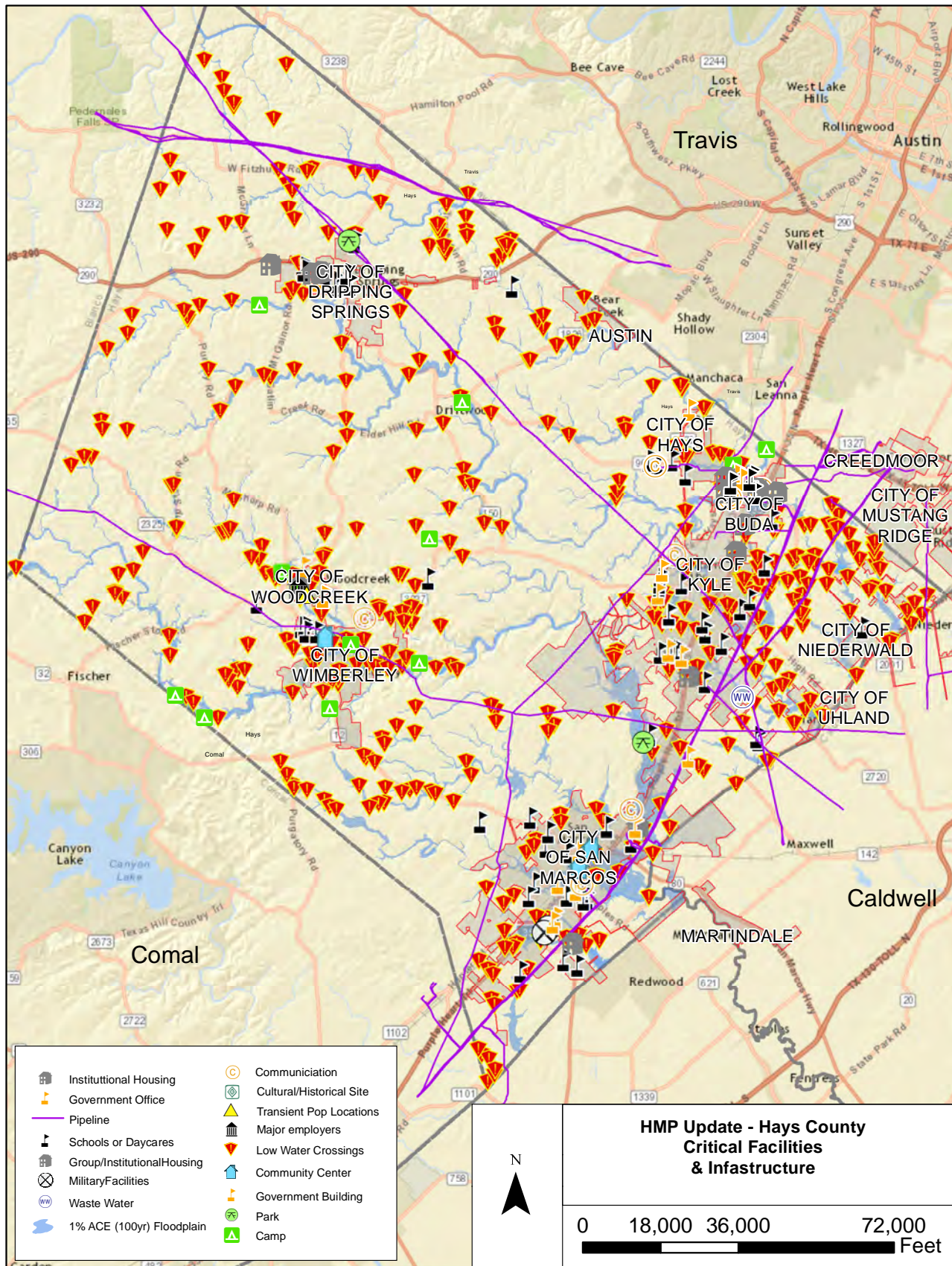
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