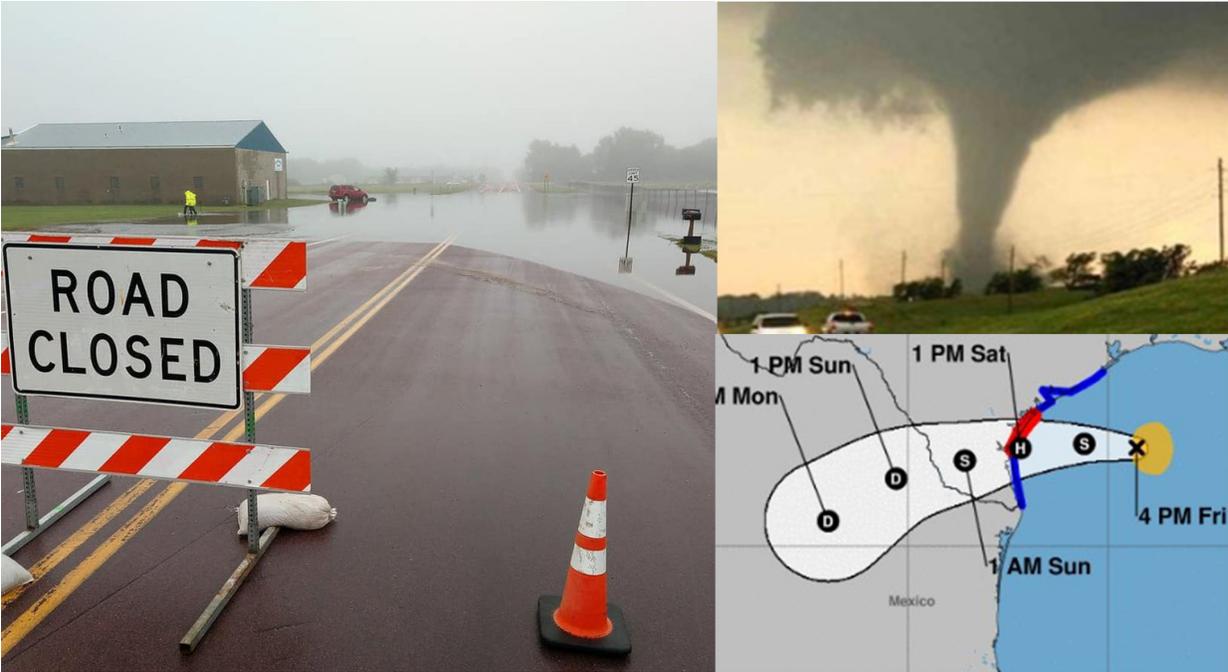


# CITY OF WESLACO

## HAZARD MITIGATION PLAN 2020



*Maintaining a Safe, Secure, and Sustainable Community*

For more information, visit our website at:

[weslacotx.gov](http://weslacotx.gov)

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## BACKGROUND

The City of Weslaco is located in south central Hidalgo County, about fifteen miles west of Harlingen. Weslaco derives its name from the **W. E. Stewart Land Company**. It is bordered to the east by the City of Mercedes and to the west by the City of Donna. Interstate 2 and U.S. Route 83 pass through Weslaco, leading west to McAllen and east to Harlingen. Weslaco is seven miles north of the bridge over the Rio Grande to Nuevo Progreso in the Mexican state of Tamaulipas.

Texas is prone to extremely heavy rains and flooding, holding half of the world-record rainfall rates (48 hours or less).<sup>1</sup> While flooding is a well-known risk, the City of Weslaco is susceptible to a wide range of natural hazards, including but not limited to: extreme heat, tornadoes, hail, and wildfires. These life-threatening hazards can destroy property, disrupt the economy, and lower the overall quality of life for individuals.

While it is impossible to prevent an event from occurring, the effects from many hazards to people and property can be lessened. This concept is known as hazard mitigation, which is defined by the Federal Emergency Management Agency (FEMA) as *sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects*.<sup>2</sup> Communities participate in hazard mitigation by developing hazard mitigation plans. The Texas Division of Emergency Management (TDEM) is required to review the plan before the plan is sent to FEMA for review and final approval in accordance with the Disaster Mitigation Act of 2000.

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

## SCOPE AND PARTICIPATION

The City of Weslaco’s 2020 Plan is a single jurisdictional plan. Numerous entities and businesses participated as stakeholders in the Plan, including Economic Development Corporation of Weslaco, Hidalgo County, medical centers, and Weslaco ISD. These groups, and others, provided valuable input into the planning process.

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<sup>1</sup> [http://floodsafety.com/texas/regional\\_info/regional\\_info/austin\\_zone.htm](http://floodsafety.com/texas/regional_info/regional_info/austin_zone.htm)  
<sup>2</sup> <http://www.fema.gov/hazard-mitigation-planning-resources>

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The focus of the 2020 Plan is to identify activities to mitigate hazards classified as “high” or “moderate” risk, as determined through a detailed hazard risk assessment conducted for the City of Weslaco. The hazard classification enables the City to prioritize mitigation actions based on hazards which can present the greatest risk to lives and property in the geographic scope (i.e. planning area).

### PURPOSE

The 2020 Plan was prepared by the City of Weslaco and H2O Partners, Inc. The purpose of the Plan is to protect people and structures, and to minimize the costs of disaster response and recovery. The goal of the Plan is to minimize or eliminate long-term risks to human life and property from known hazards, by identifying and implementing cost-effective hazard mitigation actions. The planning process is an opportunity for the City of Weslaco, stakeholders, and the general public to evaluate and develop successful hazard mitigation actions, reducing the future risk of fatalities and property damage resulting from a disaster in the Weslaco planning area.

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

The City of Weslaco and planning participants identified 11 natural hazards to be addressed by the Plan. The specific goals of the Plan are to:

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

### AUTHORITY



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

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with FEMA's Community Rating System (CRS) Floodplain Management Plan standards and policies.

### SUMMARY OF SECTIONS

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

Sections 4 through 15 present a hazard overview and information on individual natural hazards in the planning area. The hazards generally appear in order of priority based on potential losses to life and property and other community concerns. For each hazard, the Plan presents a description of the hazard, a list of historical hazard events, and the results of the vulnerability and risk assessment process.

Section 16 presents hazard mitigation goals and objectives. Section 17 presents hazard mitigation actions for the City of Weslaco. Section 18 identifies Plan maintenance mechanisms.

A list of Planning Team members is located in Appendix A. Public survey results are analyzed and presented in Appendix B. Appendix C contains a detailed list of critical facilities for the planning area. Appendix D contains information regarding workshops, including meeting documentation. The Capability Assessment for the City of Weslaco is located in Appendix E.<sup>3</sup>

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<sup>3</sup> Information contained in some of these appendices are exempt from public release under the Freedom of Information Act (FOIA).

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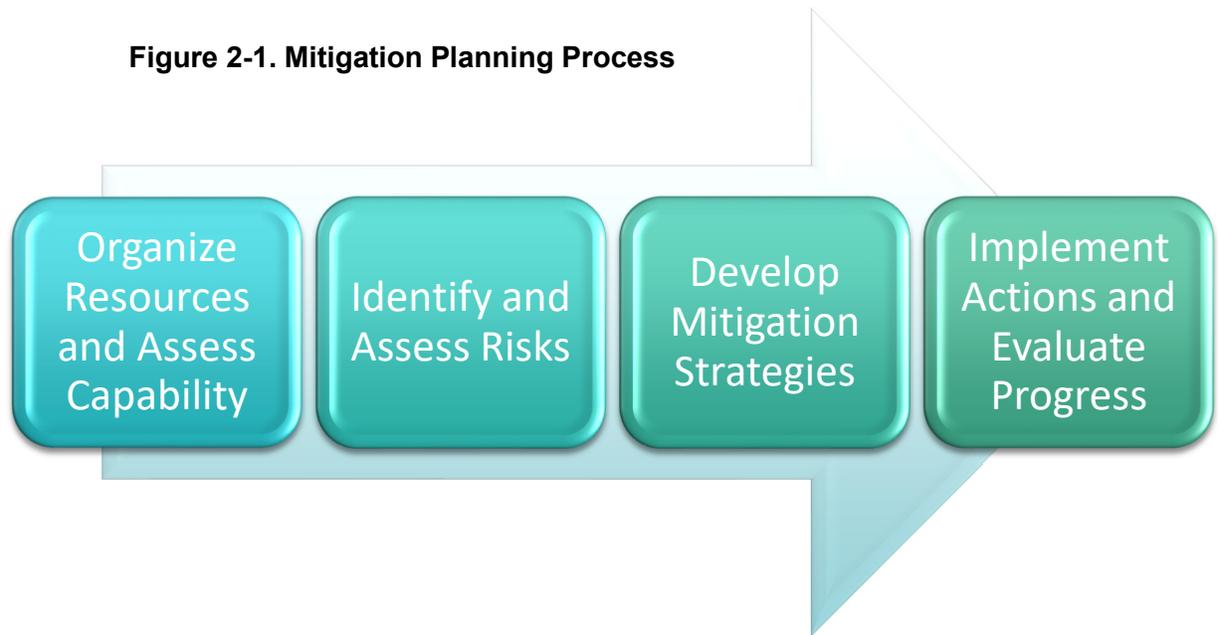
## PLAN PREPARATION AND DEVELOPMENT

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

### OVERVIEW OF THE PLAN

The City of Weslaco hired H2O Partners, Inc. (Consultant Team), to provide technical support and oversee the development of the 2020 Plan. The Consultant Team used the Federal Emergency Management Agency’s (FEMA) “Local Mitigation Plan Review Guide” (October 1, 2011) and the “Local Mitigation Planning Handbook” (March 2013) to develop the Plan. The overall planning process is shown in Figure 2-1 below.

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The City of Weslaco and the Consultant Team met in February 2020 to begin organizing resources, identifying Planning Team members, and conducting a Capability Assessment.

### PLANNING TEAM

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

**Table 2-1. Executive Planning Team**

DEPARTMENT	TITLE
City of Weslaco	Fire Chief / Emergency Management Coordinator
City of Weslaco	Assistant City Manager

**Table 2-2. Advisory Planning Team**

DEPARTMENT	TITLE
City of Weslaco	City Manager

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DEPARTMENT	TITLE
City of Weslaco	Director Planning Code Enforcement
City of Weslaco	City Engineer
City of Weslaco	Health Official
City of Weslaco	Fire Marshal
City of Weslaco	Public Works
City of Weslaco	IT Director
City of Weslaco	Chief of Police
City of Weslaco	Police Captain
City of Weslaco	City Secretary
City of Weslaco	Finance Director
City of Weslaco	Fire / EMS Lieutenant
City of Weslaco	Assistant Chief of Police
City of Weslaco	Public Information Officer
City of Weslaco	Emergency Manager
City of Weslaco	Assistant Public Works Director
City of Weslaco	Airport

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

Based on results of the completed Capability Assessment, the City of Weslaco described methods for achieving future hazard mitigation measures by expanding existing capabilities. For example, the City of Weslaco does not have a Community Wildfire Protection Plan (CWPP) in place. Other options for improving capabilities include the following:

- Establishing Planning Team members with the authority to monitor the Plan and identify grant funding opportunities for expanding staff.
- Identifying opportunities for cross-training or increasing the technical expertise of staff by attending free training available through FEMA and the Texas Division of Emergency Management (TDEM), and by monitoring classes and availability through [preparingtexas.org](http://preparingtexas.org).
- Reviewing current floodplain ordinances for opportunities to increase resiliency, (above current standards) such as modifying permitting or building codes.

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- Developing ordinances that will require all new developments to conform to the higher mitigation standards, exceeding current requirements.

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

The Planning Team developed hazard mitigation actions for mitigating risk from potential flooding and hurricanes; these actions include city-wide culvert crossings upgrades, as well as drainage improvement projects. The Plan Update also includes an action to provide back-up generators to all grant funded critical facilities to ensure continuity of operations after a hazard event.

### PLANNING PROCESS

The process used to prepare the 2020 Plan followed the four major steps included in Figure 2-1. After the Planning Team was organized, a capability assessment was developed and distributed at the Kick-Off Workshop. Hazards were identified and assessed, and results associated with each of the hazards were provided at the Risk Assessment Workshop. Based on the City of Weslaco's identified vulnerabilities, specific mitigation strategies were discussed and developed at the Mitigation Strategy Workshop. Finally, Plan maintenance and implementation procedures were developed and are included in Section 18. Participation of Planning Team members, stakeholders, and the public at each of the workshops is documented in Appendix D.

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

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

### KICKOFF WORKSHOP

The Kickoff Workshop was held at Weslaco City Hall in the legislative chamber on February 20, 2020. The initial workshop informed City officials and key department personnel about how the planning process pertained to their distinct roles and responsibilities, and engaged stakeholder groups such as Hidalgo County, and surrounding Cities. In addition to the kickoff presentation, participants received the following information:

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

A risk ranking exercise was conducted at the Kickoff Workshop to get input from the Planning Team and stakeholders pertaining to various risks from a list of natural hazards affecting the

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planning area. Participants ranked hazards from high to low in terms of perceived level of risk, frequency of occurrence, and potential impact.

### HAZARD IDENTIFICATION

At the Kickoff Workshop and through e-mail and phone correspondence, the Planning Team conducted preliminary hazard identification. In coordination with the Consultant Team, the Planning Team reviewed and considered a full range of natural hazards. Once identified, the teams narrowed the list to significant hazards by reviewing hazards affecting the area as a whole, the 2018 State of Texas Hazard Mitigation Plan Update, and initial study results from reputable sources such as federal and state agencies. Based on this initial analysis, the teams identified a total of 11 natural hazards which pose a significant threat to the planning area.

### RISK ASSESSMENT

An initial risk assessment for the City of Weslaco was completed in May 2020 and results were presented to Planning Team members at the Risk Assessment / Mitigation Strategy Workshop webinar held on May 28, 2020. At the workshop, the characteristics and consequences of each hazard were evaluated to determine the extent to which the planning area would be affected in terms of potential danger to property and citizens.

Potential dollar losses from each hazard were estimated using NOAA's National Centers for Environmental Information (NCEI). The damages given are for property and crop damage. The resulting risk assessment profiled hazard events, provided information on previous occurrences, estimated probability of future events, and detailed the spatial extent and magnitude of impact on people and property. Each participant at the Risk Assessment Workshop was provided a risk ranking sheet that asked participants to rank hazards in terms of the probability or frequency of occurrence, extent of spatial impact, and the magnitude of impact. The results of the ranking sheets identified unique perspectives on varied risks throughout the planning area.

The assessments were also used to set priorities for hazard mitigation actions based on potential loss of life and dollar losses. A hazard profile and vulnerability analysis for each of the hazards can be found in Sections 4 through 15.

### MITIGATION REVIEW AND DEVELOPMENT

Developing the Mitigation Strategy for the Plan involved identifying mitigation goals and new mitigation actions. A Risk Assessment / Mitigation Strategy Workshop webinar was held on May 28, 2020. In addition to the Planning Team, stakeholder groups were invited to attend the workshop. Regarding hazard mitigation actions, Workshop participants emphasized the desire for actions that addressed flood and hurricane hazards. Additionally, the City was proactive in identifying mitigation actions to lessen the risk of all the identified hazards included in the Plan.

An inclusive and structured process was used to develop and prioritize new hazard mitigation actions for the 2020 Plan. The prioritization method was based on FEMA's STAPLE(E) criteria and included social, technical, administrative, political, legal, economic, and environmental considerations. As a result, each Planning Team Member assigned an overall priority to each hazard mitigation action. The overall priority of each action is reflected in the hazard mitigation actions found in Section 17.

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

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Specifically, the process involved:

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

Hazard mitigation actions identified in the process were made available to the Planning Team for review. The draft 2020 Plan was posted on the City of Weslaco's website for the general public to review.

## REVIEW AND INCORPORATION OF EXISTING PLANS

### REVIEW

Background information utilized during the planning process included various studies, plans, reports, and technical information from sources such as FEMA, the United States Army Corps of Engineers (USACE), the U.S. Fire Administration, National Oceanic and Atmospheric Administration (NOAA), the Texas Water Development Board (TWDB), the Texas Commission on Environmental Quality (TCEQ), the Texas State Data Center, Texas A&M Forest Service, the Texas Division of Emergency Management (TDEM), and local hazard assessments and plans. Section 4 and the hazard-specific sections of the Plan (Sections 5-15) summarize the relevant background information.

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

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### INCORPORATION OF EXISTING PLANS INTO THE HMAP PROCESS

A Capability Assessment was completed by key City of Weslaco's departments and provided information pertaining to existing plans, policies, ordinances, and regulations to be integrated into the goals and objectives of the Plan. The relevant information was included in a master Capability Assessment, Appendix E.

Existing projects and studies were utilized as a starting point for discussing hazard mitigation actions among Planning and Consultant Team members. For example, the City will be beginning a Kansas and Los Torritos Drainage Project, starting in November 2020 with a completion date of November 2022 through a FEMA grant from DR 4332. Other plans were reviewed, such as Cover The Border, Hazard Mitigation Actin Plan for the Rio Grande Border, a regional plan that the City of Weslaco previously participated in. Finally, the 2018 State of Texas Mitigation Plan Update, developed by TDEM, was discussed in the initial planning meeting in order to develop a specific group of hazards to address in the planning effort. The 2018 State Plan Update was also used as a guidance document along with FEMA materials in the development of the City of Weslaco Plan.

### INCORPORATION OF THE HMAP INTO OTHER PLANNING MECHANISMS

Planning Team members will integrate implementation of the Plan with other planning mechanisms for the City of Weslaco, such as the Capital Improvement Plan. Existing plans for the City of Weslaco will be reviewed and incorporated into the Plan as appropriate. This section discusses how the Plan will be implemented by the City of Weslaco. It also addresses how the Plan will be evaluated and improved over time, and how the public will continue to be involved in the hazard mitigation planning process.

The City of Weslaco will be responsible for implementing hazard mitigation actions contained in Section 17. Each hazard mitigation action has been assigned to a specific City department that is responsible for tracking and implementing the action.

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

The City of Weslaco will integrate hazard mitigation actions contained in the Plan with existing planning mechanisms such as floodplain ordinances, Emergency Operation Plans, Evacuation Plans, and other local and area planning efforts. The City of Weslaco will work closely with area organizations to coordinate implementation of hazard mitigation actions that benefit the planning area financially and economically.

Upon formal adoption of the 2020 Plan, Planning Team members from the City of Weslaco will review existing plans along with building codes to guide development and ensure that hazard mitigation actions are implemented. Each of the departments will be responsible for coordinating periodic review of the Plan with members of the Planning Team to ensure integration of hazard mitigation strategies into these planning mechanisms and codes. The Planning Team will also conduct periodic reviews of various existing planning mechanisms and analyze the need for any amendments or updates in light of the approved Plan. The City of Weslaco will ensure that future long-term planning objectives will contribute to the goals of the Plan to reduce the long-term risk

## SECTION 2: PLANNING PROCESS

to life and property from moderate and high risk hazards. Within one year of formal adoption of the Plan, existing planning mechanisms will be reviewed and analyzed as they pertain to the Plan.

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

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

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

**Table 2-3. Examples of Methods of Incorporation**

Planning Mechanism	Incorporation of Plan
Grant Applications	The Plan will be evaluated by the City of Weslaco when grant funding is sought for mitigation projects. If a project is not in the Plan, an amendment may be necessary to include the action in the Plan.
Annual Budget Review	Various departments and key personnel that participated in the planning process for the City of Weslaco will review the Plan and mitigation actions therein when conducting their annual budget review. Allowances will be made in accordance with grant applications sought and mitigation actions that will be undertaken per the implementation schedule of the specific action.
Regulatory Plans	Currently, the City of Weslaco have regulatory plans in place, such as Emergency Management Plans, Continuity of Operations Plans, Land Use Plans, and Evacuation Plans. The Plan will be consulted when City departments review or revise their current regulatory planning mechanisms or in the development of regulatory plans that are not currently in place.
Capital Improvement Plans	The City of Weslaco has a Capital Improvement Plan (CIP) in place. Prior to any revisions to the CIP, City departments will review the risk assessment and mitigation strategy sections of the HMAP, as limiting public spending in hazardous zones is one of the most effective long-term mitigation actions available to local governments.
Floodplain Management Plans	Floodplain management plans include preventative and corrective actions to address the flood hazard. Therefore, the actions for flooding and information found in Section 5 of this Plan discussing the people

## SECTION 2: PLANNING PROCESS

Planning Mechanism	Incorporation of Plan
	and property at risk to flood will be reviewed and revised when the City of Weslaco updates their management plans or develops new plans.

