



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

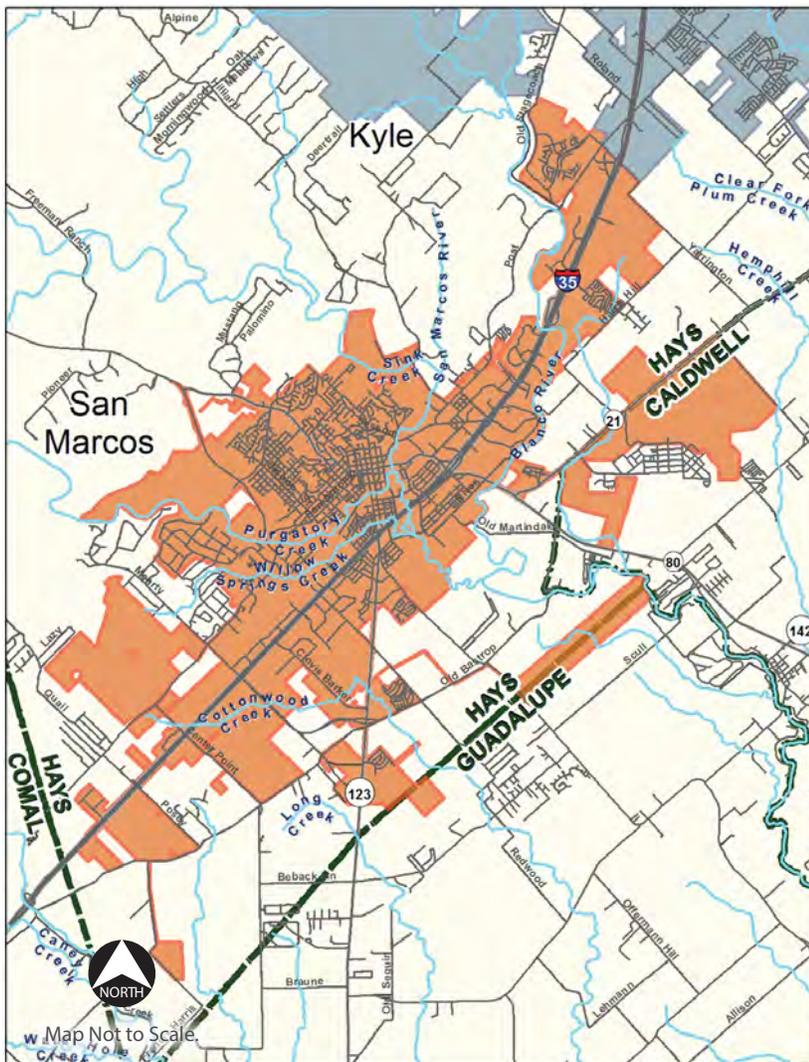
This section contains a brief description of the City of San Marcos and its jurisdictional features. In addition, Section 1 contains the following details regarding San Marcos’:

- 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)