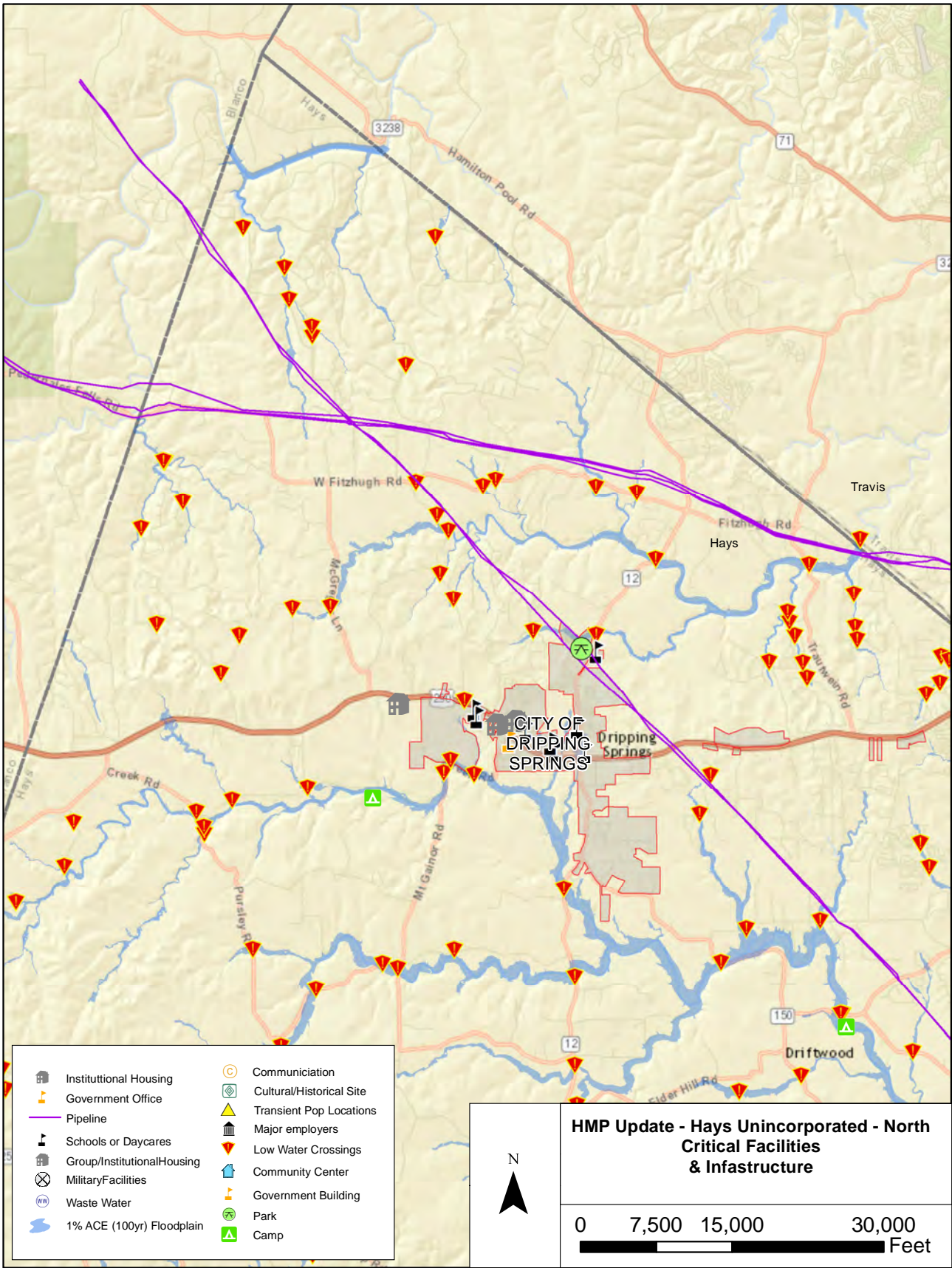


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