Appendix E provides an overview of Planning Team members’ existing planning and regulatory capabilities to support implementation of mitigation strategy objectives. Appendix E also provides further analysis of how each jurisdiction intends to incorporate hazard mitigation actions into existing plans, policies, and the annual budget review as it pertains to prioritizing grant applications for funding and implementation of identified hazard mitigation projects.

It should be noted for the purposes of the plan that the HMAP has been used as a reference when reviewing and updating all plans and ordinances for the City of Weslaco. The Emergency Management Plan, which provides strategic guidance for city departments, is updated every 5 years and incorporates goals, objectives and actions identified in the current mitigation plan.

### PLAN REVIEW AND PLAN UPDATE

For the development of the Plan, the City of Weslaco will oversee the review and update process for relevance and to make necessary adjustments. At the beginning of each fiscal year, Planning Team Members will meet to evaluate the Plan and review other planning mechanisms to ensure consistency with long-range planning efforts. In addition, planning participants will also meet twice a year by conference call or presentation to re-evaluate prioritization of the hazard mitigation actions and the hazard assessment.

### TIMELINE FOR IMPLEMENTING MITIGATION ACTIONS

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

The Executive Planning Team will evaluate and prioritize the most suitable hazard mitigation actions for the community to implement. The timeline for implementation of actions will partially be directed by the City of Weslaco’s comprehensive planning process, budgetary constraints, and community needs. The City committed to addressing and implementing hazard mitigation actions that may be aligned with and integrated into the Plan.

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

### PUBLIC AND STAKEHOLDER INVOLVEMENT

An important component of hazard mitigation planning is public participation and stakeholder involvement. Input from individual citizens and the community as a whole provides the Planning

## SECTION 2: PLANNING PROCESS

Team with a greater understanding of local concerns and increases the likelihood of successfully implemented hazard mitigation actions. If citizens and stakeholders such as local businesses, non-profits, hospitals, and schools are involved, they are more likely to gain a greater appreciation of the risks that hazards may present in their community and take steps to reduce or mitigate their impact.

The public was involved in the development of the City of Weslaco's 2020 Plan at different stages prior to official Plan approval and adoption. Public input was sought using three methods: (1) open public meetings; (2) survey instruments; and (3) making the draft Plan available for public review at the City of Weslaco's website.

The draft 2020 Plan was made available to the general public for review and comment on the City of Weslaco website. The public was notified at the public meetings and via social media posts that the draft Plan would be available for review online. Feedback was received from the public survey and on the draft 2020 Plan available on the City of Weslaco website, and all relevant information was incorporated into the Plan. Information that was obtained from the survey assisted in determining the community's concern about risk which drove the focus of the plan on areas of concern and assisted in the development of mitigation actions.

The 2020 Plan will be advertised and posted on the City of Weslaco's website upon approval from FEMA and a copy will be kept at City Hall.

### STAKEHOLDER INVOLVEMENT

Stakeholder involvement is essential to hazard mitigation planning since a wide range of stakeholders can provide input on specific topics and input from various points of view. Throughout the planning process, members of community groups, local businesses, neighboring jurisdictions, schools, and hospitals were invited to participate in the development of the 2020 Plan. The Stakeholder Group (Appendix A, Table A-3, and Table 2-4, below), included a broad range of representatives from both the public and private sector and served as a key component in the City of Weslaco's outreach efforts for development of the Plan. Documentation of stakeholder meetings is found in Appendix E. A list of organizations invited to attend via e-mail is found in Table 2-4.

**Table 2-4. Stakeholder Working Group**

AGENCY	TITLE	PARTICIPATED
911 Center	Public Safety Director	
AEP	Manager, External Affairs	
City of McAllen	WWCS Manager	X
Economic Development Corporation of Weslaco	Executive Director	
First Baptist Church	Senior Pastor	
HEB North Texas / Westgate / Distribution Warehouse	Public Affairs Specialist	
Hidalgo County	Chief/Emergency Management Coordinator	

## SECTION 2: PLANNING PROCESS

AGENCY	TITLE	PARTICIPATED
Knapp Medical Center	Trauma Center Coordinator	
South Texas Health Systems	Emergency Preparedness Coordinator	
Texas House District 39	Representative	
Texas Senate District 27	Senator	
University of Texas Rio Grande Valley	Emergency Management Coordinator	
Valley Baptist Medical Center	Business Development	
Weslaco Independent School District	Employee Benefits Risk Management Director	

Stakeholders and participants from neighboring communities that attended the Planning Team and public meetings played a key role in the planning process. For example, flooding and thunderstorm wind were major concerns to the stakeholders, so the City of Weslaco included mitigation actions, such as structural drainage improvements and hardening critical facilities to protect them from hazardous events.

### PUBLIC MEETINGS

A series of public meetings were held throughout the planning area to collect public and stakeholder input. Topics of discussion included the purpose of hazard mitigation, discussion of the planning process, and types of natural hazards. Representatives from area neighborhood associations and area residents were invited to participate. Additionally, the City of Weslaco utilized social media sources including Facebook, Twitter, and the local media to increase public participation in the Plan development process. Documentation on the public meetings can be found in Appendix D.

Public meetings were held on the following dates and locations:

- February 20, 2020 – Weslaco City Hall
- May 28, 2020 – Adobe Connect Webinar

### PUBLIC PARTICIPATION SURVEY

In addition to public meetings, the Planning and Consultant Teams developed a public survey designed to solicit public input during the planning process from citizens and stakeholders, and to obtain data regarding the identification of any potential hazard mitigation actions or problem areas. The survey was promoted by local officials and a link to the survey was posted on the City of Weslaco's website. A total of 3 surveys were completed online and the results are analyzed in Appendix B. The City of Weslaco reviewed the input from the surveys and decided which information to incorporate into the Plan as hazard mitigation actions. For example, one citizen requested preventive maintenance program throughout the year and not just at the beginning of hurricane season as a potential action. In response to public input, an action was included to implement an education and awareness program to provide mitigation measures to reduce injuries, fatalities and property damage.

# SECTION 3: CITY PROFILE

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- Population and Demographics ..... 4
  - Population Growth ..... 4
- Future Development ..... 4
- Economic Impact ..... 5
- Existing and Future Land Use and Development Trends ..... 5

## OVERVIEW

W.E. Stewart, who owned a land company in Kansas City, Missouri, purchased a large land tract where he built a clubhouse on Llano Grande Lake to house parties and entertain potential buyers of the uncleared, brush-covered farmland. In September of 1919, four men approached Stewart and offered to purchase some of his land for a town site. Three brothers Ed C. Couch, Dan R. and R.C. Couch and a brother-in-law, R.L. Reeves purchased 320 acres of the West Tract Subdivision for \$250,000. Two of the brothers changed their minds about the town, but the two remaining men stayed and founded what is today known as the City of Weslaco.

Ed C. Couch and R.L. Reeves held an all-day auction that would sell residential and business lots ranging from \$50 to \$400 a lot. To make a claim, individuals had to choose a lot and camp on it until the day of the sale. Lots were given away free to church groups. Flyers were posted in nearby communities and the gentlemen gave away three automobiles during the auction to attract settlers. The founders had already reserved the land that would be occupied by churches, parks, schools and the city hall. The town became a settled community almost overnight.



Weslaco Independent School District formed in 1921, when residents petitioned the Texas Legislature to separate from Donna ISD. Upon the district’s creation, board members planned for the first school building, designed by San Antonio architect Harvey P. Smith and completed by Brownsville’s H.L. Fitch and Co. by February 1923.

The Rio Grande Valley Citrus Growers Association was established in 1932 with its headquarters located in Weslaco. This led to the creation of the Texsun citrus complex in the city. Texsun became the world’s largest producer of juice and remained a vital part of the economy in Weslaco until 1992.

Figure 3-1 shows the general location of the City of Weslaco relative to other area communities within and adjacent to Hidalgo County.

## SECTION 3: CITY PROFILE

**Figure 3-1. Location of City of Weslaco Planning Area**

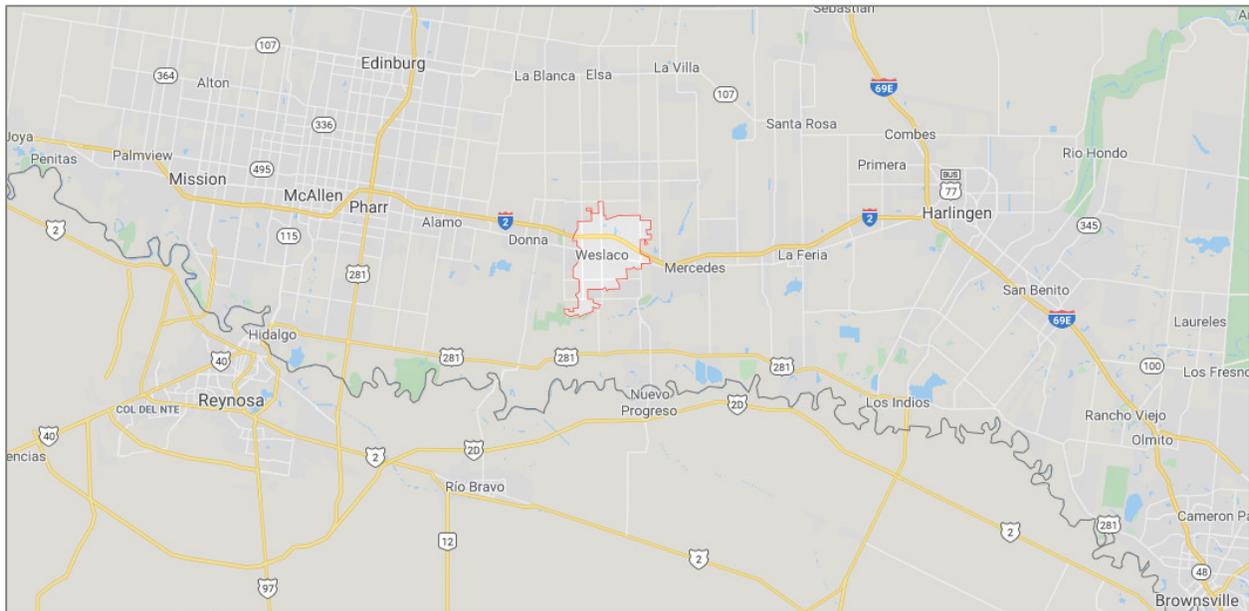
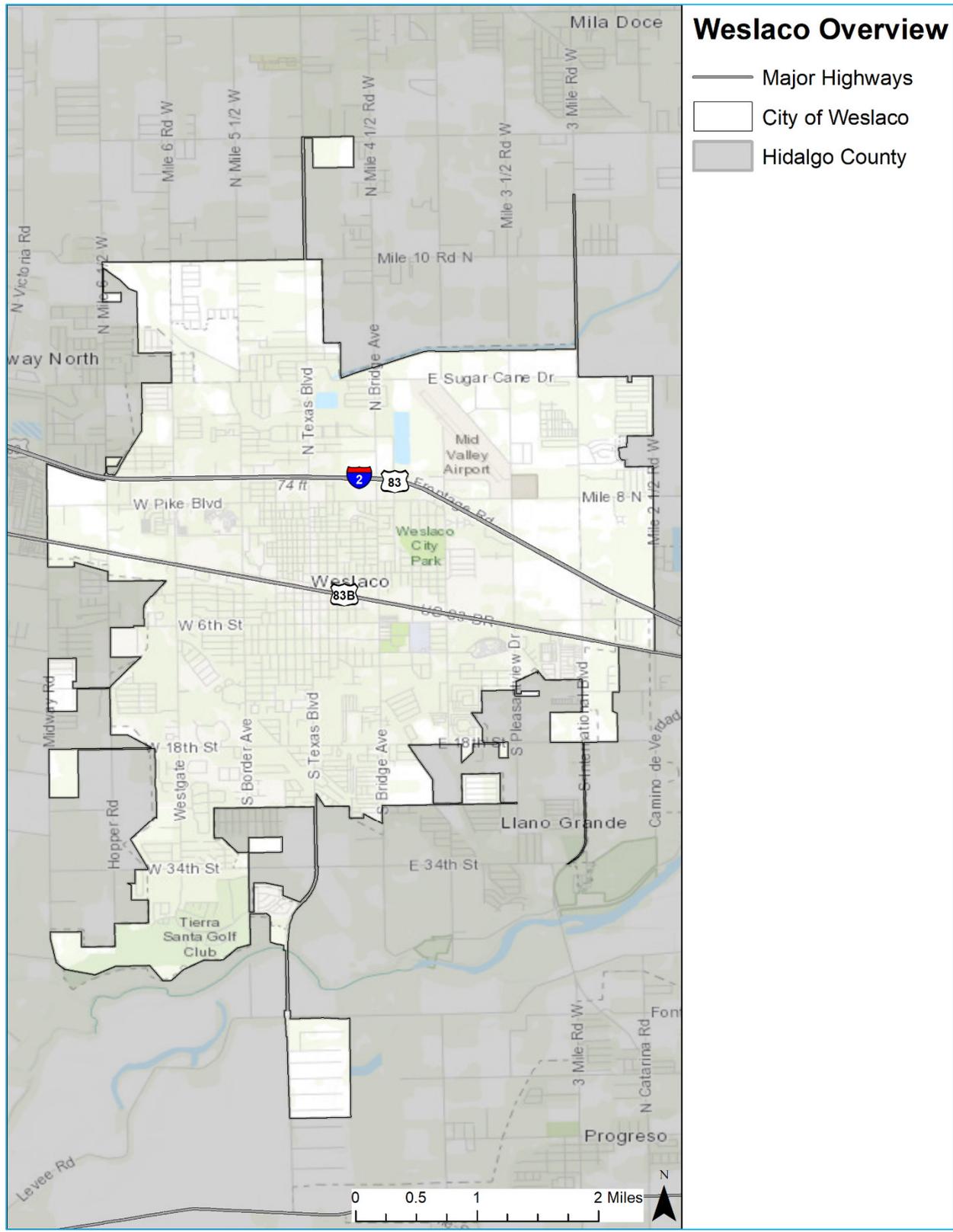


Figure 3-2 shows the city limits of the City of Weslaco, which makes up the planning area. All areas of the City's corporate limits are covered in the risk assessment analysis of the Plan.

# SECTION 3: CITY PROFILE

## Figure 3-2. City of Weslaco Planning Area



## SECTION 3: CITY PROFILE

### POPULATION AND DEMOGRAPHICS

In the official Census population count, as of April 1, 2010, Weslaco had a population of 35,670 residents. By 2018, the number was estimated at 39,871. Table 3-1 highlights the vulnerable or sensitive populations in the City of Weslaco.<sup>1</sup>

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

**Table 3-1. Population Distribution for the City of Weslaco**

TOTAL 2010 POPULATION	2018 POPULATION ESTIMATE	ESTIMATED VULNERABLE OR SENSITIVE POPULATIONS <sup>2</sup>		
		Youth (Under 5)	Elderly (Over 65)	Below Poverty Level
35,670	39,871	4,302	5,643	10,087

### POPULATION GROWTH

The official 2010 Weslaco population is 35,670. Overall, Weslaco experienced an increase in population between 1980 and 2010 by 84.5 percent, or an increase by 16,339 people. The City continued to have population growth between 2000 and 2010 by 32.4 percent, or 8,735 people. Table 3-2 provides historic growth rates in the City of Weslaco. A larger population means an increase in vulnerability and a growth in vulnerable populations, as well.

**Table 3-2. Population for the City of Weslaco, 1980-2010**

1980	1990	2000	2010	POP CHANGE 1980-2010	PERCENT OF CHANGE	POP CHANGE 2000-2010	PERCENT OF CHANGE
19,331	21,877	26,935	35,670	16,339	84.5%	8,735	32.4%

### FUTURE DEVELOPMENT

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

Population projections from 2010 to 2040 are listed in Table 3-3, as provided by the Office of the State Demographer, Texas State Data Center, and the Institute for Demographic and Socioeconomic Research. Population projections are based on a 0.5 scenario growth rate, which is 50 percent of the population growth rate that occurred during 2000-2010. This information is

<sup>1</sup> Source: <https://www.census.gov/quickfacts/fact/table/weslacocitytexas/PST120218> and <https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/2018/>

<sup>2</sup> The Estimated Vulnerable or Sensitive Populations are based off the 2018 American Community Survey.

## SECTION 3: CITY PROFILE

only available at the County level; however, the population projection shows an increase in population density for the County, which would mean overall growth for the City of Weslaco.

**Table 3-3. Hidalgo County Population Projections**

County	LAND AREA (SQ MI)	2010		2020		2030		2040	
		Population							
		Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)	Total Number	Density (Land Area, SQ MI)
Hidalgo	1,571	774,769	493.2	948,305	603.6	1,145,413	729.1	1,345,740	856.6

### ECONOMIC IMPACT

Building and maintaining infrastructure depends on the economy, and therefore, protecting infrastructure from risk due to natural hazards is important to the City of Weslaco. Whether it's expanding culverts under a road that washes out during flash flooding, shuttering a fire station, or flood-proofing a wastewater facility, infrastructure must be mitigated from natural hazards in order to continue providing essential utility and emergency response services in a fast-growing planning area.

The Weslaco Area Chamber of Commerce was established in 1935 as a business organization consisting of local businesses, organizations, professionals and individuals. Their mission statement is together, with their partners, they will provide leadership to advance a prosperous economy that enhances the quality of life in the community.

### EXISTING AND FUTURE LAND USE AND DEVELOPMENT TRENDS

The Planning & Code Enforcement Department of Weslaco leads the City's development efforts for orderly and responsible growth. The department ensures compliance with ordinances and regulations.

The Planning Division manages a broad scope of programs and activities ranging from annexation for future development to shaping neighborhoods and communities to promoting redevelopment. Their goals are business growth, create jobs and establish and maintain a healthy business environment in Weslaco. The City reaches these goals by efficiently and effectively providing direct services to local businesses, residents, visitors and development and construction community, including planning and land development, building permitting, inspection and safety, business licensing, special event permitting, and pre-development consultation assistance.

In partnership with the citizens, the Parks and Recreation Department is dedicated to enriching the quality of life for present and future generations of Weslaco residents.

# SECTION 4: RISK OVERVIEW

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 Overview of Hazard Analysis ..... 4

## HAZARD DESCRIPTION

Section 4 is the first phase of the Risk Assessment and provides background information for the hazard identification process and descriptions for the hazards identified. The Risk Assessment continues with Sections 5 through 15, which include hazard descriptions and vulnerability assessments.

Upon a review of the full range of natural hazards suggested under the Federal Emergency Management Agency (FEMA) planning guidance, the City of Weslaco identified 11 natural hazards that are addressed in the 2020 Hazard Mitigation Plan. Of the hazards identified, 11 natural hazards were identified as significant, as shown in Table 4-1. The hazards were identified through input from Planning Team members and a review of the current 2018 State of Texas Hazard Mitigation Plan Update (State Plan Update). Readily available online information from reputable sources, such as federal and state agencies, were also evaluated and utilized to supplement information as needed.

In general, there are 3 main categories of hazards including: atmospheric, hydrologic, and technological. Atmospheric hazards are events or incidents associated with weather generated phenomenon. Atmospheric hazards that have been identified as significant for the Weslaco Planning area include: extreme heat, hail, hurricane wind, lightning, thunderstorm wind, tornado, and winter storm (Table 4-1).

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

For the Risk Assessment, the wildfire and expansive soils hazards are considered “other,” since a wildfire may be natural or human-caused and is not considered atmospheric or hydrologic.

**Table 4-1. Descriptions**

HAZARD	DESCRIPTION
<b>ATMOSPHERIC</b>	
<b>Extreme Heat</b>	Extreme heat is the condition whereby temperatures hover 10 degrees or more above the average high temperature in a region for an extended period of time.