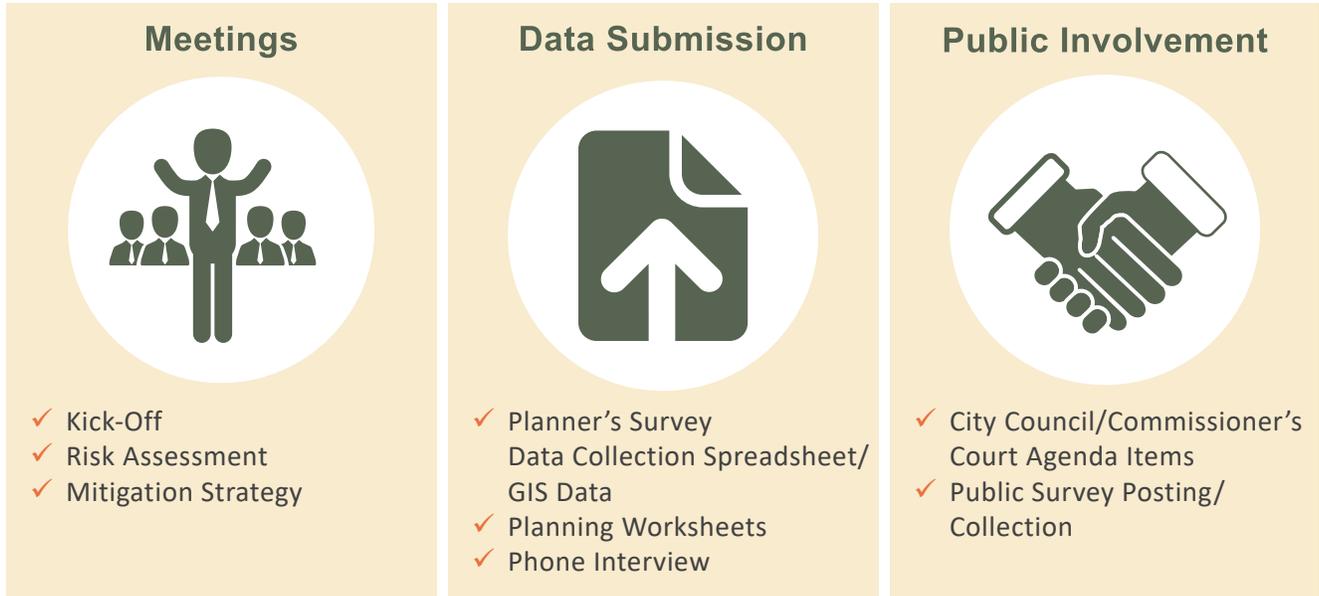
Table SM.2, Utility Providers

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 <p>(Espey Consultants, 2007)</p>



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

Name of Document	Type	How Incorporated
San Marcos Water Master Plan Update 2016		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	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
<p>Vision San Marcos: A River Runs Through Us- Comprehensive Plan</p>	<p>Plan</p>	<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	Incapacitating Non-Possible 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.