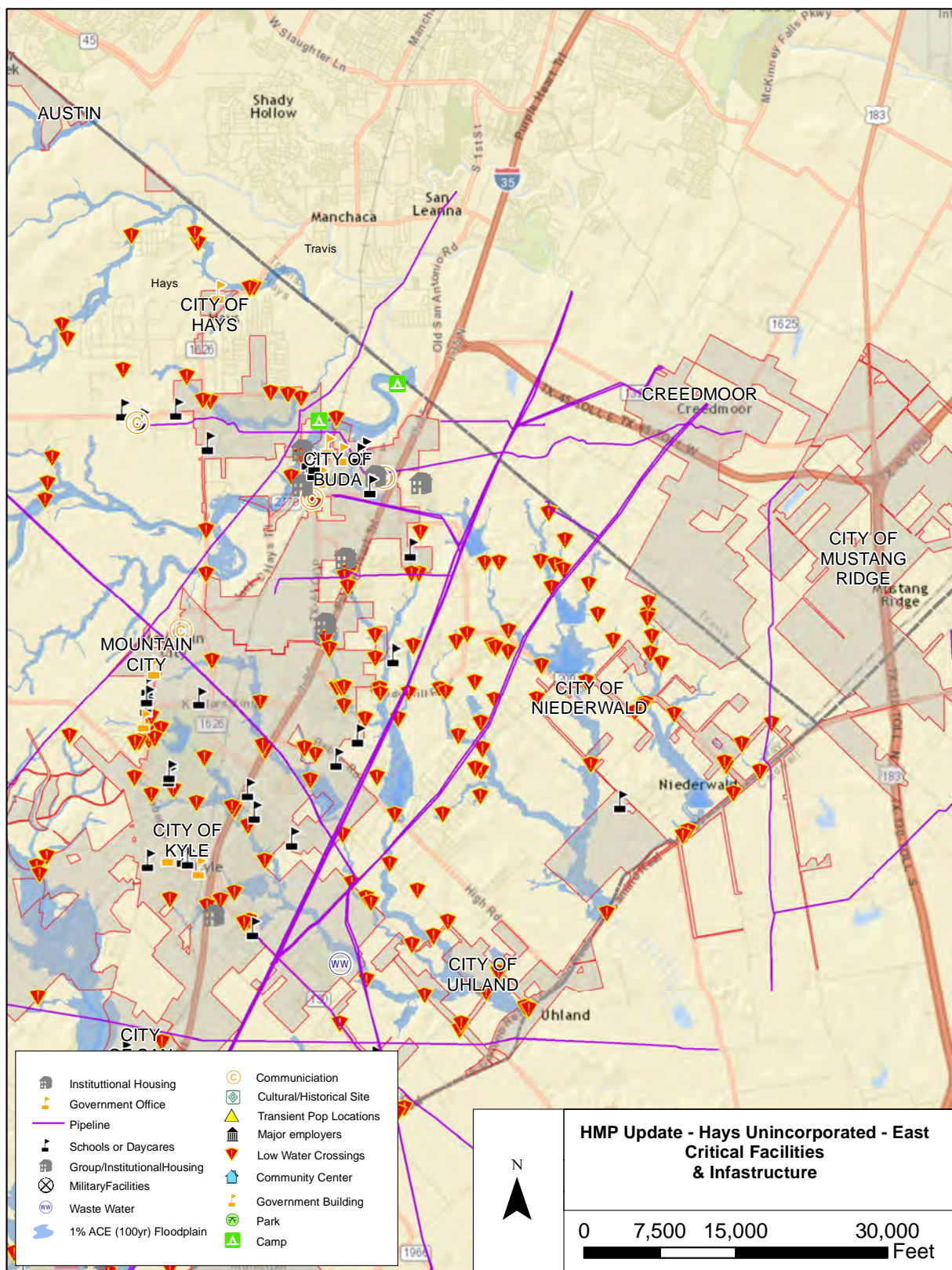
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