## SECTION 4: RISK OVERVIEW

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

## SECTION 4: RISK OVERVIEW

HAZARD	DESCRIPTION
<b>Flood</b>	The accumulation of water within a body of water, which results in the overflow of excess water onto adjacent lands, usually floodplains. The floodplain is the land adjoining the channel of a river, stream, ocean, lake, or other watercourse or water body that is susceptible to flooding. Most floods fall into the following three categories: riverine flooding, coastal flooding, and shallow flooding.
<b>OTHER</b>	
<b>Expansive Soils</b>	Expansive soils are soils and soft rock that tend to swell or shrink due to changes in moisture content. Changes in soil volume present a hazard primarily to structures built on top of expansive soils.
<b>Wildfire</b>	A wildfire is an uncontrolled fire burning in an area of vegetative fuels such as grasslands, brush, or woodlands. Heavier fuels with high continuity, steep slopes, high temperatures, low humidity, low rainfall, and high winds all work to increase the risk for people and property located within wildfire hazard areas or along the urban/wildland interface. Wildfires are part of the natural management of forest ecosystems, but most are caused by human factors.

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

**Table 4-2. Hazard Identification Process**

HAZARD CONSIDERED	REASON FOR DETERMINATION
<b>Coastal Erosion</b>	The planning area is not located on the coast, therefore coastal erosion does not pose a risk.
<b>Dam Failure</b>	There are no dams located in or near the planning area that pose a risk should a failure occur.
<b>Earthquakes</b>	According to the State Plan, an earthquake occurrence for the planning area is considered exceedingly rare. Earthquake events are not considered to pose a risk to the planning area. There is no history of impact to critical structures, systems, populations or other community assets or vital services as a result of earthquakes and impact is not expected in the future.

## SECTION 4: RISK OVERVIEW

HAZARD CONSIDERED	REASON FOR DETERMINATION
<b>Land Subsidence</b>	There are no historical occurrences of land subsidence for the planning area and it is located in an area where occurrences are considered rare. There is no history of impact to critical structures, systems, populations, or other community assets or vital services as a result of land subsidence and impact is not expected in the future.

### NATURAL HAZARDS AND CLIMATE CHANGE

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

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

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

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

### OVERVIEW OF HAZARD ANALYSIS

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

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

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

The 4 general parameters that are described for each hazard in the Risk Assessment include frequency of return, approximate annualized losses, a description of general vulnerability, and a statement of the hazard's impact.

## SECTION 4: RISK OVERVIEW

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

**Table 4-3. Frequency of Return Statements**

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

**Table 4-4. Impact Statements**

POTENTIAL SEVERITY	DESCRIPTION
<b>Substantial</b>	Multiple deaths. Complete shutdown of facilities for 30 days or more. More than 50 percent of property destroyed or with major damage.
<b>Major</b>	Injuries and illnesses resulting in permanent disability. Complete shutdown of critical facilities for at least 2 weeks. More than 25 percent of property destroyed or with major damage.
<b>Minor</b>	Injuries and illnesses do not result in permanent disability. Complete shutdown of critical facilities for more than 1 week. More than 10 percent of property destroyed or with major damage.
<b>Limited</b>	Injuries and illnesses are treatable with first aid. Shutdown of critical facilities and services for 24 hours or less. Less than 10 percent of property destroyed or with major damage.

Each of the hazard profiles includes a description of a general Vulnerability Assessment. Vulnerability is the total of assets that are subject to damages from a hazard, based on historic recorded damages. Assets in the region were inventoried and defined in hazard zones where appropriate. The total amount of damages, including property and crop damages, for each hazard is divided by the total number of assets (building value totals) in that community to determine the percentage of damage that each hazard can cause to the community.

To better understand how future growth and development in the City might affect hazard vulnerability, it is useful to consider population growth, occupied and vacant land, the potential for future development in hazard areas, and current planning and growth management efforts. Hazard vulnerability for the City of Weslaco was reviewed based on recent development changes that occurred throughout the planning area. The City of Weslaco grew by 12 percent between 2010 and 2018 according to the U.S. Census Bureau, therefore the vulnerability to the population,

## SECTION 4: RISK OVERVIEW

infrastructure, and buildings has increased for hazards that do not have a geographical boundary. The City of Weslaco has participated in multiple activities to reduce flood losses and protect citizens and property. The City participates in the National Flood Insurance Program and regulations apply for buildings in the 25 year and 100 year floodplains. Therefore, vulnerability has not increased for flood.

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

# SECTION 5: FLOOD

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Probability of Future Events ..... 8

Vulnerability and Impact ..... 8

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NFIP Compliance and Maintenance ..... 12

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## HAZARD DESCRIPTION

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

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

## LOCATION

The Flood Insurance Rate Map (FIRM) data provided by FEMA for the City of Weslaco shows the following flood hazard areas:

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

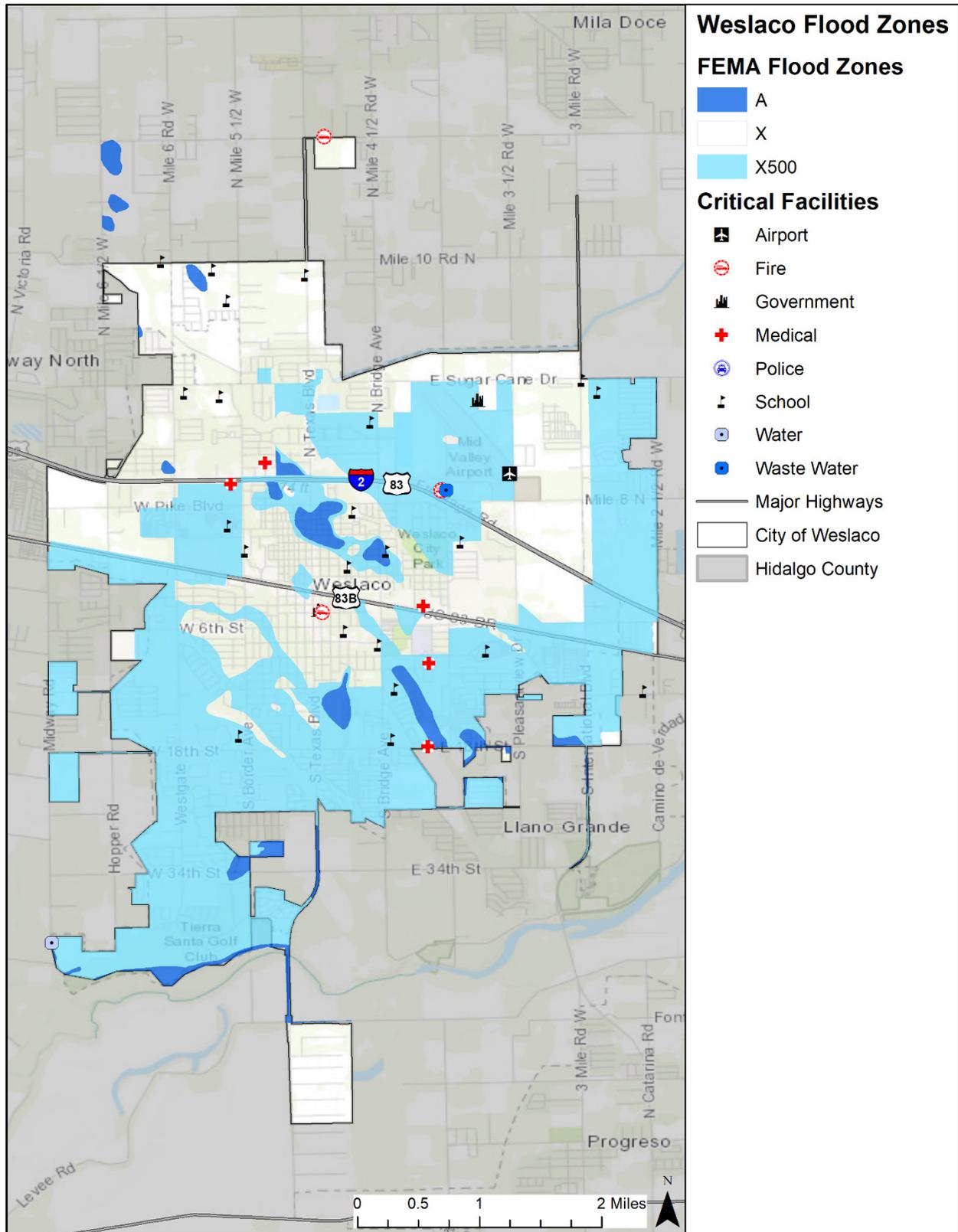
## SECTION 5: FLOOD

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

Locations of flood zones in the City of Weslaco are based on the Digital Flood Insurance Rate Map (DFIRM) from FEMA are detailed below (Figure 5-1).

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**Figure 5-1. Estimated Flood Zones in the City of Weslaco**



## SECTION 5: FLOOD

### EXTENT

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

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

**Table 5-1. Flood Zones**

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

## SECTION 5: FLOOD

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

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

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

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

**Table 5-2. Extent for the City of Weslaco<sup>1</sup>**

JURISDICTION <sup>2</sup>	PEAK FLOOD EVENT
Hidalgo County	The Rio Grande River near Progreso, Texas (5 miles south of Weslaco) reached an overflow elevation of 76.35 feet in October 1972. The average peak flow for the Rio Grande is 33.43 feet at this site.

<sup>1</sup> Severity estimated by averaging floods at certain stage level over the history of flood events. Severity and peak events are based on U.S. Geological Survey data.

<sup>2</sup> Severity is provided where peak data was provided.

## SECTION 5: FLOOD

The range of flood intensity that the planning area can experience is high, or Zone A. Based on historical occurrences, the planning area, including all participating jurisdictions could expect to experience up to 5.8 inches of rainfall within a 3-hour period, resulting in flash flooding.

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

### HISTORICAL OCCURRENCES

Historical evidence indicates that areas within the planning area are susceptible to flooding, especially in the form of flash flooding. It is important to note that only flood events that have been reported have been factored into this risk assessment, therefore it is likely that additional flood occurrences have gone unreported before and during the recording period. Table 5-3 identifies historical flood events within the City of Weslaco planning area. Historical data is provided by the Storm Prediction Center (NOAA), NCEI database for the City of Weslaco.

**Table 5-3. Historical Flood Events, 1996-2019<sup>3</sup>**

JURISDICTION	DATE	TIME	DEATHS	INJURIES	PROPERTY DAMAGE <sup>4</sup>	CROP DAMAGE
Hidalgo County	8/23/1999	11:00 AM	0	0	\$29	\$0
City of Weslaco	9/17/2003	3:15 PM	0	0	\$104,470	\$0
Hidalgo County	9/19/2003	6:00 PM	0	0	\$5,182	\$0
Hidalgo County	10/13/2003	9:00 AM	0	0	\$116,714	\$0
City of Weslaco	9/24/2006	10:00 AM	0	0	\$63,571	\$0
Hidalgo County	5/25/2007	3:19 PM	0	0	\$577	\$0
Hidalgo County	7/16/2007	8:05 AM	0	0	\$9,479	\$0
Hidalgo County	7/23/2008	4:00 PM	0	0	\$311	\$109,069
Hidalgo County	7/24/2008	6:01 AM	0	0	\$311	\$1,090,692
Hidalgo County	8/23/2008	5:15 PM	0	0	\$11	\$0
Hidalgo County	4/17/2010	6:30 PM	0	0	\$1,100	\$0
Hidalgo County	5/18/2010	7:45 AM	0	0	\$165	\$0

<sup>3</sup> Values are in 2020 dollars. Historical events are listed from January 1996 through November 2019. Only events with reported injuries, fatalities, property damages, or crop damages were listed.

<sup>4</sup> Countywide damages have been adjusted to reflect only a percentage (0.93%) of the damages attributed to the City of Weslaco.

## SECTION 5: FLOOD

JURISDICTION	DATE	TIME	DEATHS	INJURIES	PROPERTY DAMAGE <sup>4</sup>	CROP DAMAGE
Hidalgo County	6/7/2010	4:15 PM	0	0	\$165	\$0
Hidalgo County	6/30/2010	6:00 PM	0	0	\$1,101	\$108,969
Hidalgo County	7/1/2010	12:00 AM	0	0	\$6	\$0
Hidalgo County	7/9/2010	6:30 AM	0	0	\$70,980	\$16,507
Hidalgo County	7/10/2010	6:30 AM	0	0	\$70,430	\$5,502
Hidalgo County	7/12/2010	6:30 AM	0	0	\$70,980	\$143,060
Hidalgo County	8/1/2010	12:00 AM	1	0	\$0	\$0
City of Weslaco	6/23/2011	1:45 PM	0	0	\$28,572	\$0
Hidalgo County	3/29/2012	8:55 PM	0	0	\$52,293	\$0
Hidalgo County	4/10/2015	6:00 PM	0	0	\$101	\$0
Hidalgo County	5/11/2015	9:00 PM	0	0	\$20,177	\$0
Hidalgo County	5/15/2015	2:00 PM	0	0	\$202	\$0
Hidalgo County	6/17/2015	11:30 PM	0	0	\$20,107	\$0
Hidalgo County	6/19/2015	4:30 PM	0	0	\$231,229	\$0
Hidalgo County	10/24/2015	1:00 PM	0	0	\$504,362	\$0
Hidalgo County	11/1/2015	12:00 AM	0	0	\$253	\$0
Hidalgo County	10/10/2017	2:00 PM	0	0	\$195	\$0
City of Weslaco	10/10/2017	2:00 PM	0	0	\$15,688	\$0
Hidalgo County	6/20/2018	3:15 AM	0	0	\$238,019	\$0
Hidalgo County	6/20/2018	3:30 AM	0	0	\$38,083	\$0
Hidalgo County	6/21/2018	6:00 AM	0	0	\$199,936	\$0
Hidalgo County	6/22/2018	3:00 AM	0	0	\$9,521	\$0
Hidalgo County	5/14/2019	12:00 PM	0	0	\$47	\$0
City of Weslaco	6/24/2019	8:00 PM	0	0	\$30,214,099	\$1,007,137
<b>TOTALS</b>			<b>1</b>	<b>0</b>	<b>\$32,088,465</b>	<b>\$2,480,937</b>

## SECTION 5: FLOOD

**Table 5-4. Summary of Historical Flood Events, January 1996-2019**

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
City of Weslaco	11	0	0	\$30,426,400	\$1,007,137
Hidalgo County	59	1	0	\$1,662,065	\$1,473,800
<b>TOTAL LOSSES</b>	<b>70</b>	<b>1</b>	<b>0</b>	<b>\$34,569,402</b>	

### SIGNIFICANT EVENTS

#### Flash Flood- July-August, 2010

On August 3rd, President Obama declared most counties in the Rio Grande Valley a Major Disaster, eligible for federal funding to assist with the longer-term recovery. Property and Crop damages from the flood may ultimately total well over \$50 million when all assessments are completed. Property damage estimates in Hidalgo County had reached \$22 million. Crops planted in flood zones were destroyed by the long duration of nutrient rich waters. Note: final damage cost estimated are provided in the July Storm Data report.

#### Flash Flood - October 24, 2015

After hours of rainfall, the flooding became a flash flood. Several inches to at least a foot of water rose into homes in the Las Brisas subdivision on the east side of town, with three to five feet of water on neighborhood streets. At least three feet of water submerged vehicles along the frontage roads between the Westgate and Airport Road exits during the peak of the flash flooding. Additional high water closed portions of FM 1015 between Weslaco and Progreso (which also had flash flooding of unknown depth) and FM 493 near Donna. At least 26 separate boat rescues were made in flooded neighborhoods and more than 500 homes were impacted by some level of floodwater.

### PROBABILITY OF FUTURE EVENTS

Due to the limited number of events reported for the City of Weslaco, the analysis focused on the reported events for Hidalgo County to reflect a greater probability for the planning area. This more accurately depicts the risk for the planning area based on the planning team and stakeholder accounts. Based on 70 recorded historical occurrences within a 24-year reporting period within the City of Weslaco planning area, flooding is likely with 2 to 3 events anticipated every year.

### VULNERABILITY AND IMPACT

A property's vulnerability to a flood depends on its location and proximity to the floodplain. Structures that lie along banks of a waterway are the most vulnerable and are often repetitive loss structures. The City of Weslaco encourages development outside of the floodplain, and the impact for flood for the entire planning area is "Minor" as facilities and services would be shut down for one week or more, more than 10 percent of property destroyed or with major damage, and injuries or illness that do not result in permanent disability.

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

## SECTION 5: FLOOD

**Table 5-5. Critical Facilities in the Floodplain**

JURISDICTION	CRITICAL FACILITIES
City of Weslaco	1 Airport, 1 Police Station, 1 Fire Station, 3 Medical Facilities, 8 Schools, 1 College, 1 Public Works Department, 2 Water/Wastewater Treatment Facilities

Historic loss estimates due to flood are presented in Table 5-6 below. Considering 70 flood events over a 24-year period, frequency is approximately two to three events every year. It is anticipated that the City of Weslaco could anticipate an impact of “Limited” with critical facilities would be shut down for 24 hours or less and less than 10 percent of property would be destroyed or damaged

**Table 5-6. Potential Annualized Losses**

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
City of Weslaco	\$31,433,537	\$1,309,731
Hidalgo County	\$3,135,865	\$130,661
<b>TOTALS</b>	<b>\$34,569,402</b>	<b>\$1,440,392</b>

While all citizens are at risk to the impacts of a flood, forced relocation and disaster recovery drastically impacts low-income residents who lack the financial means to travel, afford a long-term stay away from home, and to rebuild or repair their homes. An estimated 26.1% of the planning area population live below the poverty level (Table 5-7).

**Table 5-7. Populations at Greatest Risk<sup>5</sup>**

JURISDICTION	POPULATION BELOW POVERTY LEVEL
City of Weslaco	10,289

### ASSESSMENT OF IMPACTS

Flooding is the deadliest natural disaster that occurs in the U.S. each year, and it poses a constant and significant threat to the health and safety of the people in the City of Weslaco planning area. The impact of climate change could produce larger, more severe flood events, exacerbating the current flood impacts. Worsening flood conditions can be frequently associated with a variety of impacts, including:

- Flood-related rescues may be necessary at swift and low water crossings or in flooded neighborhoods where roads have become impassable, placing first responders in harm’s way.

<sup>5</sup> US Census Bureau 2018 data for the City of Weslaco.

## SECTION 5: FLOOD

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

## SECTION 5: FLOOD

- Businesses that are uninsured or underinsured may have difficulty reopening, which results in a net loss of jobs for the community and a potential increase in the unemployment rate.
- Flooding may cause significant disruptions of clean water and sewer services, elevating health risks and delaying recovery efforts.
- The psycho-social effects on flood victims and their families can traumatize them for long periods of time, creating long term increases in medical treatment and services.
- Extensive or repetitive flooding can lead to decreases in property value for the affected community.
- Flood poses a potential catastrophic risk to annual and perennial crop production and overall crop quality leading to higher food costs.
- Flood related declines in production may lead to an increase in unemployment.
- Large floods may result in loss of livestock, potential increased livestock mortality due to stress and water borne disease, and increased cost for feed.

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

### NATIONAL FLOOD INSURANCE PROGRAM (NFIP) PARTICIPATION

Flood insurance offered through the National Flood Insurance Program (NFIP) is the best way for home and business owners to protect themselves financially against the flood hazard. The City of Weslaco is currently participating in the NFIP and is in good standing.

The City of Weslaco currently has in place minimum NFIP standards for new construction and substantial improvements of structures. The jurisdiction is considering adopting additional higher regulatory NFIP standards to limit floodplain development. The flood hazard areas throughout the planning area are subject to periodic inundation, which may result in loss of life and property, health and safety hazards, disruption of commerce and governmental services, and extraordinary public expenditures for flood protection and relief, of which adversely affect public safety.

These flood losses are created by the cumulative effect of obstructions in floodplains which cause an increase in flood heights and velocities, and by the occupancy of flood hazard areas by uses vulnerable to floods and hazardous to other lands because they are inadequately elevated, flood-proofed or otherwise protected from flood damage. Mitigation actions are included to address flood maintenance issues as well, including routinely clearing debris from drainage systems and bridges and expanding drainage culverts and storm water structures to more adequately convey flood waters.