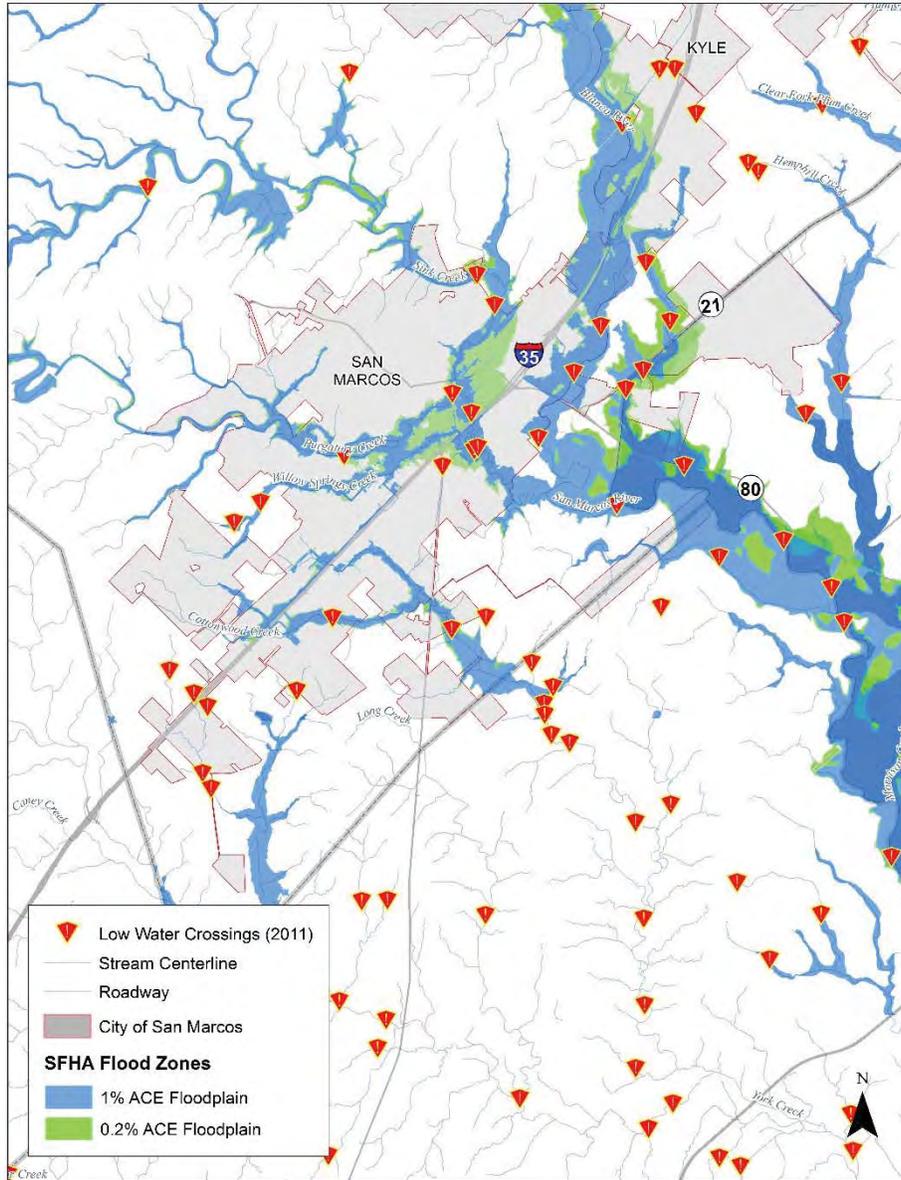


Floods

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 San Marcos are shown in Figure SM.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 SM.6 provides the total acreage in the jurisdiction that is located in the 1% and 0.2% floodplains.

Figure SM.3, Special Flood Hazard Areas and Low Water Crossings, City of San Marcos



(Texas Natural Resources Information System, 2011)

Table SM.6, City of San Marcos Floodplain Acreage

Jurisdiction	100yr (1%) Floodplain Acres (Includes Floodway)	500yr (0.2%) Floodplain Acres (Includes 100yr)
City of San Marcos	4,250	5,938