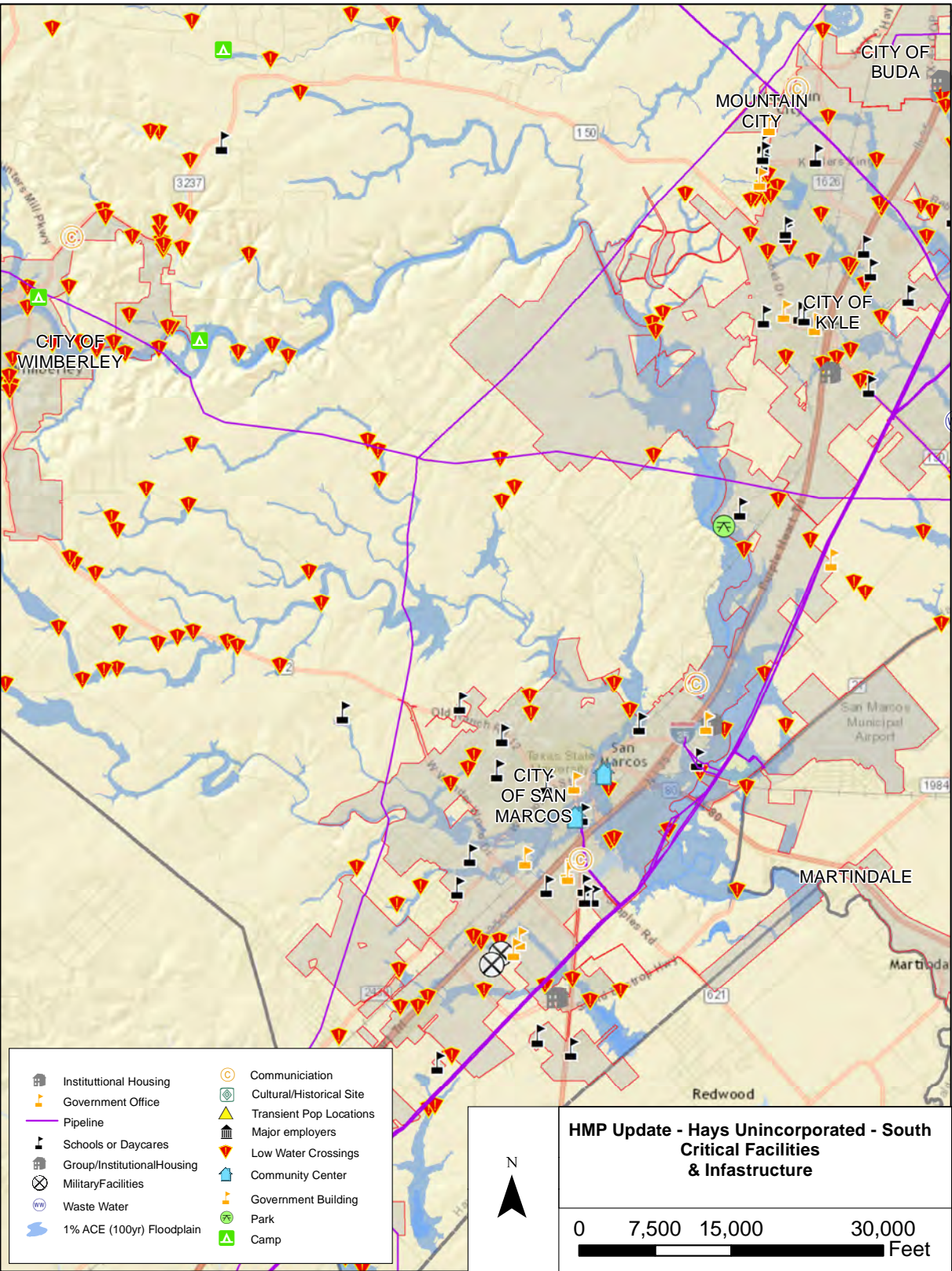


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