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

## SECTION 5: FLOOD

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

In order to accomplish these tasks, the City of Weslaco seeks to follow these guidelines to achieve flood mitigation by:

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

## NFIP COMPLIANCE AND MAINTENANCE

As mentioned, the City of Weslaco has developed mitigation actions that relate to either NFIP maintenance or compliance. Compliance and maintenance actions can be found in Section 17.

Flooding was identified by the City of Weslaco as a high-risk hazard during hazard ranking activities at the Risk Assessment Workshop. As such, many of the mitigation actions were developed with flood mitigation in mind. A majority of these flood actions address compliance with the NFIP and implementing flood awareness programs. The City of Weslaco recognizes the need and are working towards adopting higher NFIP regulatory standards to further minimize flood risk in their community. In addition, the jurisdiction is focusing on public flood awareness activities. This includes promoting the availability of flood insurance by placing NFIP brochures and flyers in public libraries or public meeting places throughout the city.

The City of Weslaco has a designated floodplain administrator. The floodplain administrator in the planning area will continue to maintain compliance with the NFIP including continued floodplain administration, zoning ordinances, and development regulation. The floodplain ordinance adopted by the city outlines the minimum requirements for development in special flood hazard areas.

## SECTION 5: FLOOD

### REPETITIVE LOSS

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

Repetitive Loss properties are defined as structures that are:

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

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

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

In either scenario, at least two of the referenced claims must have occurred within any ten-year period and must be greater than 10 days apart.<sup>6</sup> Table 5-8 shows repetitive loss and severe repetitive loss properties for the City of Weslaco planning area.

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

JURISDICTION	BUILDING TYPE	NUMBER OF STRUCTURES	NUMBER OF LOSSES
City of Weslaco	Non-Residential	3	7
	Single Family	9	30

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<sup>6</sup> Source: Texas Water Development Board

# SECTION 6: HURRICANE WIND

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- Location ..... 1
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## HAZARD DESCRIPTION

Hurricanes often begin as tropical depressions that intensify into tropical storms when maximum sustained winds increase to between 35-64 knots (39-73 mph). At these wind speeds the storm becomes more organized and circular in shape and begins to resemble a hurricane. Tropical storms can be equally problematic without ever becoming a hurricane, resulting in heavy rainfall, high winds and tidal surge in coastal communities. When maximum sustained winds reach or exceed 39 mph, the system becomes a tropical storm. Once sustained winds reach or exceed 74 mph, the storm becomes a hurricane.

The intensity of a land falling hurricane is expressed in categories relating wind speeds and potential damage. Tropical storm-force winds are strong enough to be dangerous to those caught in them. For this reason, emergency managers plan to have evacuations completed and personnel sheltered before winds of tropical storm-force arrive, which precedes the arrival of hurricane-force winds.

According to the National Hurricane Center, the greatest potential for loss of life related to a hurricane is from storm surge. This happens when low pressure and high circular winds “pile” the water into a dome shape that can be 50-100 miles wide. The surge travels with the storm and is most severe on the right side of the storm, relative to the direction the storm travels. The surge can be 15 feet deep, topped by waves, and make landfall ahead of the center, or “eye”, of the hurricane. Wind-driven waves are superimposed on the storm tide. This rise in water level can cause severe flooding in coastal areas, particularly when the storm tide coincides with normal high tides.

Texas has some of the highest coastal erosion rates in the country, eroding at an average rate of 2.3 feet per year, according to the Texas General Land Office. Coastal erosion is caused by large storms, flooding, sea level rise, and human activities that wear away the beaches and bluffs along the ocean. Erosion can have long-term economic and social consequences.

## LOCATION

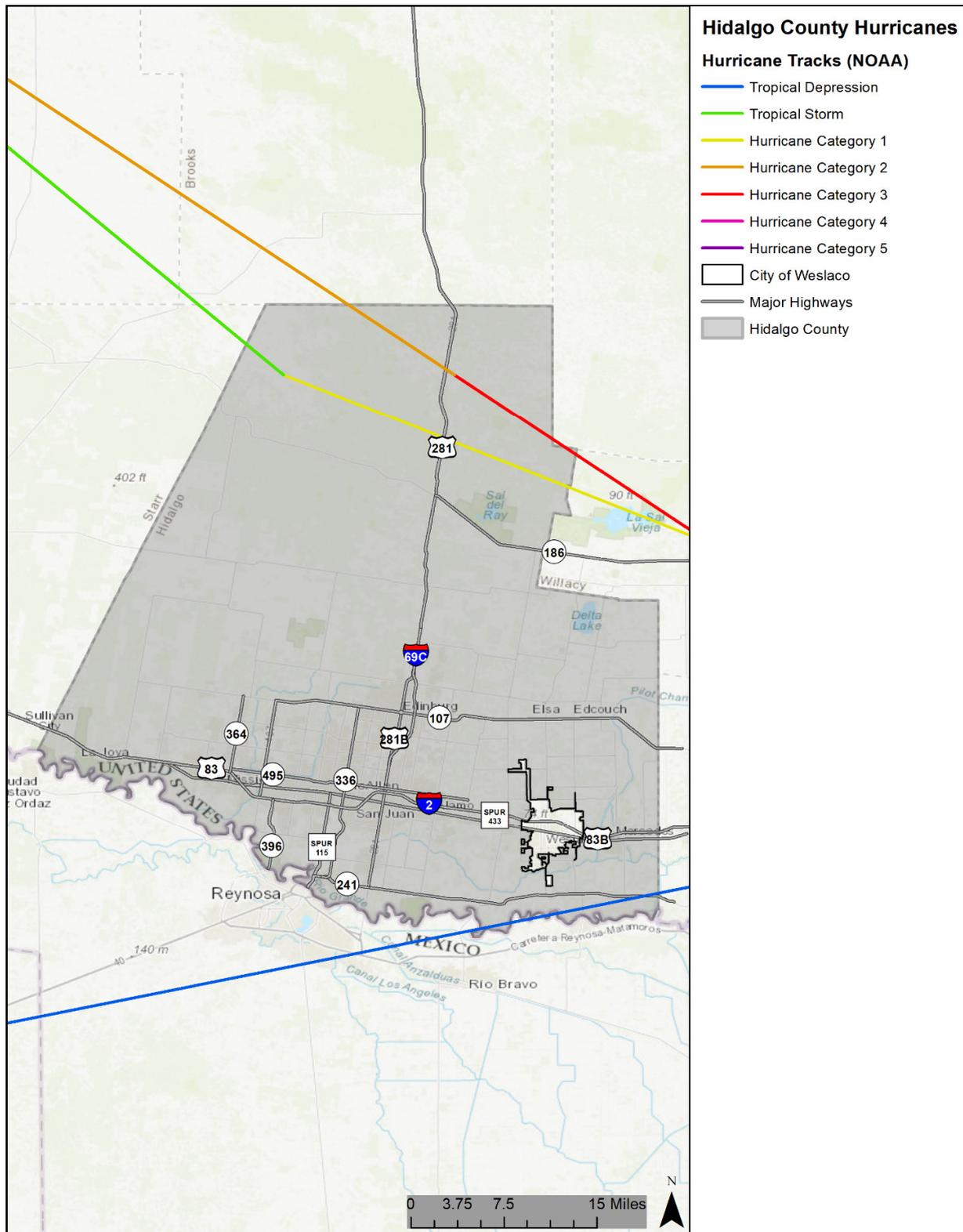
The City of Weslaco is vulnerable to threats directly and indirectly related to a hurricane event, such as high-force winds, storm surge, flooding, and coastal erosion. Hurricanes and/or tropical

## SECTION 6: HURRICANE WIND

storms can impact the City of Weslaco from June to November, the official Atlantic U.S. hurricane season. The City of Weslaco is in a moderate to high risk area for hurricane wind speeds of 110 to more than 155 miles per hour (mph). In Figure 6-1 below, hurricane tracks are reflective of their strength in the City of Weslaco planning area.

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Figure 6-1. Location of Historic Storm Tracks



## SECTION 6: HURRICANE WIND

### EXTENT

Hurricanes are categorized according to the strength and intensity of their winds using the Saffir-Simpson Hurricane Scale (See Table 6-1). A Category 1 storm has the lowest wind speeds, while a Category 5 hurricane has the highest. This scale only ranks wind speed, but lower category storms can inflict greater damage than higher category storms depending on where they strike, other weather they interact with and how slow they move.

**Table 6-1. Extent Scale for Hurricanes**

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

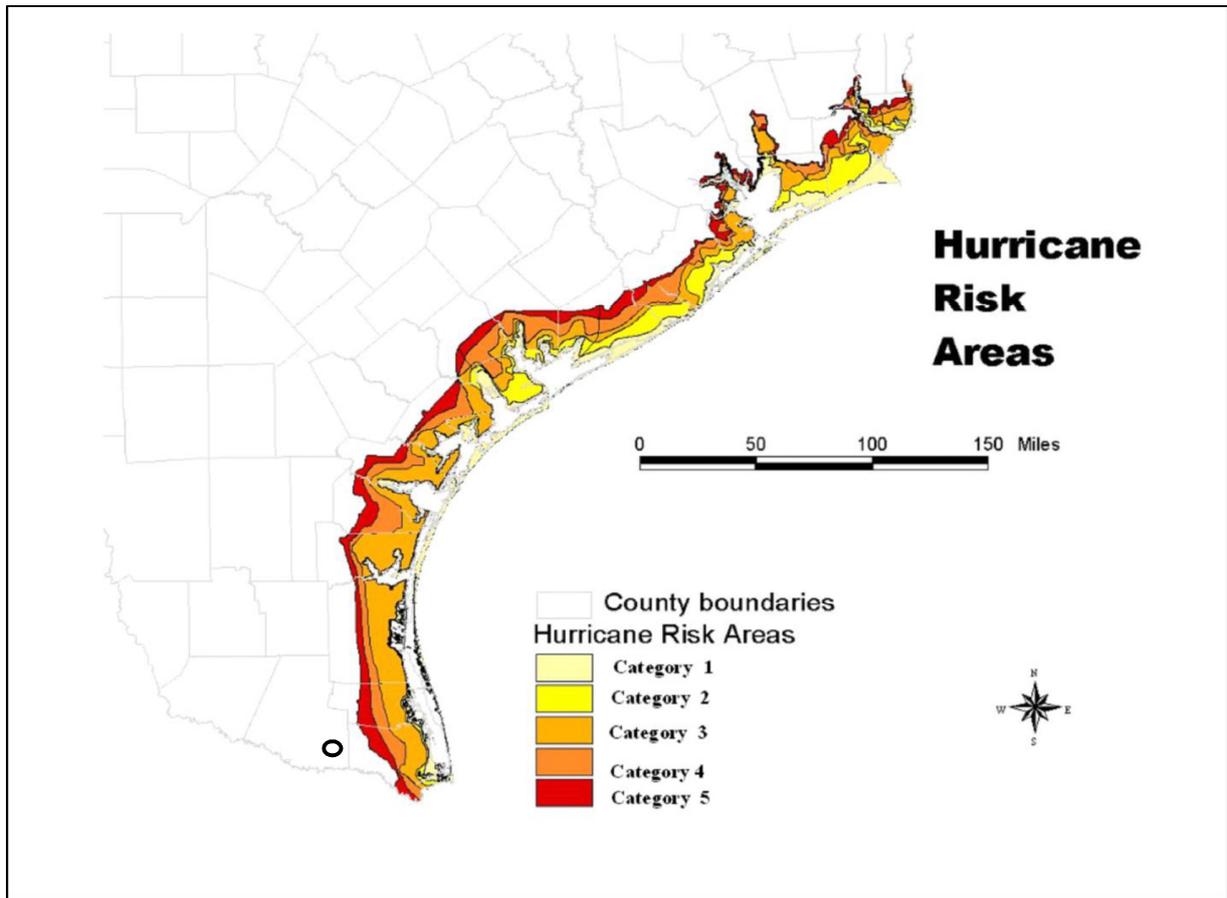
Based on the historical storm tracks for hurricanes and tropical storms, as well as the location of the City of Weslaco, the average extent to be mitigated for is a Category 5 storm. The City of Weslaco planning area is located in a low risk wind zone in terms of average wind speeds that should be mitigated in the event of a hurricane. This data is based on the design wind speeds for a 100-year event. The strongest hurricane to have impacted<sup>1</sup> the City of Weslaco planning area is a category 5 in 1971, 1980 and 2008. This is the strongest event the planning area can anticipate in the future. Figure 6-2 displays the location of hurricane risk by storm category along the Gulf Coast.

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<sup>1</sup> Impacted area may not include a direct hit of the eyewall of a hurricane or tropical storm.

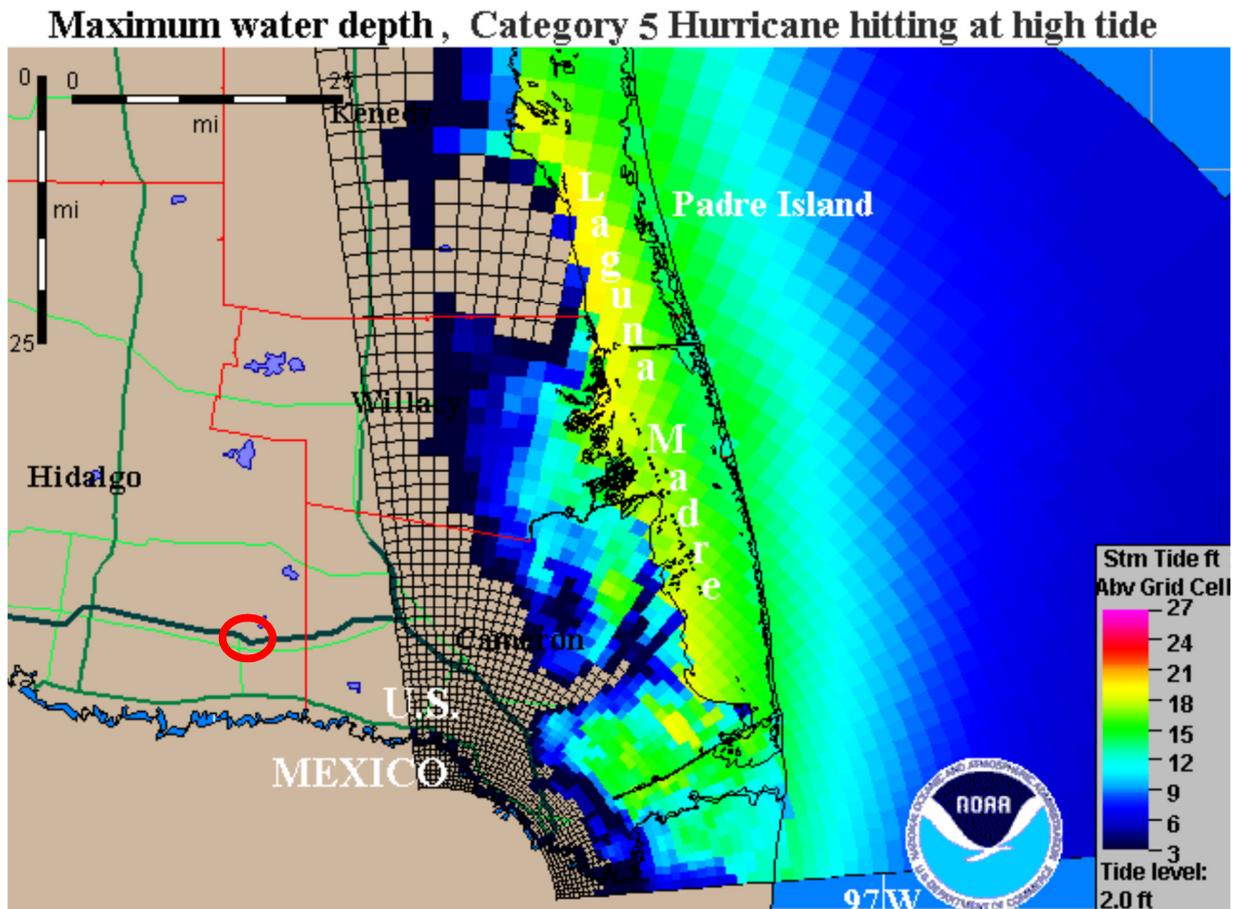
## SECTION 6: HURRICANE WIND

Figure 6-2. Location of Hurricane Risk along the Texas Coast



## SECTION 6: HURRICANE WIND

Figure 6-3. Maximum Storm Surge Water Depths, Category 5 Hurricane<sup>2</sup>



The planning area is located approximately 45 miles from the coast, and therefore has a greater risk, with all land and buildings being vulnerable to all storms, category 1 through 5.

### HISTORICAL OCCURRENCES

Previous occurrences include storms that had a direct path through the City of Weslaco planning area or were in close enough proximity to the City of Weslaco that risk to the planning area was elevated. Table 6-2 below lists the storms that have impacted the City of Weslaco planning area during the years of 1960-2019.

<sup>2</sup> Source: NOAA SLOSH (Sea, Lake, and Overland Surge from Hurricanes).

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**Table 6-2. Historical Hurricane Events for the City of Weslaco Planning Area, 1960-2019<sup>3</sup>**

JURISDICTION	DATE	MAGNITUDE	FATALITIES	INJURIES	PROPERTY DAMAGE <sup>4</sup>	CROP DAMAGE
Countywide	9/12/1961	Hurricane Carla	0	0	\$4,302,906	\$4,320,906
Countywide	9/20/1967	Hurricane Beulah	0	0	\$05,447,831	\$544,783
Countywide	7/22/1968	Hurricane Candy	0	0	\$0	\$0
Countywide	8/3/1970	Hurricane Celia	0	0	\$4,319,395	\$443,614
Countywide	9/5/1971	Hurricane Edith	0	0	\$5,518	\$5,518
Countywide	9/1/1973	Hurricane Delia	0	0	\$0	\$0
Countywide	7/31/1980	Hurricane Allen	0	0	\$16,444,219	\$1,644,422
Countywide	7/23/2008	Hurricane Dolly	0	0	\$2,065,771	\$0
Countywide	9/3/2010	Tropical Depression	0	0	\$0	\$0
<b>Total</b>					<b>\$39,544,883</b>	

### SIGNIFICANT EVENTS

#### **Hurricane Dolly on July 23, 2008**

The approach of Hurricane Dolly to the barrier shoreline of South Padre Island early on the morning of July 23rd brought sustained tropical storm force winds inland to the east side of Brownsville, including the Port, just before 7:30 AM on the 23rd. Prior rain bands had produced frequent gusts to 40 mph, but the arrival of sustained tropical storm winds was soon followed by wind damage and power outages, particularly during the afternoon. Prior to Dolly's landfall along the Cameron/Willacy County line, the western and southern eyewall intensified. The core of the eyewall traversed northern Cameron County, where impacts were more substantial than in southern Cameron County.

Northern Cameron (Harlingen, San Benito, Rio Hondo): A period of estimated and measured sustained winds between 60 and 70 mph, with frequent gusts to hurricane force (at least 78 mph measured at 2.25 meters), developed around 1 PM and continue through around 5 PM, beginning in northeast Cameron County near Arroyo City and extending west through Las Yescas, Rio Hondo, Harlingen, San Benito, Palm Valley, and La Feria, not only created widespread freshwater flooding, but created notable damage to poorly fastened roofs and some walls, particularly at industrial parks, strip centers, and farm buildings, especially from Harlingen to points east. Otherwise, numerous large limbs, power lines and power poles, highway signs and billboards, were blown down across the area during this time period. As Dolly's center eased slowly from

<sup>3</sup> Values are reported in 2020 dollars.

<sup>4</sup> Countywide damages have been adjusted to reflect only a percentage (0.93%) of the damages attributed to the City of Weslaco.

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southern Willacy into northern Hidalgo County, the last of the sustained tropical storm force winds began to exit Cameron County from Palm Valley to Santa Rosa and La Feria, just after midnight on the 24th.