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



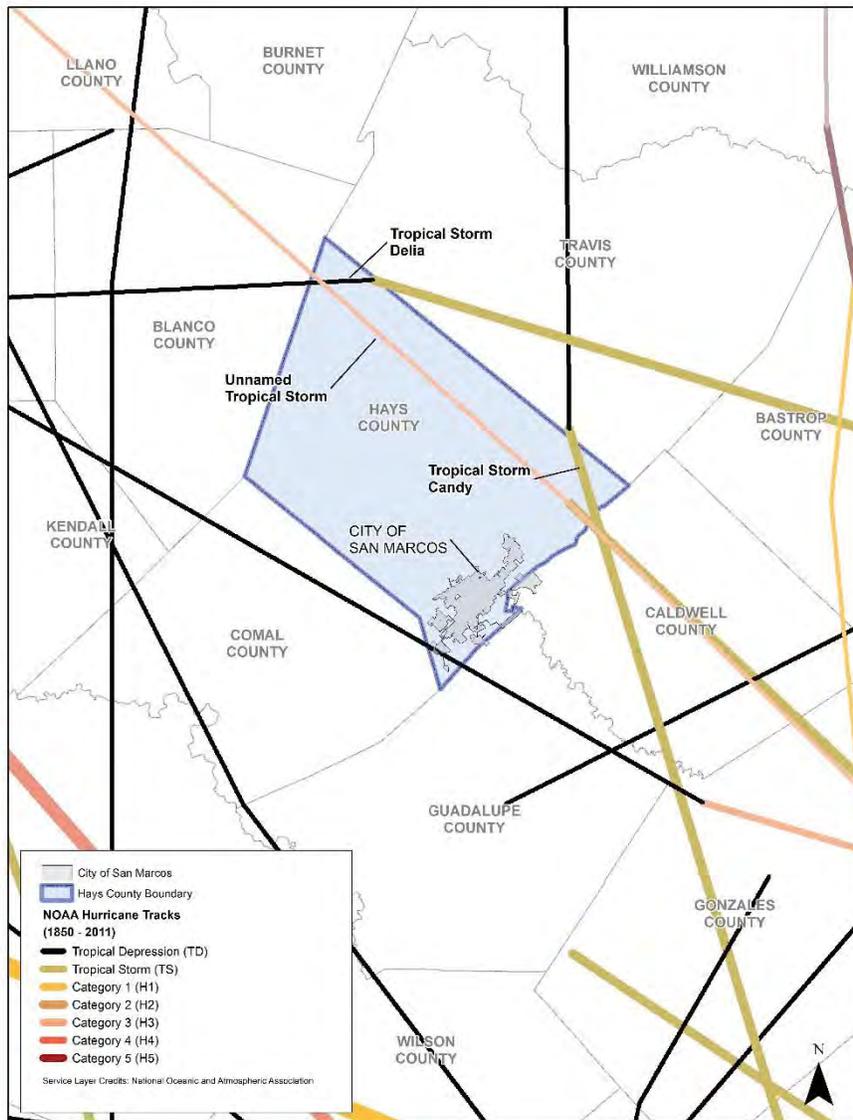


Hurricanes/Tropical Storms

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.



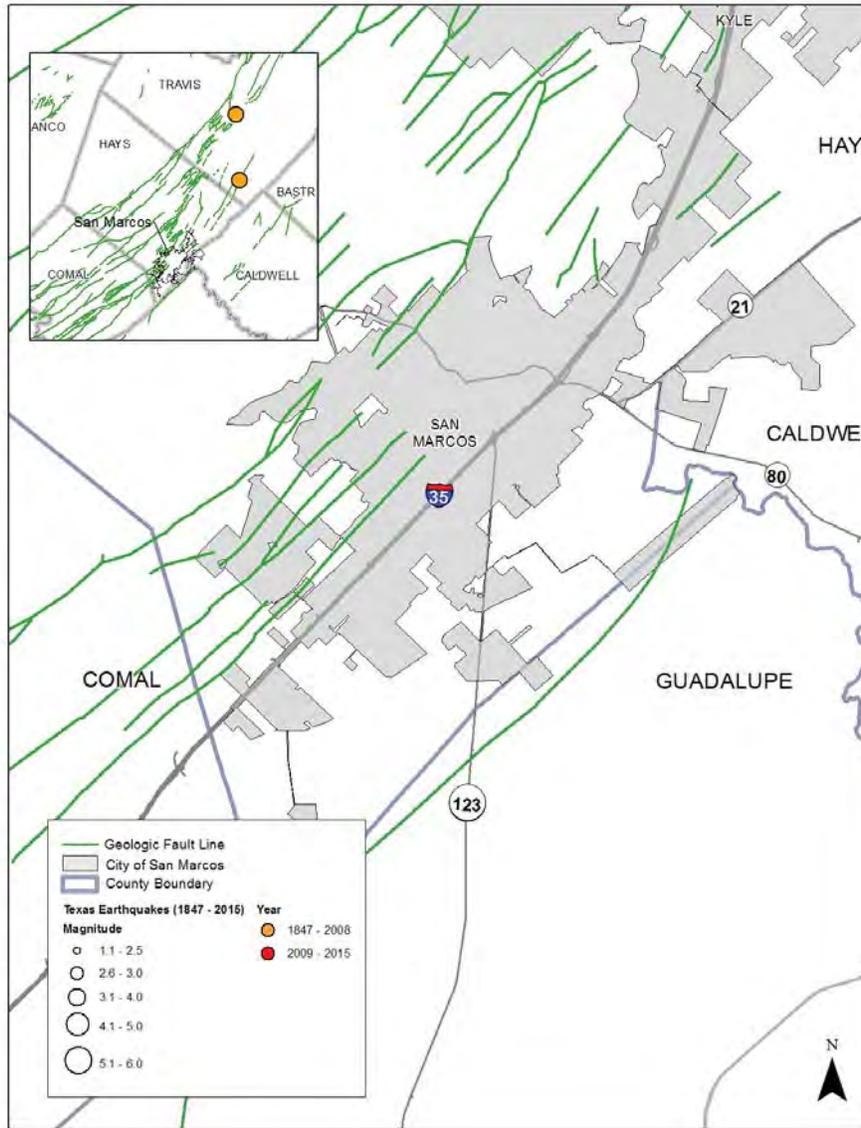


Earthquakes

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.



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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.