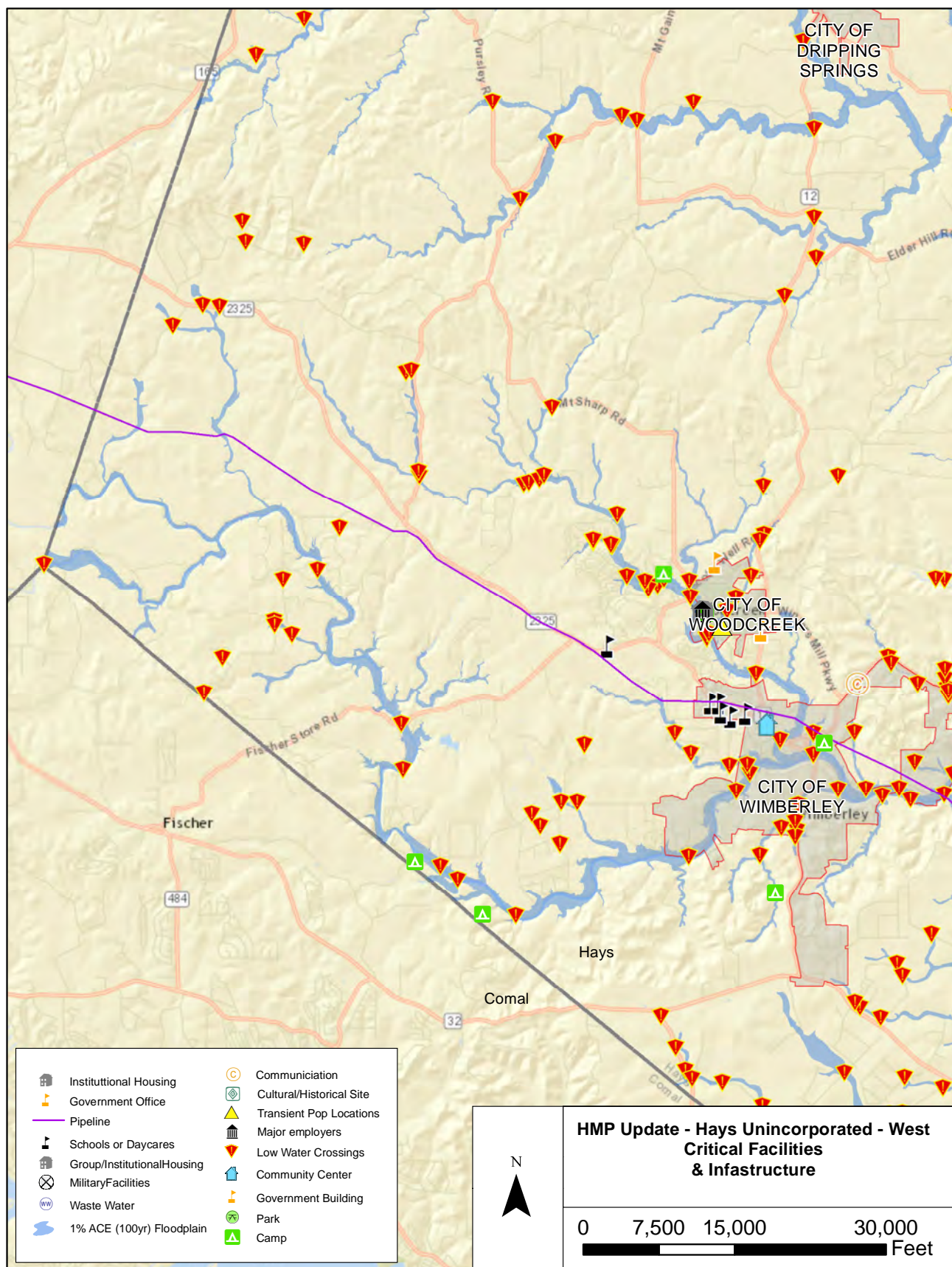


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