Southern Cameron: Along and just north of the Rio Grande, from the Kellers Corner/Brownsville Airport area through Brownsville and to points west, roughly along federal highway 281 through Los Indios out toward the Hidalgo/Cameron County line, conditions were a bit more benign, as the core of the southern and western eyewall generally missed the area. Here, sustained tropical storm force winds persisted from around 8:30 AM until 6 PM, though gusts above 40 mph persisted until near midnight. In this area, sustained wind generally peaked between 45 and 55 mph, with peak gusts just below hurricane force between 11:30 AM and 2 PM. Here, damage was primarily to thousands of tree limbs, hundreds of power lines, and many elevated highway signs and billboards, but structural damage was primarily to unfastened shingles of roofs of moderate to well-constructed buildings, and occasional failures of more poorly constructed roofs at industrial parks and farm buildings.

At the peak of the storm, power was out to just about all of Cameron County, with an estimated 115,000 customers down during the middle of the afternoon. Across northern Cameron County, power recovery took days to more than a week, while many locations in southern Cameron County returned to power within a few days after Dolly's passage.

### PROBABILITY OF FUTURE EVENTS

Due to the location near the Gulf Coast, and the previous history of 9 events over a 60 year reporting period for the area, the likelihood or future probability of a tropical storm or hurricane in the City of Weslaco planning area is Occasional, meaning an event is probable in the next five years.

### VULNERABILITY AND IMPACT

Hurricane-force winds can cause major damage to large areas; hence all existing buildings, facilities and populations are equally exposed and vulnerable to this hazard and could potentially be impacted. Warning time for hurricanes has lengthened due to modern and early warning technology. Hurricane-force winds can easily destroy poorly constructed buildings and mobile homes, as well as debris such as signs, roofing materials, and small items left outside become extremely hazardous in hurricanes and tropical storms. Extensive damage to trees, towers, and underground utility lines (from uprooted trees) and fallen poles cause considerable civic disruption.

The City of Weslaco planning area features multiple mobile or manufactured home parks throughout the planning area. These parks are typically more vulnerable to tornado events than typical site-built structures. The US Census data indicates a total of 3,036 manufactured homes located in the City of Weslaco planning area (19.6%) (Table 6-3). In addition, 36% (approximately 5,597 structures) of the single family residential (SFR) structures in the entire planning area were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant tornado events.

## SECTION 6: HURRICANE WIND

**Table 6-3. Structures at Greater Risk**

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
City of Weslaco	3,234	5,428

The following critical facilities would be vulnerable to hurricane wind events in the City of Weslaco.

**Table 6-4. City of Weslaco Critical Facilities**

JURISDICTION	CRITICAL FACILITIES
City of Weslaco	1 Airport, 1 Police Station, 1 Government Facility, 4 Fire Stations, 5 Medical Facilities, 21 Schools, 1 College, 1 Public Works Department, 3 Water/Wastewater Treatment Facilities

Storm track data was available for the past 150 years; however, property and crop loss data is only available from 1960 to the present. Table 6-5 shows impact or loss estimation for storms impacting the planning area. Damages are reported on a countywide basis and are not available for individual jurisdictions. Annual loss estimates were based on the 60-year reporting period for such damages (Table 6-5). The average annual loss estimate for the City of Weslaco planning area is estimated at \$689,081.

**Table 6-5. Potential Annualized Losses City of Weslaco, 1960-2019**

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
City of Weslaco	\$39,544,883	\$689,081

The potential severity of impact from a hurricane for the City of Weslaco planning area is classified as “Minor”; injuries or illness do not result in permanent disability, complete shutdown of critical facilities and services for up to one week, and more than 10 percent of property would be destroyed or have major damage.

### ASSESSMENT OF IMPACTS

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

- Individuals exposed to the storm can be struck by flying debris, falling limbs, or downed trees causing serious injury or death.
- Structures can be damaged or crushed by falling trees, which can result in physical harm to the occupants.
- Driving conditions in the jurisdiction may be dangerous during a hurricane event, especially over elevated bridges, elevating the risk of injury and accidents during evacuations if not timed properly.
- Emergency evacuations may be necessary prior to a hurricane landfall, requiring emergency responders, evacuation routing and temporary shelters.

## SECTION 6: HURRICANE WIND

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

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

# SECTION 7: THUNDERSTORM WIND

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## HAZARD DESCRIPTION

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

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



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

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

## LOCATION

Thunderstorms wind events can develop in any geographic location and are considered a common occurrence in Texas. Therefore, a thunderstorm wind event could occur at any location within the City of Weslaco's planning area as these storms develop randomly and are not confined to any geographic area. It is assumed that the City of Weslaco planning area is uniformly exposed to the threat of thunderstorms winds.

## SECTION 7: THUNDERSTORM WIND

### EXTENT

The extent or magnitude of a thunderstorm wind event is measured by the Beaufort Wind Scale. Table 7-1 describes the different intensities of wind in terms of speed and effects, from calm to violent and destructive.

**Table 7-1. Beaufort Wind Scale<sup>1</sup>**

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

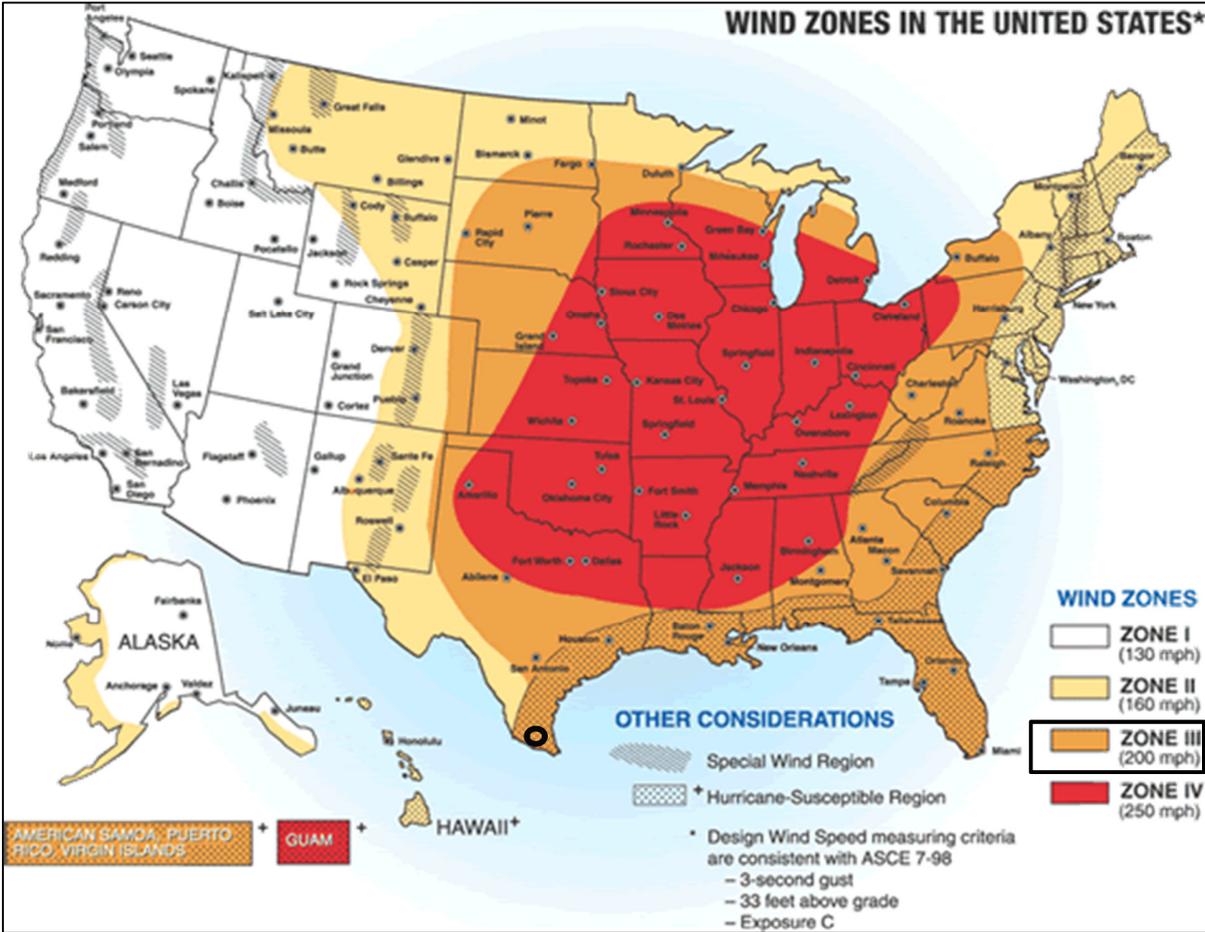
Figure 7-1 displays the wind zones as derived from NOAA.

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<sup>1</sup> Source: World Meteorological Organization

SECTION 7: THUNDERSTORM WIND

Figure 7-1. Wind Zones in the United States<sup>2</sup>



On average, Hidalgo County, including the City of Weslaco, experiences two to three thunderstorm wind events every year. The planning area is located in Zone III, meaning they can experience winds up to 200 mph. Hidalgo County, including the City of Weslaco, has experienced a significant wind event or an event with winds in the range of “Force 12” on the Beaufort Wind Scale with winds at or above 83 mph. This is the most significant event that can be expected in the future for the planning area.

**HISTORICAL OCCURRENCES**

Tables 7-2, 7-3, and 7-4 depict historical occurrences of thunderstorm wind events for the City of Weslaco planning area according to the National Centers for Environmental Information (NCEI) data. Since January 1960, 164 thunderstorm wind events are known to have impacted Hidalgo County, including the City of Weslaco planning area, based upon NCEI records. Table 7-3 presents information on known historical events impacting Hidalgo County including the City of Weslaco planning area with resulting damages, injuries or fatalities. It is important to note that

<sup>2</sup> City of Weslaco is indicated by the circle.

## SECTION 7: THUNDERSTORM WIND

high wind events associated with other hazards, such as tornadoes, are not accounted for in this section.

The NCEI is a national data source organized under the National Oceanic and Atmospheric Administration. The NCEI is the largest archive available for climate data; however, it is important to note that the only incidents recorded are those that are reported to the NCEI from 1960 through November 2019 have been factored into this risk assessment. In the tables that follow throughout this section, some occurrences seem to appear multiple times in one table. This is due to reports from various locations throughout the County. In addition, property damage estimates are not always available. Where an estimate has been provided in a table for losses, the dollar amounts have been altered to indicate the damage in 2020 dollars.

Historical thunderstorm wind data for Hidalgo County, including the City of Weslaco, are provided on a County-wide basis per the NCEI database.

**Table 7-2. Historical Thunderstorm Wind Events with Reported Damages, 1960-2019**

MAXIMUM WIND SPEED RECORDED (MPH)	NUMBER OF REPORTED EVENTS
0-30	29
31-40	16
41-50	32
51-60	59
61-70	20
71-80	1
81-90	2
91-100	0
Unknown	5

**Table 7-3. Historical Thunderstorm Wind Events, 1960-2019<sup>3</sup>**

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE <sup>4</sup>	CROP DAMAGE
Hidalgo County	4/8/1993	2:25 AM	0	0	0	\$83	\$0
City of Weslaco	3/9/1994	7:00 AM	0	0	0	\$87,626	\$8,763
Hidalgo County	8/17/1994	10:40 PM	0	0	0	\$81	\$0

<sup>3</sup> Only recorded events with fatalities, injuries or damages are listed. Magnitude is listed when available. Damage values are in 2020 dollars.

<sup>4</sup> Countywide damages have been adjusted to reflect only a percentage (0.93%) of the damages attributed to the City of Weslaco.

## SECTION 7: THUNDERSTORM WIND

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE <sup>4</sup>	CROP DAMAGE
Hidalgo County	10/8/1994	4:00 PM	0	0	0	\$112	\$64
Hidalgo County	2/28/1995	3:00 PM	0	0	0	\$48	\$0
Hidalgo County	5/28/1997	12:00 AM	Unknown	0	0	\$15	\$0
Hidalgo County	9/23/1997	7:05 PM	60	0	0	\$22	\$0
Hidalgo County	2/21/1998	6:15 PM	Unknown	0	0	\$44	\$0
Hidalgo County	3/27/1999	7:15 PM	Unknown	0	0	\$73	\$0
Hidalgo County	5/18/1999	4:30 AM	Unknown	0	0	\$115	\$0
Hidalgo County	5/18/1999	5:00 AM	Unknown	0	0	\$72	\$0
Hidalgo County	5/21/2001	8:30 PM	60	0	0	\$135	\$0
Hidalgo County	8/31/2001	8:25 PM	74	0	0	\$676	\$0
Hidalgo County	7/20/2005	6:00 AM	55	0	0	\$368	\$0
Hidalgo County	8/31/2005	3:45 PM	50	0	0	\$122	\$0
Hidalgo County	8/31/2005	5:13 PM	65	0	0	\$122	\$0
Hidalgo County	3/8/2006	12:00 PM	50	0	1	\$360	\$0
Hidalgo County	5/10/2006	6:15 PM	65	0	0	\$118	\$0
Hidalgo County	5/14/2006	11:01 PM	60	0	0	\$592	\$0
City of Weslaco	5/14/2006	11:10 PM	60	0	0	\$63,697	\$0
Hidalgo County	7/3/2006	5:52 PM	60	0	0	\$59	\$0
Hidalgo County	9/24/2006	7:40 AM	60	0	0	\$137	\$0
Hidalgo County	11/15/2006	1:00 PM	50	0	0	\$36	\$0
Hidalgo County	2/16/2008	12:00 PM	35	0	0	\$23	\$0
Hidalgo County	3/2/2008	12:00 PM	40	0	0	\$11	\$0
Hidalgo County	3/17/2008	9:00 AM	42	0	0	\$22	\$0
Hidalgo County	3/18/2008	2:53 PM	35	0	2	\$112	\$0
Hidalgo County	5/16/2008	2:02 AM	61	0	0	\$1,384	\$0
Hidalgo County	6/3/2009	7:20 PM	53	0	0	\$111	\$0
Hidalgo County	6/3/2009	7:27 PM	54	0	0	\$22	\$0
Hidalgo County	12/24/2009	3:30 AM	41	0	0	\$6	\$0

## SECTION 7: THUNDERSTORM WIND

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE <sup>4</sup>	CROP DAMAGE
Hidalgo County	12/24/2009	3:00 PM	33	0	0	\$22	\$0
Hidalgo County	5/18/2010	7:55 AM	52	0	0	\$55	\$0
City of Weslaco	5/18/2010	8:06 AM	39	0	0	\$2,365	\$0
Hidalgo County	6/7/2010	2:45 PM	61	0	0	\$826	\$0
Hidalgo County	11/25/2010	11:00 AM	39	0	0	\$16	\$0
Hidalgo County	5/8/2012	4:06 PM	89	0	1	\$522	\$0
Hidalgo County	5/9/2012	8:25 PM	56	0	0	\$261	\$0
Hidalgo County	10/18/2012	5:17 PM	61	0	0	\$78	\$0
Hidalgo County	10/18/2012	5:55 PM	48	0	0	\$10	\$0
Hidalgo County	10/18/2012	6:15 PM	50	0	0	\$52	\$0
Hidalgo County	2/25/2013	12:07 PM	31	0	0	\$52	\$0
Hidalgo County	4/28/2013	11:20 AM	42	0	0	\$52	\$0
City of Weslaco	6/2/2013	1:35 PM	56	0	0	\$110,478	\$0
Hidalgo County	6/7/2013	5:19 PM	45	0	0	\$103	\$0
Hidalgo County	11/1/2013	7:18 PM	52	0	0	\$154	\$0
Hidalgo County	1/23/2014	6:54 PM	43	0	0	\$51	\$0
Hidalgo County	3/16/2014	3:15 PM	35	0	0	\$10	\$0
Hidalgo County	4/14/2014	1:45 PM	35	0	0	\$51	\$0
Hidalgo County	5/9/2014	7:00 PM	50	0	0	\$71	\$0
Hidalgo County	5/9/2014	7:23 PM	43	0	0	\$10	\$0
Hidalgo County	5/9/2014	7:23 PM	50	0	0	\$50	\$0
Hidalgo County	5/9/2014	7:23 PM	50	0	0	\$50	\$0
Hidalgo County	8/13/2014	2:54 PM	56	0	0	\$403	\$0
Hidalgo County	8/13/2014	3:00 PM	56	0	0	\$403	\$0
Hidalgo County	8/13/2014	3:02 PM	52	0	0	\$10	\$0
Hidalgo County	8/13/2014	3:15 PM	52	0	0	\$50	\$0
Hidalgo County	8/13/2014	3:18 PM	52	0	0	\$30	\$0
Hidalgo County	8/13/2014	3:20 PM	52	0	0	\$10	\$0

## SECTION 7: THUNDERSTORM WIND

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE <sup>4</sup>	CROP DAMAGE
Hidalgo County	3/26/2015	11:51 AM	56	0	0	\$61	\$0
Hidalgo County	4/12/2015	10:00 PM	39	0	0	\$10	\$0
Hidalgo County	4/24/2015	10:09 PM	70	0	0	\$1,014	\$0
Hidalgo County	4/24/2015	10:11 PM	61	0	0	\$101	\$0
Hidalgo County	4/24/2015	10:13 PM	65	0	0	\$1,268	\$0
Hidalgo County	5/11/2015	11:00 PM	61	0	0	\$0	\$504
Hidalgo County	5/12/2015	12:00 AM	39	0	0	\$20	\$0
Hidalgo County	5/12/2015	12:20 AM	61	0	0	\$1,009	\$0
Hidalgo County	5/12/2015	12:20 AM	52	0	0	\$20	\$0
Hidalgo County	5/29/2015	6:40 AM	39	0	0	\$10	\$0
Hidalgo County	8/19/2015	11:33 PM	43	0	0	\$20	\$0
Hidalgo County	8/19/2015	11:40 PM	52	0	0	\$20	\$0
City of Weslaco	8/20/2015	12:45 AM	52	0	0	\$5,412	\$0
Hidalgo County	10/13/2015	2:15 PM	52	0	0	\$303	\$0
Hidalgo County	1/16/2016	12:40 PM	42	0	0	\$15	\$0
Hidalgo County	3/9/2016	6:25 AM	52	0	0	\$121	\$0
Hidalgo County	5/14/2016	4:35 PM	56	0	0	\$4,993	\$499
Hidalgo County	5/31/2016	9:11 PM	83	0	0	\$99,868	\$4,993
Hidalgo County	10/20/2016	4:17 PM	48	0	0	\$99	\$0
Hidalgo County	5/29/2017	1:14 AM	35	0	0	\$5	\$0
Hidalgo County	1/11/2018	7:15 PM	47	0	0	\$145	\$0
Hidalgo County	4/7/2019	7:30 AM	46	0	0	\$47	\$0
Hidalgo County	5/14/2019	4:00 AM	52	0	0	\$9	\$0
Hidalgo County	5/14/2019	4:25 AM	56	0	0	\$187	\$0
Hidalgo County	6/7/2019	3:08 PM	50	0	0	\$47	\$0
Hidalgo County	6/7/2019	3:22 PM	50	0	0	\$75	\$0
Hidalgo County	6/24/2019	5:00 PM	36	0	0	\$19	\$0
Hidalgo County	6/24/2019	6:13 PM	65	0	0	\$937	\$0

## SECTION 7: THUNDERSTORM WIND

JURISDICTION	DATE	TIME	MAGNITUDE (MPH)	DEATHS	INJURIES	PROPERTY DAMAGE <sup>4</sup>	CROP DAMAGE
Hidalgo County	6/24/2019	6:15 PM	45	0	0	\$9	\$0
Hidalgo County	6/24/2019	6:30 PM	36	0	0	\$9	\$0
Hidalgo County	8/25/2019	4:45 PM	52	0	0	\$47	\$0
Hidalgo County	11/20/2019	2:53 PM	36	0	0	\$9	\$0
<b>TOTALS</b>			(Max Extent)	<b>0</b>	<b>4</b>	<b>\$388,559</b>	<b>\$14,823</b>

**Table 7-4. Summary of Historical Thunderstorm Wind Events, 1960-2019**

JURISDICTION	NUMBER OF EVENTS	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE <sup>5</sup>	CROP DAMAGE
City of Weslaco	6	60	0	0	\$269,578	\$8,763
Hidalgo County	158	89	0	4	\$118,981	\$6,060
<b>TOTAL LOSSES</b>	<b>164</b>	(Max Extent)	<b>0</b>	<b>4</b>	<b>\$403,382</b>	

### SIGNIFICANT EVENTS

#### May 31, 2016

Damage to tree limbs and more than 100 homes sustained varying levels of damage, dozens of power poles were destroyed causing 20,000 citizens without power, and hundreds of softwood trees were uprooted. Specific damage and associated impacts included the following: At least 150 homes and businesses sustained notable damage, and several dozen required significant repair. This included varied damage to nearly every building (RV, trailer, and fixed structure) in the Chimney Park RV and Mobile Home Park along the Rio Grande, as well as the adjacent neighborhood of Madero. The State Farm Arena lost a large part of its cladding (side wall) and up to 40% of its roof shingles and underneath decking allowing rainwater to leak into the facility. A large community center was destroyed within the county. A tractor trailer weighing 79,000 pounds, including freight, was moved and then tipped on its side in the community of Madero.