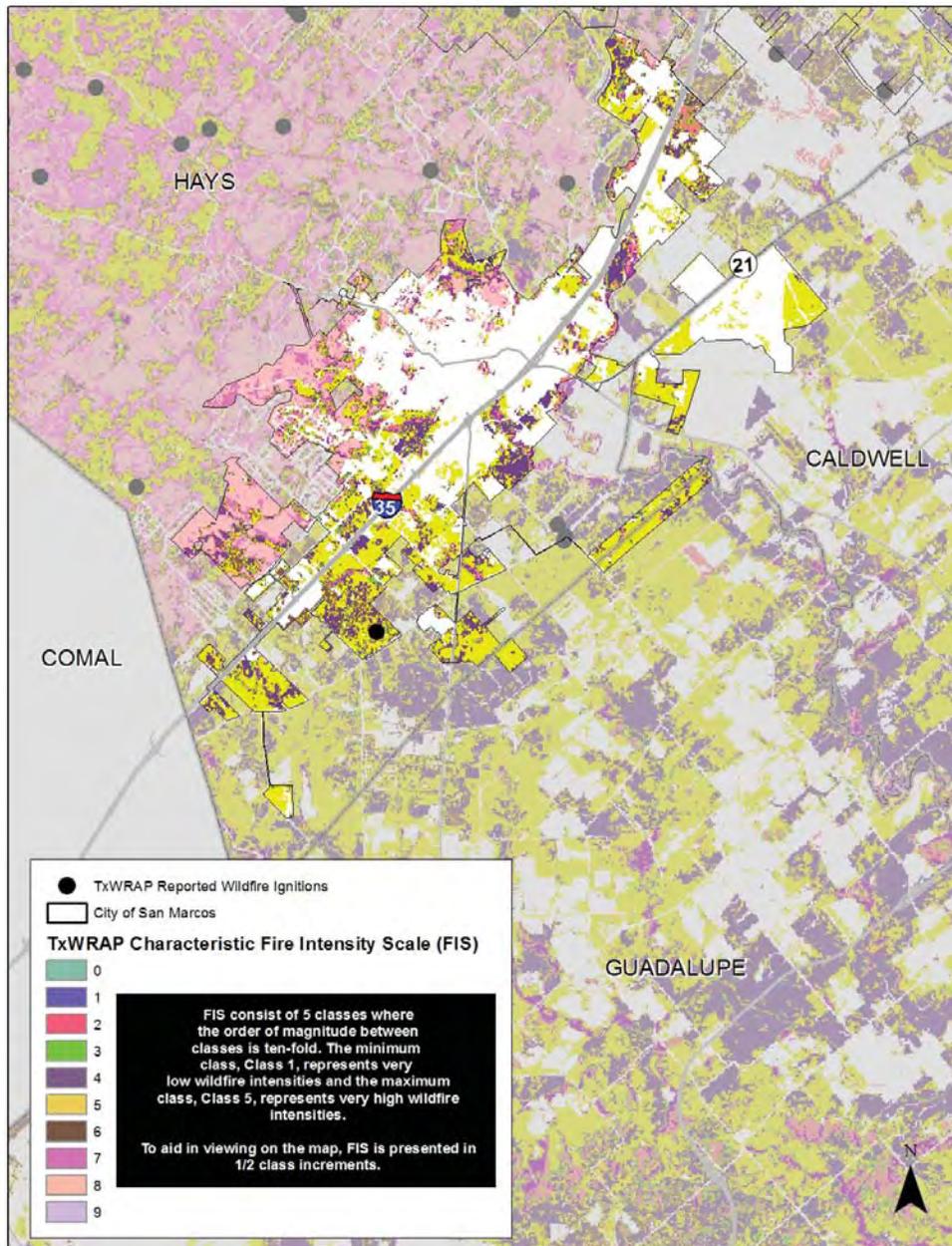


Wildfires

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.				



Hays County Hazard Mitigation Plan, City of San Marcos Annex

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.				



Hays County Hazard Mitigation Plan, City of San Marcos Annex

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.				



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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.				



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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)	

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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



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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			



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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		



Jurisdiction Adoption Documentation Placeholder

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