### PROBABILITY OF FUTURE EVENTS

Most thunderstorm winds occur during the months of March, April, May, and September. Due to the limited number of events reported for the City of Weslaco, the analysis focused on the reported events for Hidalgo County to reflect a greater probability for the planning area. This more accurately depicts the risk for the planning area based on the planning team and stakeholder accounts. Based on available records of historic events, there have been 164 events in a 60-year reporting period, which provides a probability of two to three events every year. Even though the intensity of thunderstorm wind events is not always damaging for the City of Weslaco planning

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<sup>5</sup> Countywide damages have been adjusted to reflect only a percentage (0.93%) of the damages attributed to the City of Weslaco.

## SECTION 7: THUNDERSTORM WIND

area, the frequency of occurrence for a thunderstorm wind event is highly likely. This means that an event is probable within the next year for the City of Weslaco planning area.

### VULNERABILITY AND IMPACT

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

Trees, power lines and poles, signage, manufactured housing, radio towers, concrete block walls, storage barns, windows, garbage receptacles, brick facades, and vehicles, unless reinforced, are vulnerable to thunderstorm wind events. More severe damage involves windborne debris; in some instances, patio furniture and other lawn items have been reported to have been blown around by wind and, very commonly, debris from damaged structures in turn have caused damage to other buildings not directly impacted by the event. In numerous instances roofs have been reported as having been torn off of buildings. The portable buildings typically used at schools and construction sites would be more vulnerable to thunderstorm wind events than typical site-built structures and could potentially pose a greater risk for wind-blown debris.

The US Census data indicates a total of 3,234 manufactured homes (approximately 20.7%) located in the City of Weslaco planning area (Table 7-5). In addition, 34.7% (approximately 5,428 structures) of the residential structures in the City of Weslaco planning area were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant wind events.

**Table 7-5. Structures at Greater Risk<sup>6</sup>**

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
City of Weslaco	3,234	5,428

While all citizens are at risk to the impacts of thunderstorm wind, forced relocation and disaster recovery drastically impacts low-income residents who lack the financial means to travel, afford a long-term stay away from home, and to rebuild or repair their homes. An estimated 26.1% of the planning area population live below the poverty level (Table 7-6).

**Table 7-6. Populations at Greatest Risk**

JURISDICTION	POPULATION BELOW POVERTY LEVEL
City of Weslaco	10,289

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<sup>6</sup> US Census Bureau 2018 data for the City of Weslaco.

# SECTION 7: THUNDERSTORM WIND

The following critical facilities would be vulnerable to thunderstorm wind events in the City of Weslaco:

**Table 7-7. Critical Facilities at Risk**

JURISDICTION	CRITICAL FACILITIES
City of Weslaco	1 Airport, 1 Police Station, 1 Government Facility, 4 Fire Stations, 5 Medical Facilities, 21 Schools, 1 College, 1 Public Works Department, 3 Water/Wastewater Treatment Facilities

A thunderstorm wind event can also result in traffic disruptions, injuries and in rare cases, fatalities. Impact of thunderstorms winds experienced in the City of Weslaco planning area, has resulted in no injuries or fatalities. Impact of thunderstorm wind events experienced in the City of Weslaco planning area would be “Limited,” and injuries and illnesses would be treatable with first aid, less than ten percent of property damaged or destroyed, and facilities would be shut down for 24 hours or less. Overall, the average loss estimate for the City of Weslaco, (in 2020 dollars) is \$403,382, having an approximate annual loss estimate of \$6,723 (Table 7-8).

**Table 7-8. Potential Annualized Losses**

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
City of Weslaco	\$278,341	\$4,639
Hidalgo County	\$125,041	\$2,084
<b>Totals</b>	<b>\$403,382</b>	<b>\$6,723</b>

## ASSESSMENT OF IMPACTS

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

- Individuals exposed to the storm can be struck by flying debris, falling limbs, or downed trees causing serious injury or death.
- Structures can be damaged or crushed by falling trees, which can result in physical harm to the occupants.
- Significant debris and downed trees can result in emergency response vehicles being unable to access areas of the community.
- Downed power lines may result in roadways being unsafe for use, which may prevent first responders from answering calls for assistance or rescue.
- During exceptionally heavy wind events, first responders may be prevented from responding to calls, as the winds may reach a speed in which their vehicles and equipment are unsafe to operate.

## SECTION 7: THUNDERSTORM WIND

- Thunderstorm wind events often result in widespread power outages increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.
- Extended power outage often results in an increase in structure fires and carbon monoxide poisoning, as individuals attempt to cook or heat their homes with alternate, unsafe cooking or heating devices, such as grills.
- First responders are exposed to downed power lines, unstable and unusual debris, hazardous materials, and generally unsafe conditions.
- Emergency operations and services may be significantly impacted due to damaged facilities and/or loss of communications.
- Critical staff may be unable to report for duty, limiting response capabilities.
- City departments may be damaged, delaying response and recovery efforts for the entire community.
- Private sector entities that the City and its residents rely on, such as utility providers, financial institutions, and medical care providers may not be fully operational and may require assistance from neighboring communities until full services can be restored.
- Economic disruption negatively impacts the programs and services provided by the community due to short- and long-term loss in revenue.
- Some businesses not directly damaged by thunderstorm wind events may be negatively impacted while roads are cleared and utilities are being restored, further slowing economic recovery.
- Older structures built to less stringent building codes may suffer greater damage as they are typically more vulnerable to thunderstorm winds.
- Large scale wind events can have significant economic impact on the affected area, as it must now fund expenses such as infrastructure repair and restoration, temporary services and facilities, overtime pay for responders, and normal day-to-day operating expenses.
- Businesses that are more reliant on utility infrastructure than others may suffer greater damages without a backup power source.
- Recreational areas and parks may be damaged or inaccessible due to downed trees or debris, causing temporary impacts to area businesses.

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

# SECTION 8: EXTREME HEAT

- Hazard Description ..... 1
- Location ..... 1
- Extent ..... 1
- Historical Occurrences ..... 4
  - Significant Events ..... 6
- Probability of Future Events ..... 6
- Vulnerability and Impact ..... 6
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## HAZARD DESCRIPTION

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



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

## LOCATION

Though a death from extreme heat has not been recorded at a specific location in the County, there is no specific geographic scope to the extreme heat hazard. Extreme heat could occur anywhere within the City of Weslaco planning area, including all participating jurisdictions.

## EXTENT

The magnitude or intensity of an extreme heat event is measured according to temperature in relation to the percentage of humidity. According to the National Oceanic Atmospheric Administration (NOAA), this relationship is referred to as the “Heat Index” and is depicted in Figure 8-1. This index measures how hot it feels outside when humidity is combined with high temperatures.

## SECTION 8: EXTREME HEAT

**Figure 8-1. Extent Scale for Extreme Summer Heat<sup>1</sup>**

Temperatures (°F)		Temperatures (°F)		Temperatures (°F)		Temperatures (°F)	
40	80 - 88: CAUTION	40	90 - 96: EXTREME CAUTION	40	98 - 106: DANGER	40	108 - 110: EXTREME DANGER
45	80 - 88: CAUTION	45	90 - 94: EXTREME CAUTION	45	96 - 104: DANGER	45	106 - 110: EXTREME DANGER
50	80 - 86: CAUTION	50	88 - 94: EXTREME CAUTION	50	96 - 102: DANGER	50	104 - 110: EXTREME DANGER
55	80 - 86: CAUTION	55	88 - 92: EXTREME CAUTION	55	94 - 100: DANGER	55	102 - 110: EXTREME DANGER
60	80 - 84: CAUTION	60	86 - 90: EXTREME CAUTION	60	92 - 98: DANGER	60	100 - 110: EXTREME DANGER
65	80 - 84: CAUTION	65	86 - 90: EXTREME CAUTION	65	92 - 96: DANGER	65	98 - 110: EXTREME DANGER
70	80 - 84: CAUTION	70	86 - 88: EXTREME CAUTION	70	90 - 94: DANGER	70	96 - 110: EXTREME DANGER
75	80 - 82: CAUTION	75	84 - 88: EXTREME CAUTION	75	90 - 94: DANGER	75	96 - 110: EXTREME DANGER
80	80 - 82: CAUTION	80	84 - 86: EXTREME CAUTION	80	88 - 92: DANGER	80	94 - 110: EXTREME DANGER
85	80 - 82: CAUTION	85	84 - 86: EXTREME CAUTION	85	88 - 90: DANGER	85	92 - 110: EXTREME DANGER
90	80: CAUTION	90	82 - 84: EXTREME CAUTION	90	86 - 90: DANGER	90	92 - 110: EXTREME DANGER
95	80: CAUTION	95	82 - 84: EXTREME CAUTION	95	86 - 88: DANGER	95	90 - 110: EXTREME DANGER
100	80: CAUTION	100	82 - 84: EXTREME CAUTION	100	86 - 88: DANGER	100	90 - 110: EXTREME DANGER

**Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity**

The Extent Scale in Figure 8-1 displays varying categories of caution depending on the relative humidity combined with the temperature. For example, when the temperature is at 90 degrees Fahrenheit (°F) or lower, caution should be exercised if the humidity level is at or above 40 percent.

The shaded zones on the chart indicate varying symptoms or disorders that could occur depending on the magnitude or intensity of the event. “Caution” is the first category of intensity, and it indicates when fatigue due to heat exposure is possible. “Extreme Caution” indicates that sunstroke, muscle cramps, or heat exhaustion are possible, and a “Danger” level means that these symptoms are likely. “Extreme Danger” indicates that heat stroke is likely. The National Weather Service (NWS) initiates alerts based on the Heat Index as shown in Table 8-1.

**Table 8-1. Heat Index and Warnings**

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

<sup>1</sup> Source: NOAA

## SECTION 8: EXTREME HEAT

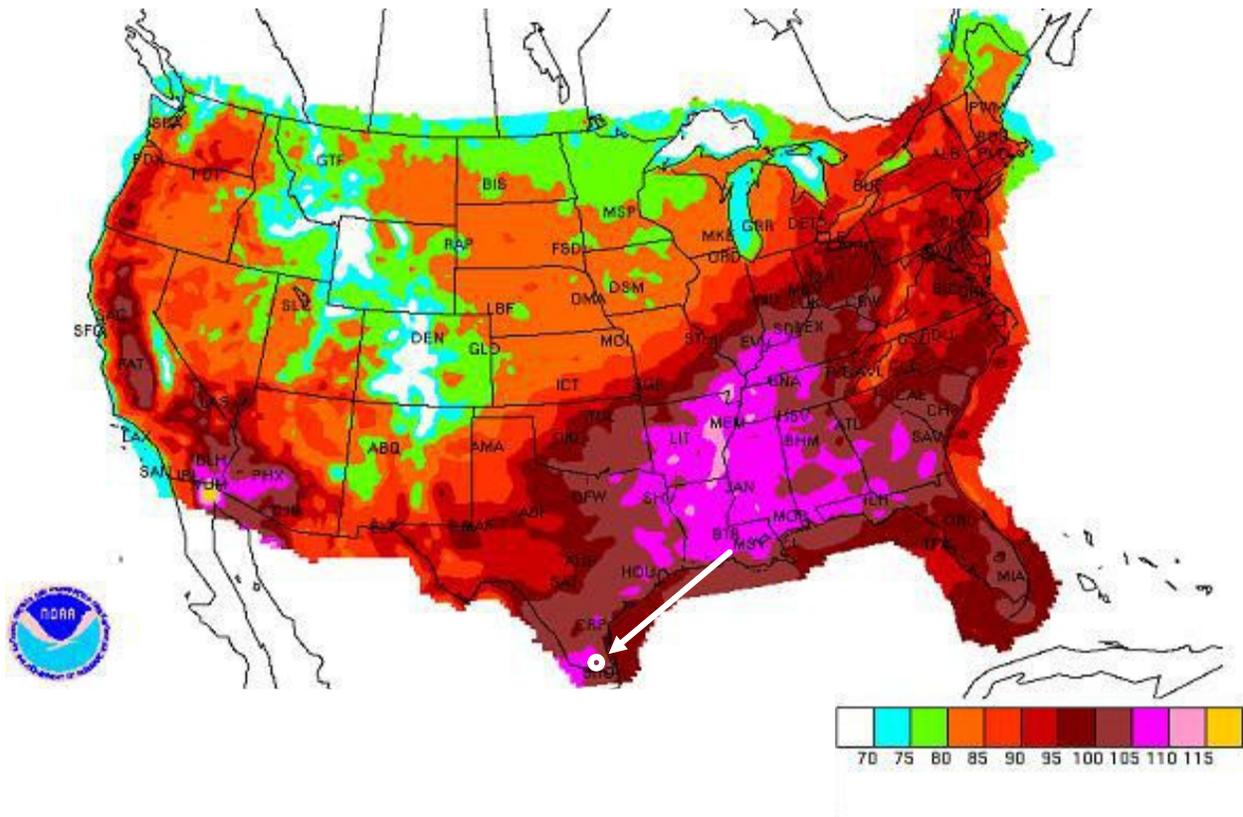
CATEGORY	HEAT INDEX	POSSIBLE HEAT DISORDERS	WARNING TYPE
Extreme Caution	90 – 103°F	Sunstroke, muscle cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.	An Excessive Heat Warning is issued if the Heat Index rises above 105°F at least 3 hours during the day or above 80°F at night.
Caution	80 – 90°F	Fatigue is possible with prolonged exposure and/or physical activity.	

Hidalgo County, including the City of Weslaco covers 1,583 square miles, with an elevation range from forty to 200 feet. The northern part of the county has sandy and light loamy soils over deep reddish or mottled, clayey subsoils. In some areas, limestone lies within forty inches of the surface. The southern part of the county has moderately deep to deep loamy surfaces over clayey subsoils. Along the Rio Grande brown to red clays occur. The City of Weslaco lies just a few miles north of the Rio Grande on the eastern side of the county. Hidalgo County is in the South Texas Plains vegetation area, which features grasses, mesquite, live oaks, and chaparral. Native plants, reduced in recent years by extensive farming, include chapote, guayacan, ebony, huisache, Brazilwood, and yucca. Natural resources include caliche, sand, gravel, oil, and gas. The climate is subtropical and subhumid. Temperatures range from an average low of 47° F in January to an average high to 96° in July; the average annual temperature is 73°. Rainfall averages twenty-three inches a year, and the growing season lasts for 320 days of the year. Averages for Hidalgo County are considered similar to the City of Weslaco planning area which is located in the county.

Figure 8-2 displays the daily maximum heat index as derived from NOAA based on data compiled from 1838 to 2015. The white circle shows the City of Weslaco planning area. The pink and brown colors indicate a daily maximum heat index of 100° to 110°F. The City of Weslaco could experience extreme heat from 90° to 110°F in the future. The record high temperature for the City of Weslaco planning area was 110°F in 1998 and again in 1999. This is the highest temperature (danger category) the planning area can expect.

## SECTION 8: EXTREME HEAT

**Figure 8-2. Average Daily Maximum Heat Index Days<sup>2</sup>**



### HISTORICAL OCCURRENCES

Every summer, the hazard of heat-related illness becomes a significant public health issue throughout much of the US. Mortality from all causes increases during heat waves, and excessive heat is an important contributing factor to deaths from other causes, particularly among the elderly. Table 8-2 depicts historical occurrences of mortality from heat from 1994 to 2004 from the Texas Department of State Health Services and 2005 through November 2019 from the NCEI database.

**Table 8-2. Extreme Heat Related Deaths in Texas**

YEAR	DEATHS
1994	1
1995	12
1996	10
1997	2

<sup>2</sup> Source: NRDC and the white circle indicates the City of Weslaco planning area.

## SECTION 8: EXTREME HEAT

YEAR	DEATHS
1998	66
1999	22
2000	71
2001	20
2002	1
2003	0
2004	3
2005	49
2006	2
2007	2
2008	7
2009	120
2010	4
2011	46
2012	3
2013	2
2014	0
2015	5
2016	6
2017	3
2018	7
2019	7

Because the Texas Department of State Health Services reports on total events statewide, previous occurrences for extreme heat are derived from the NCEI database. According to heat related incidents located solely within Hidalgo County, there is only five heat waves<sup>3</sup> on record for the Hidalgo County planning area (Table 8-3). Historical extreme heat information, as provided by the NCEI, shows extreme heat activity across a multi-county forecast area for each event, the appropriate percentage of the total property and crop damage reported for the entire forecast area

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<sup>3</sup> Even though the City and County experience heat waves each summer, NCEI data only records events reported. Based on reports, only five events are on record.

## SECTION 8: EXTREME HEAT

has been allocated to each county impacted by the event. Historical extreme heat data for the planning area is provided on a County-wide basis per the NCEI database. Only extreme heat events that have been reported have been factored into this Risk Assessment. It is highly likely additional extreme heat occurrences have gone unreported before and during the recording period. Due to the limited number of reported events, average high temperatures have been analyzed in order to determine the probability of future events.

**Table 8-3. Historical Extreme Heat Events, 1998-2018**

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Hidalgo County	5/22/2008	0	0	\$0	\$0
Hidalgo County	7/6/2009	0	0	\$0	\$0
Hidalgo County	7/30/2009	0	0	\$0	\$0
Hidalgo County	8/20/2009	0	0	\$0	\$0
Hidalgo County	6/23/2019	4	0	\$0	\$0
<b>TOTALS</b>		<b>4</b>	<b>0</b>	<b>\$0</b>	<b>\$0</b>

### SIGNIFICANT EVENTS

#### **June 23, 2019**

More than a week of excessive heat across the Rio Grande Valley was a likely culprit in at least four deaths of undocumented immigrants who perished from heat stroke or severe heat exhaustion. The heat was the result of persistent atmospheric high pressure centered over central Texas, with low level southerly flow providing enhanced tropical moisture via exceptional dew point temperatures, even during the afternoon. The period of excessive heat was from June 17 through 24, so more fatalities may have occurred in the Rio Grande Valley during this time.

### PROBABILITY OF FUTURE EVENTS

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

### VULNERABILITY AND IMPACT

There is no defined geographic boundary for extreme heat events. While the entire City of Weslaco planning area is exposed to extreme temperatures, existing buildings, infrastructure, and critical facilities are not likely to sustain significant damage from extreme heat events. Therefore, any estimated property losses associated with the extreme heat hazard are anticipated to be minimal across the area.

Extreme temperatures do however present a significant threat to life and safety for the population of the city as a whole. Heat casualties for example are typically caused by a lack of adequate air-conditioning or heat exhaustion. The most vulnerable population to heat casualties are the elderly or infirmed who frequently live on low fixed incomes and cannot afford to run air-conditioning on

## SECTION 8: EXTREME HEAT

a regular basis. This population is sometimes isolated, with no immediate family or friends to look out for their well-being. Children may also be more vulnerable if left unattended in vehicles. In addition, populations living below the poverty level are unable to run air-conditioning on a regular basis and are limited in their ability to seek medical treatment. Another segment of the population at risk are those whose jobs consist of strenuous labor outdoors. Additionally, livestock and crops can become stressed, decreasing in quality or in production, during times of extreme heat.

The population over 65 in the City of Weslaco planning area is estimated at 19.6% of the total population and children under the age of 5 are estimated at 10.3%, or an estimated total of 9,865<sup>4</sup> potentially vulnerable residents in the planning area based on age. In addition, an estimated 26.1% of the planning area population live below the poverty level (Table 8-4).

**Table 8-4. Populations at Greater Risk**

JURISDICTION	POPULATION 65 AND OLDER	POPULATION UNDER 5	POPULATION BELOW POVERTY LEVEL
City of Weslaco	5,790	4,075	10,289

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

Typically, more than 12 hours of warning time would be given before the onset of an extreme heat event. In terms of vulnerability to structures, the impact from extreme heat would be negligible. It is possible that critical facilities and infrastructure could be shut down for 24 hours if cooling units are running constantly, leading to a temporary power outage. Less than ten percent of residential and commercial property could be damaged if extreme heat events lead to structure fires. However, based on the historical fatalities in the planning area, the potential impact of extreme heat for the entire City of Weslaco planning area can be considered “Substantial,” with multiple deaths possible depending on the length and degree of the heat wave. Based on historical records over a 24-year period, annualized property and crop losses for the City of Weslaco planning area are negligible.

### ASSESSMENT OF IMPACTS

The greatest risk from extreme heat is to public health and safety. The impact of climate change could produce longer, more severe heat waves, exacerbating the current impacts. Worsening extreme heat conditions can be frequently associated with a variety of impacts, including:

- Vulnerable populations, particularly the elderly and children under 5, can face serious or life-threatening health problems from exposure to extreme heat including hyperthermia, heat cramps, heat exhaustion, and heat stroke (or sunstroke).
- Response personnel, including utility workers, public works personnel, and any other professions where individuals are required to work outside, are more subject to extreme heat related illnesses since their exposure would typically be greater.

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<sup>4</sup> U.S. Census Bureau 2018 data for City of Weslaco

## SECTION 8: EXTREME HEAT

- High energy demand periods can outpace the supply of energy, potentially creating the need for rolling brownouts which would elevate the risk of illness to vulnerable residents.
- Highways and roads may be damaged by excessive heat causing asphalt roads to soften and concrete roads to shift or buckle.
- Vehicles engines and cooling systems typically run harder during extreme heat events resulting in increases in mechanical failures.
- Extreme heat events during times of drought can exacerbate the environmental impacts associated with drought, decreasing water and air quality and further degrading wildlife habitat.
- Extreme heat increases ground-level ozone (smog), increasing the risk of respiratory illnesses.
- Food suppliers can anticipate an increase in food costs due to increases in production costs and crop and livestock losses.
- Fisheries may be negatively impacted by extreme heat, suffering damage to fish habitats (either natural or man-made) and a loss of fish and/or other aquatic organisms due to decreased water flows or availability.
- Negatively impacted water suppliers may face increased costs resulting from the transport of water resources or development of supplemental water resources.

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

# SECTION 9: LIGHTNING

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- Location ..... 1
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## HAZARD DESCRIPTION

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

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

## LOCATION

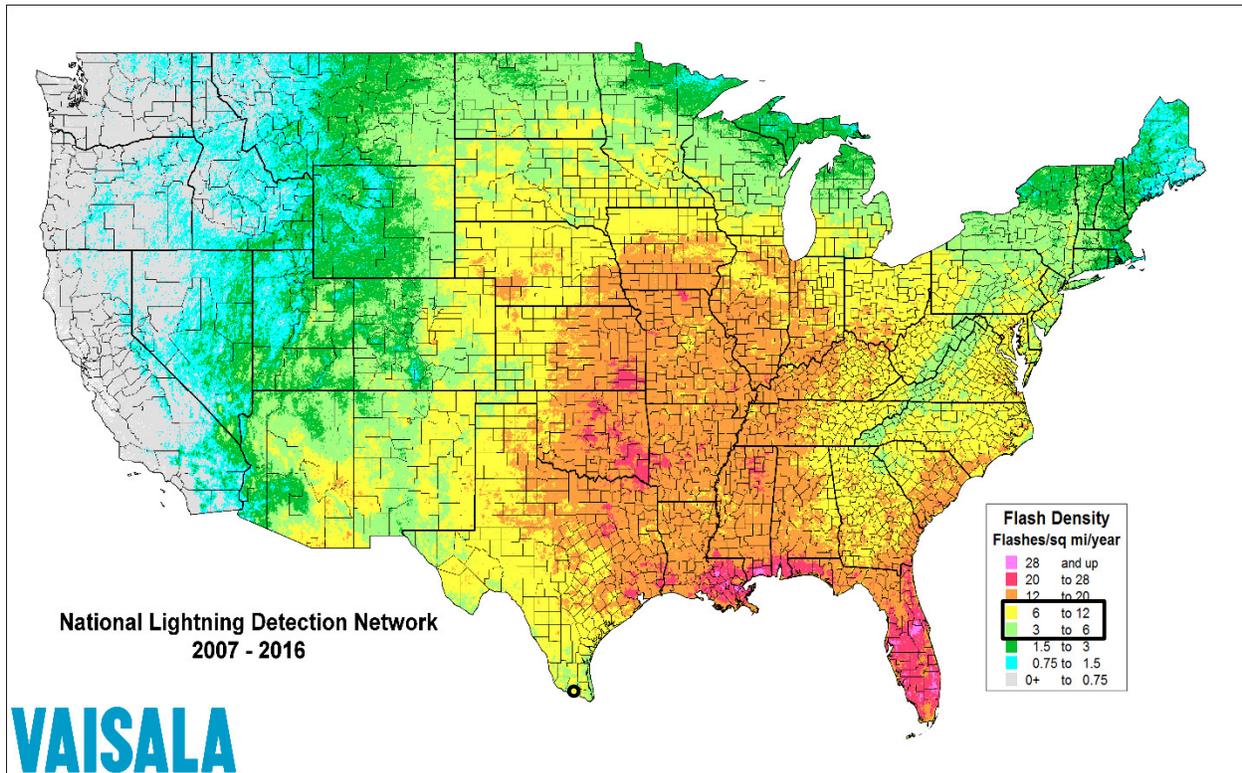
Lightning can strike in any geographic location and is considered a common occurrence in Texas. The City of Weslaco planning area is in a region of the country that is moderately susceptible to a lightning strike. Therefore, lightning could occur at any location within the entire planning area. It is assumed that the entire City of Weslaco planning area is uniformly exposed to the threat of lightning.

## EXTENT

According to the NOAA, the average number of cloud-to-ground flashes for the State of Texas between 2007 and 2016 was 11.3 flashes per square mile. Vaisala’s U.S. National Lightning Detection Network lightning flash density map (Figure 9-1) shows a range of three to twelve cloud-to-ground lightning flashes per square mile per year for Hidalgo County. This rate equates to approximately 4,749 to 18,996 flashes per year for the entire planning area. Readily available data indicates that the Lightning Activity Level (LAL) is best determined utilizing data at the county level as lightning event data is not as reliable on a per jurisdiction basis.

## SECTION 9: LIGHTNING

**Figure 9-1. Lightning Flash Density, 2007-2016**



The extent for lightning can be expressed in terms of the number of strikes in an interval. NOAA utilizes LALs on a scale from 1-6. LAL rankings reflect the frequency of cloud-to-ground lightning either forecast or observed (Table 9-1).

**Table 9-1. NOAA Lightning Activity Levels (LAL)**

LAL	CLOUD & STORM DEVELOPMENT	LIGHTNING STRIKES/ 15 MIN
1	No thunderstorms.	-
2	Cumulus clouds are common but only a few reach the towering cumulus stage. A single thunderstorm must be confirmed in the observation area. The clouds produce mainly virga, but light rain will occasionally reach the ground. Lightning is very infrequent.	1-8
3	Towering cumulus covers less than two-tenths of the sky. Thunderstorms are few, but two to three must occur within the observation area. Light to moderate rain will reach the ground, and lightning is infrequent.	9-15
4	Towering cumulus covers two to three-tenths of the sky. Thunderstorms are scattered and more than three must occur within the observation area. Moderate rain is common and lightning is frequent.	16-25

## SECTION 9: LIGHTNING

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

The NCEI does not include the LAL for historical lightning events, therefore in order to determine the extent of lightning strikes, the yearly average range of estimated number of lightning strikes within the planning area (4,749 to 18,996 flashes) and a cloud-to-ground flash density of three to twelve per square mile were divided by the number<sup>1</sup> of thunderstorm events that occur annually in the planning area. Hidalgo County, including the City of Weslaco, should expect an average range of three to fifteen lightning strikes within 15 minutes at any given time during a lightning or combined lightning and thunderstorm event, indicating lightning strikes have an average LAL range of 2 to 3. The highest being a 3 on the LAL for the planning area in the future.

### HISTORICAL OCCURRENCES

Since January 1996, there has only been ten recorded events for the Hidalgo County area. It is highly likely multiple lightning occurrences have gone unreported before and during the recording period. The NCEI is a national data source organized under the National Oceanic and Atmospheric Administration and considered a reliable resource for hazards. However, the flash density for the planning area along with input from local team members indicates regular lightning occurrences that simply have not been reported.

**Table 9-2 Historical Lightning Events, 1996- 2018<sup>2</sup>**

JURISDICTION	DATE	INJURIES	FATALITIES	PROPERTY DAMAGE <sup>3</sup>	CROP DAMAGE
Hidalgo County	6/25/1996	1	2	\$0	\$0
Hidalgo County	10/2/1996	0	1	\$0	\$0
Hidalgo County	8/14/1998	0	0	\$147	\$0
City of Weslaco	5/24/2009	0	0	\$120,628	\$0
Hidalgo County	5/28/2009	0	0	\$11,218	\$0
Hidalgo County	6/3/2010	0	0	\$220	\$0
City of Weslaco	6/7/2010	0	0	\$35,506	\$0

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

<sup>2</sup> Damages are reported in 2020 dollars.

<sup>3</sup> Countywide damages have been adjusted to reflect only a percentage (0.93%) of the damages attributed to the City of Weslaco.

## SECTION 9: LIGHTNING

JURISDICTION	DATE	INJURIES	FATALITIES	PROPERTY DAMAGE <sup>3</sup>	CROP DAMAGE
Hidalgo County	5/11/2012	0	0	\$157	\$0
Hidalgo County	8/20/2015	0	0	\$755	\$0
Hidalgo County	10/30/2015	0	0	\$101	\$0
<b>TOTALS</b>		<b>1</b>	<b>3</b>	<b>\$168,733</b>	<b>\$0</b>

**Table 9-3. Summary of Historical Lightning Events, 1996-2019**

JURISDICTION	NUMBER OF EVENTS	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
City of Weslaco	2	0	0	\$156,135	\$0
Hidalgo County	8	1	3	\$12,598	\$0
<b>TOTAL LOSSES</b>	<b>10</b>	<b>1</b>	<b>3</b>	<b>\$168,733</b>	

### SIGNIFICANT EVENTS

#### June 25, 1996

Lightning struck three men eating lunch in the bed of a pickup.

#### May 28, 2009

Frequent cloud to ground lightning strikes, associated with continuing strong storms which had earlier produced locally heavy rains and large hail moved across the McAllen/Edinburg area during the pre-dawn hours. One of these strikes started a roof fire by igniting shingles at an estate home. Within an hour, the blaze had engulfed the entire roof; residents were able to escape unharmed. Video showed the house, as well as a vehicle, to be a total loss, with replacement estimated to be near \$1 million.

### PROBABILITY OF FUTURE EVENTS

Due to the limited number of events reported for the City of Weslaco, the analysis focused on the reported events for Hidalgo County and the city to reflect a greater probability for the planning area. This more accurately depicts the risk for the planning area based on the planning team and stakeholder accounts.

Based on historical records and input from the planning team the probability of occurrence for future lightning events in the City of Weslaco planning area is considered highly likely, or an event probable in the next year. The planning team stated that lightning occurs regularly in the area. According to NOAA, Hidalgo County, including the City of Weslaco planning area is located in an area of the country that experiences three to twelve lightning flashes per square mile per year (approximately 4,749 to 18,996 flashes per year). Given this estimated probability of events, it can be expected that future lightning events will continue to threaten life and cause minor property damages throughout the planning area.

## SECTION 9: LIGHTNING

### VULNERABILITY AND IMPACT

Vulnerability is difficult to evaluate since lightning events can occur at different strength levels, in random locations, and can create a broad range of damages depending on the strike location. Due to the randomness of these events, all existing and future structures and facilities in the City of Weslaco planning area could potentially be impacted and remain vulnerable to possible injury and property loss from lightning strikes. The City of Weslaco planning area has two reported lightning events per the NCEI, however the entire planning area is vulnerable and could be impacted by lightning.

The direct and indirect losses associated with these events include injury and loss of life, damage to structures and infrastructure, agricultural losses, utility failure (power outages), and stress on community resources. The entire population of City of Weslaco is considered exposed to the lightning hazard. The peak lightning season in the State of Texas is from June to August; however, the most fatalities occur in July. Fatalities occur most often when people are outdoors and/or participating in some form of recreation. Population located outdoors is considered at risk and more vulnerable to a lightning strike compared to being inside a structure. Moving to a lower risk location will decrease a person's vulnerability.

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

While all citizens are at risk to the impacts of lightning, forced relocation and disaster recovery drastically impacts low-income residents who lack the financial means to travel, afford a long-term stay away from home, and to rebuild or repair their homes. An estimated 26.1% of the planning area population live below the poverty level (Table 9-4).

**Table 9-4. Populations at Greatest Risk<sup>4</sup>**

JURISDICTION	POPULATION BELOW POVERTY LEVEL
City of Weslaco	10,289

The following critical facilities would be vulnerable to lightning events in the City of Weslaco:

**Table 9-5. Critical Facilities at Risk**

JURISDICTION	CRITICAL FACILITIES
City of Weslaco	1 Airport, 1 Police Station, 1 Government Facility, 4 Fire Stations, 5 Medical Facilities, 21 Schools, 1 College, 1 Public Works Department, 3 Water/Wastewater Treatment Facilities

Impact of lightning experienced in the City of Weslaco planning area has resulted in no injuries or fatalities. Impact of lightning events experienced in the City of Weslaco planning area would be

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<sup>4</sup> US Census Bureau 2018 data for the City of Weslaco.

## SECTION 9: LIGHTNING

“Limited,” and injuries and illnesses would be treatable with first aid. The quality of life lost would be minor, and facilities would be shut down for 24 hours or less. Overall, the average loss estimate for the City of Weslaco is \$168,733, with annualized losses of \$7,031.

**Table 9-6. Potential Annualized Losses<sup>5</sup>**

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATE
City of Weslaco	\$156,135	\$6,506
Hidalgo County	\$12,598	\$525
<b>PLANNING AREA</b>	<b>\$168,733</b>	<b>\$7,031</b>

### ASSESSMENT OF IMPACTS

Lightning events have the potential to pose a significant risk to people and can create dangerous and difficult situations for public health and safety officials. The impact of climate change could produce more frequent and severe lightning events, exacerbating the current lightning impacts. Additional impacts to the planning area can include:

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

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<sup>5</sup> Damage values are in 2020 dollars.

## SECTION 9: LIGHTNING

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

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## HAZARD DESCRIPTION



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

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

**Table 10-1. Variations among Tornadoes**

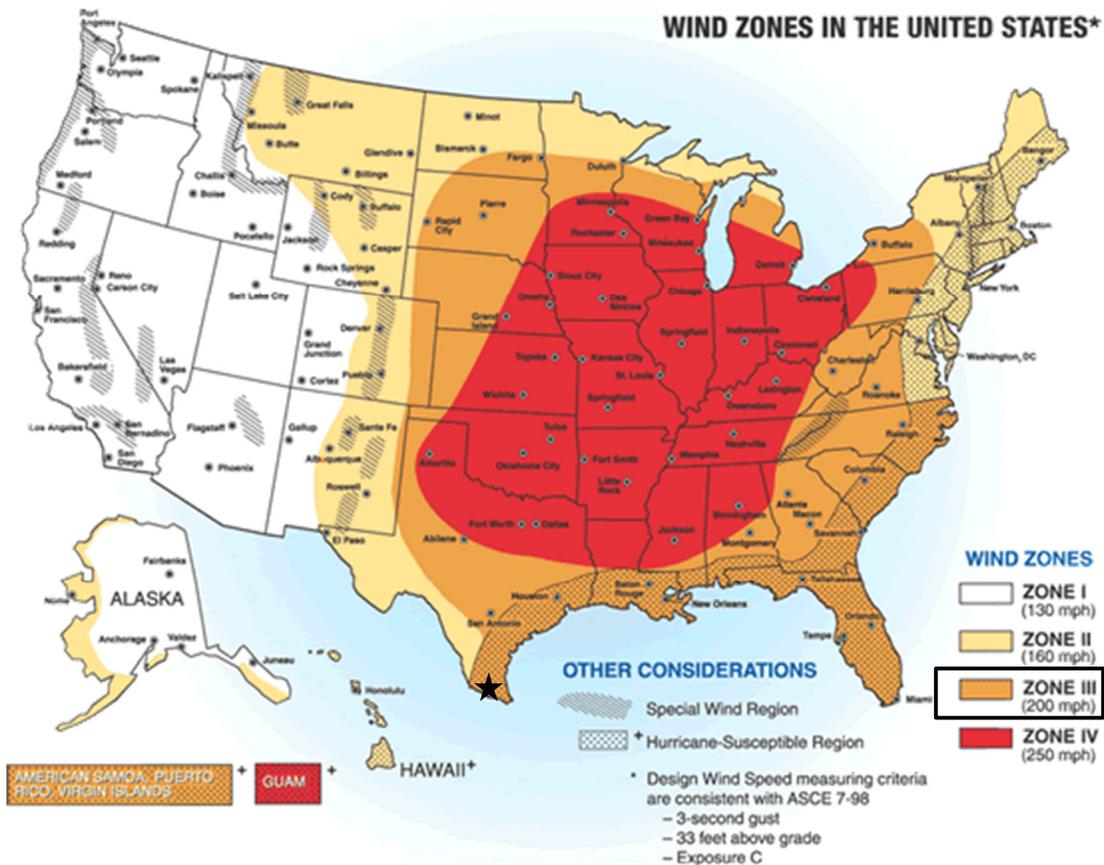
WEAK TORNADOES	STRONG TORNADOES	VIOLENT TORNADOES
<ul style="list-style-type: none"> <li>• 69% of all tornadoes</li> <li>• Less than 5% of tornado deaths</li> <li>• Lifetime 1-10+ minutes</li> <li>• Winds less than 110 mph</li> </ul>	<ul style="list-style-type: none"> <li>• 29% of all tornadoes</li> <li>• Nearly 30% of all tornado deaths</li> <li>• May last 20 minutes or longer</li> <li>• Winds 110 – 205 mph</li> </ul>	<ul style="list-style-type: none"> <li>• 2% of all tornadoes</li> <li>• 70% of all tornado deaths</li> <li>• Lifetime can exceed one hour</li> <li>• Winds greater than 205 mph</li> </ul>

## SECTION 10: TORNADO

### LOCATION

Tornadoes do not have any specific geographic boundary and can occur throughout the city uniformly. It is assumed that the entire City of Weslaco planning area is uniformly exposed to tornado activity. The entire City of Weslaco planning area is located in Wind Zone III (Figure 10-1), where tornado winds can be as high as 200 mph.

Figure 10-1. FEMA Wind Zones in the United States<sup>1</sup>



### EXTENT

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

<sup>1</sup> City of Weslaco is indicated by the star.

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**Table 10-2. The Fujita Tornado Scale<sup>2</sup>**

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

<sup>2</sup> Source: <http://www.tornado-project.com/f-scale/f-scale.htm>

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Tornado magnitudes prior to 2005 were determined using the traditional version of the Fujita Scale (Table 10-2). Since February 2007, the Fujita Scale has been replaced by the Enhanced Fujita Scale (Table 10-3), which retains the same basic design and six strength categories as the previous scale. The newer scale reflects more refined assessments of tornado damage surveys, standardization, and damage consideration to a wider range of structures.

**Table 10-3. Enhanced Fujita Scale for Tornadoes**

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

Both the Fujita Scale and Enhanced Fujita Scale should be referenced in reviewing previous occurrences since tornado events prior to 2007 will follow the original Fujita Scale. The largest

## SECTION 10: TORNADO

magnitude reported within the planning area is an F3 on the Fujita Scale, a “Severe Tornado.” Based on the planning areas location in Wind Zone III, the planning area could experience anywhere from an EF0 to EF5 depending on the wind speed.

The events in Hidalgo County, including the City of Weslaco, (converted from the Fujita Scale) have been between EF0 and EF3 (Table 10-4). Therefore, the range of intensity that the City of Weslaco planning area would be expected to mitigate is a tornado event that would be a low to severe risk, an EF0 to EF3. Historically, the strongest tornado to strike the planning area was a F3, which would be an EF3 on the Enhanced Fujita Scale with the highest wind speed. This is the strongest event the planning area can anticipate in the future.

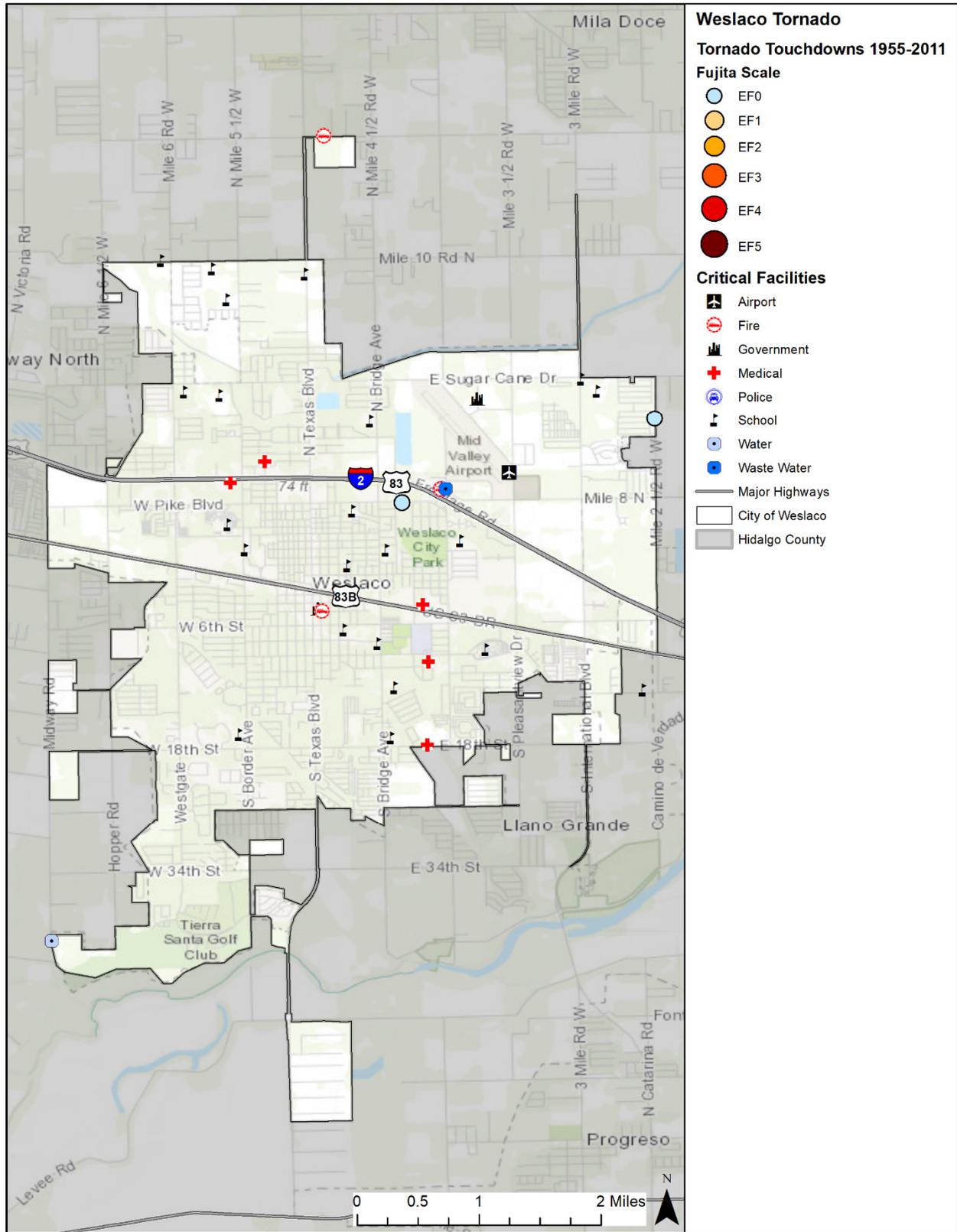
### HISTORICAL OCCURRENCES

Only reported tornadoes were factored into the Risk Assessment. It is likely that a high number of occurrences have gone unreported over the past 65 years. Historical tornado data for the county and city is provided within a jurisdiction-wide basis per the NCEI database.

Figure 10-2 identifies the locations of previous occurrences in Hidalgo County and the City of Weslaco planning area from 1955 through November 2019. A total of 44 events have been recorded by the Storm Prediction Center (NOAA) and NCEI databases for the Hidalgo County area including the City of Weslaco planning area.

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**Figure 10-2. Spatial Historical Tornado Events, 1955-2019<sup>3</sup>**



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**Table 10-4. Historical Tornado Events, 1955-2019<sup>4</sup>**

JURISDICTION	DATE	TIME	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Hidalgo County	10/18/1965	5:30 PM	F1	0	0	\$2,034	\$0
Hidalgo County	4/26/1967	8:00 PM	F2	0	0	\$194,842	\$0
Hidalgo County	8/10/1980	6:50 PM	F1	0	0	\$774,223	\$0
Hidalgo County	8/29/1981	1:47 PM	F1	0	0	\$69,873	\$0
Hidalgo County	3/15/1983	5:00 PM	F3	0	1	\$6,587,615	\$0
Hidalgo County	3/15/1983	5:15 PM	F3	0	9	\$6,587,615	\$0
Hidalgo County	3/15/1983	5:20 PM	F3	0	0	\$6,587,615	\$0
Hidalgo County	9/7/1983	1:40 PM	F1	0	0	\$77	\$0
Hidalgo County	6/14/1987	4:45 PM	F0	0	0	\$56,822	\$0
Hidalgo County	9/16/1988	8:45 AM	F0	0	0	\$538,337	\$0
Hidalgo County	9/16/1988	9:00 AM	F0	0	0	\$53,834	\$0
Hidalgo County	9/16/1988	9:45 AM	F0	0	1	\$538,337	\$0
Hidalgo County	9/16/1988	10:15 AM	F0	0	0	\$538,337	\$0
Hidalgo County	9/16/1988	11:01 AM	F0	0	0	\$538,337	\$0
Hidalgo County	9/16/1988	11:30 AM	F0	0	0	\$538,337	\$0
Hidalgo County	5/5/1991	8:52 AM	F0	0	0	\$475,610	\$0
Hidalgo County	6/14/1994	11:30 AM	F1	0	0	\$87,152	\$872
Hidalgo County	5/21/2001	8:15 PM	F1	0	0	\$43,552	\$0
Hidalgo County	5/21/2001	8:25 PM	F1	0	0	\$101,621	\$0
Hidalgo County	4/30/2003	12:09 AM	F1	0	11	\$2,105,313	\$0
Hidalgo County	6/1/2005	10:03 AM	F0	0	0	\$13,263	\$0
Hidalgo County	6/30/2011	4:57 PM	EF1	0	1	\$571,435	\$0
City of Weslaco	8/23/1999	2:30 PM	F0	0	0	\$9,263	\$0
City of Weslaco	8/23/1999	3:15 PM	F0	0	0	\$0	\$6,175

<sup>4</sup> Only recorded events with fatalities, injuries or damages are listed. Magnitude is listed when available. Damage values are in 2020 dollars. Damages are reported from January 1955 through November 2019. Only those events with reported damages, injuries or fatalities have been listed.

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JURISDICTION	DATE	TIME	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
City of Weslaco	6/1/2005	10:15 AM	F0	0	0	\$33,158	\$0
<b>TOTALS</b>			<b>(Max Extent)</b>	<b>0</b>	<b>23</b>	<b>\$27,046,601</b>	<b>\$7,047</b>

**Table 10-5. Summary of Historical Events, 1955-2019<sup>5</sup>**

JURISDICTION	NUMBER OF EVENTS	MAGNITUDE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
City of Weslaco	4	EFO	0	0	\$42,421	\$6,175
Hidalgo County	40	EF3	0	23	\$27,004,180	\$872
<b>TOTAL LOSSES</b>		<b>(Max Extent)</b>			<b>\$27,053,648</b>	

### SIGNIFICANT EVENTS

#### March 15, 1983

The tornado was preceded by ping pong ball sized hail. At initial touchdown only a few limbs were blown off trees. As the tornado began to expand into the multiple vortex, it unroofed and partially destroyed a large barn. It was estimated at F3 level with a damage track of 0.5 miles wide. A mobile home was tossed. The resident of the mobile home suffered severe head cuts and a shattered pelvis from flying debris. A set of wheels from the home were throw in into a nearby pickup which a woman and four small children were riding however no one was injured. A dump truck was tossed 80 to 100 feet and blew a van 80 feet into the yard. One man was nearly killed as he left a small building to get into his car and a piece of steel was blown through the window of the car. A second man was injured when he went to move his car into the garage. The garage door slammed into the car by the wind. The man attempted to free the door, he was picked up by the wind and tossed about 50 feet. He was able to crawl back into his house. Power poles and mobile homes were damaged and/or destroyed.

#### April 30, 2003

Damage report and survey determined that an F1 tornado touched down in Hidalgo County. Thirty-seven mobile homes and other structures sustained damage or were destroyed. Several larger trailers were pushed from their foundations and overturned.

### PROBABILITY OF FUTURE EVENTS

Due to the limited number of events reported for the City of Weslaco, the analysis focused on the reported events for Hidalgo County to reflect a greater probability for the planning area. This more accurately depicts the risk for the planning area based on the planning team and stakeholder accounts.

Tornadic storms can occur at any time of year and at any time of day, but they are typically more common in the spring months during the late afternoon and evening hours. A smaller, high

<sup>5</sup> Damages reported in 2020 dollars.

## SECTION 10: TORNADO

frequency period can emerge in the fall during the brief transition between the warm and cold seasons. According to historical records, Hidalgo County, including the City of Weslaco, can experience a tornado touchdown approximately once every year. This frequency supports a highly likely probability of future events for the City of Weslaco.

### VULNERABILITY AND IMPACT

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

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

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

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

The City of Weslaco planning area features multiple mobile or manufactured home parks throughout the planning area. These parks are typically more vulnerable to tornado events than typical site-built structures. In addition, manufactured homes are located sporadically throughout the planning area (outside of manufactured home parks) which would also be more vulnerable. The US Census data indicates a total of 3,036 manufactured homes located in the City of Weslaco planning area (19.6%, Table 10-6). In addition, 36% (approximately 5,597 of the single family residential (SFR) structures in the entire planning area were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant tornado events.

**Table 10-6. Structures at Greater Risk in the City of Weslaco**

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
City of Weslaco	3,234	5,428

While all citizens are at risk to the impacts of a tornado, forced relocation and disaster recovery drastically impacts low-income residents who lack the financial means to travel, afford a long-term stay away from home, and to rebuild or repair their homes. An estimated 26.1% of the planning area population live below the poverty level (Table 10-7).

## SECTION 10: TORNADO

**Table 10-7. Populations at Greatest Risk<sup>6</sup>**

JURISDICTION	POPULATION BELOW POVERTY LEVEL
City of Weslaco	10,289

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

**Table 10-8. Critical Facilities at Risk**

JURISDICTION	CRITICAL FACILITIES
City of Weslaco	1 Airport, 1 Police Station, 1 Government Facility, 4 Fire Stations, 5 Medical Facilities, 21 Schools, 1 College, 1 Public Works Department, 3 Water/Wastewater Treatment Facilities

The average loss estimate for the City of Weslaco for property and crop is \$48,596 (in 2020 dollars), having an approximate annual loss estimate of \$748 (Table 10-9). Based on historic loss and damages, the impact of tornado on the City of Weslaco planning area can be considered “Limited,” with less than 10 percent of property expected to be destroyed, injuries that can be treated with first aid, and critical facilities shut down for 24-hours or less.

**Table 10-9. Potential Annualized Losses**

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
City of Weslaco	\$48,596	\$748
Hidalgo County	\$27,005,052	\$415,462
<b>Planning Area</b>	<b>\$27,053,648</b>	<b>\$416,210</b>

### ASSESSMENT OF IMPACTS

Tornadoes have the potential to pose a significant risk to the population and can create dangerous situations. Often times, providing and preserving public health and safety is difficult. The impact of climate change could produce larger, more severe tornado events, exacerbating the current tornado impacts. More destructive tornado conditions can be frequently associated with a variety of impacts, including:

- Individuals exposed to the storm can be struck by flying debris, falling limbs, or downed trees causing serious injury or death.
- Structures can be damaged or crushed by falling trees, which can result in physical harm to the occupants.
- Manufactured homes may suffer substantial damage as they would be more vulnerable than typical site-built structures.

<sup>6</sup> US Census Bureau 2018 data for the City of Weslaco.

## SECTION 10: TORNADO

- Significant debris and downed trees can result in emergency response vehicles being unable to access areas of the community.
- Downed power lines may result in roadways being unsafe for use, which may prevent first responders from answering calls for assistance or rescue.
- Tornadoes often result in widespread power outages increasing the risk to more vulnerable portions of the population who rely on power for health and/or life safety.
- Extended power outages can result in an increase in structure fires and/or carbon monoxide poisoning as individuals attempt to cook or heat their home with alternate, unsafe cooking or heating devices, such as grills.
- Tornadoes can destroy or make residential structures uninhabitable, requiring shelter or relocation of residents in the aftermath of the event.
- First responders must enter the damage area shortly after the tornado passes to begin rescue operations and to organize cleanup and assessments efforts, therefore they are exposed to downed power lines, unstable and unusual debris, hazardous materials, and generally unsafe conditions, elevating the risk of injury to first responders and potentially diminishing emergency response capabilities.
- Emergency operations and services may be significantly impacted due to damaged facilities, loss of communications, and damaged emergency vehicles and equipment.
- City departments may be damaged or destroyed, delaying response and recovery efforts for the entire community.
- Private sector entities that the City and its residents rely on, such as utility providers, financial institutions, and medical care providers may not be fully operational and may require assistance from neighboring communities until full services can be restored.
- Economic disruption negatively impacts the programs and services provided by the community due to short- and long-term loss in revenue.
- Damage to infrastructure may slow economic recovery since repairs may be extensive and lengthy.
- Some businesses not directly damaged by the tornado may be negatively impacted while roads and utilities are being restored, further slowing economic recovery.
- When the community is affected by significant property damage it is anticipated that funding would be required for infrastructure repair and restoration, temporary services and facilities, overtime pay for responders, and normal day-to-day operating expenses.
- Displaced residents may not be able to immediately return to work, further slowing economic recovery.
- Residential structures destroyed by a tornado may not be rebuilt for years, reducing the tax base for the community.
- Large or intense tornadoes may result in a dramatic population fluctuation, as people are unable to return to their homes or jobs and must seek shelter and/or work outside of the affected area.
- Businesses that are uninsured or underinsured may have difficulty reopening, which results in a net loss of jobs for the community and a potential increase in the unemployment rate.

## SECTION 10: TORNADO

- Recreation activities may be unavailable, and tourism can be unappealing for years following a large tornado, devastating directly related local businesses.

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

# SECTION 11: DROUGHT

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## HAZARD DESCRIPTION

Drought is a period of time without substantial rainfall that persists from one year to the next. Drought is a normal part of virtually all climatic regions, including areas with high and low average rainfall. Drought is the consequence of anticipated natural precipitation reduction over an extended period of time, usually a season or more in length. Droughts can be classified as meteorological, hydrologic, agricultural, and socioeconomic. Table 11-1 presents definitions for these different types of drought.



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

**Table 11-1. Drought Classification Definitions<sup>1</sup>**

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

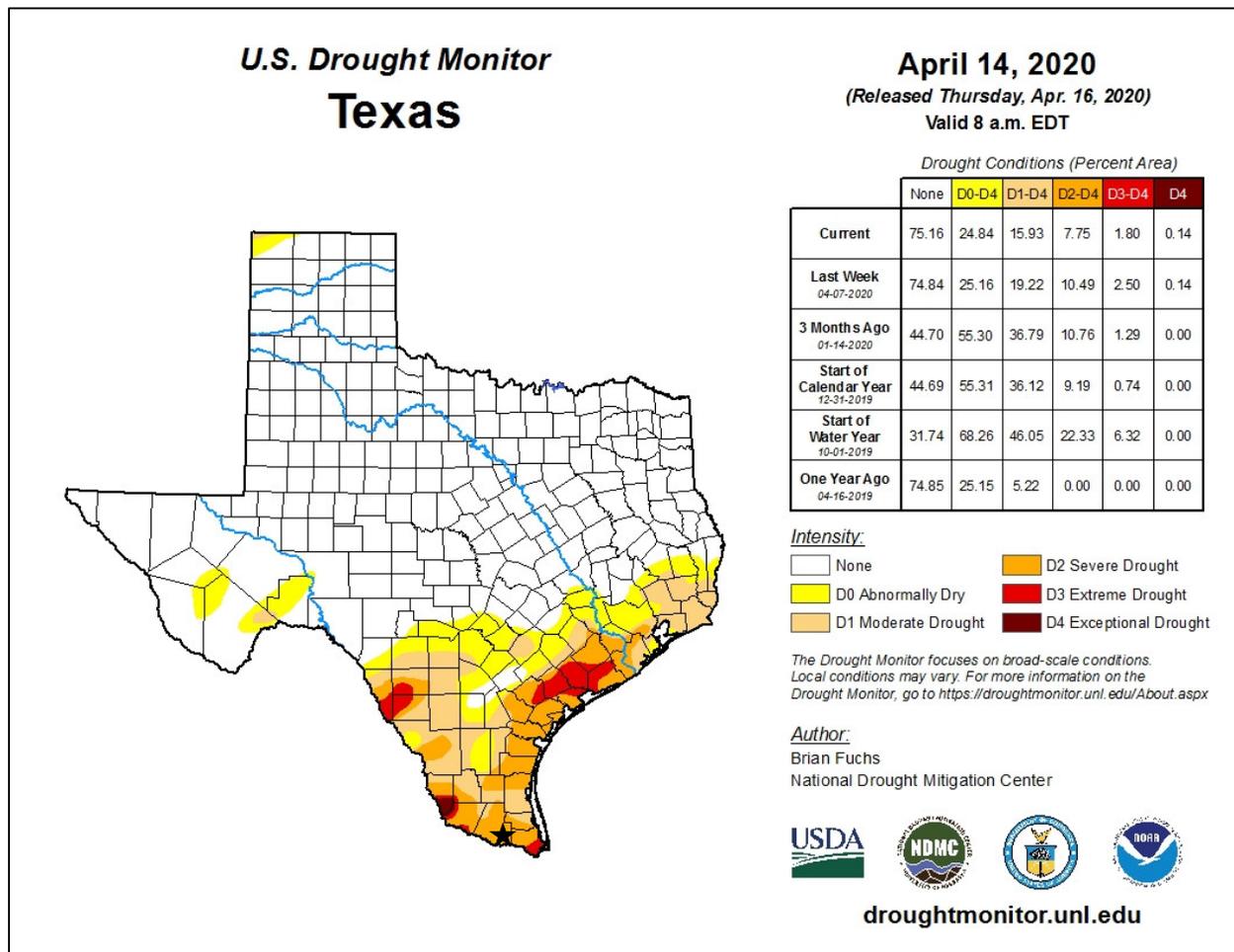
<sup>1</sup> Source: Multi-Hazard Identification and Risk Assessment: A Cornerstone of the National Mitigation Strategy, FEMA

# SECTION 11: DROUGHT

## LOCATION

Droughts occur regularly throughout Texas and the City of Weslaco planning area and are a normal condition. However, they can vary greatly in their intensity and duration. The Drought Monitor shows the planning area is currently experiencing severe drought conditions throughout the city (Figure 11-1). However, the planning area has experienced a range of conditions from normal to exceptional drought conditions over the last ten years (Figure 11-2). There is no distinct geographic boundary to drought; therefore, it can occur throughout the City of Weslaco planning area equally.

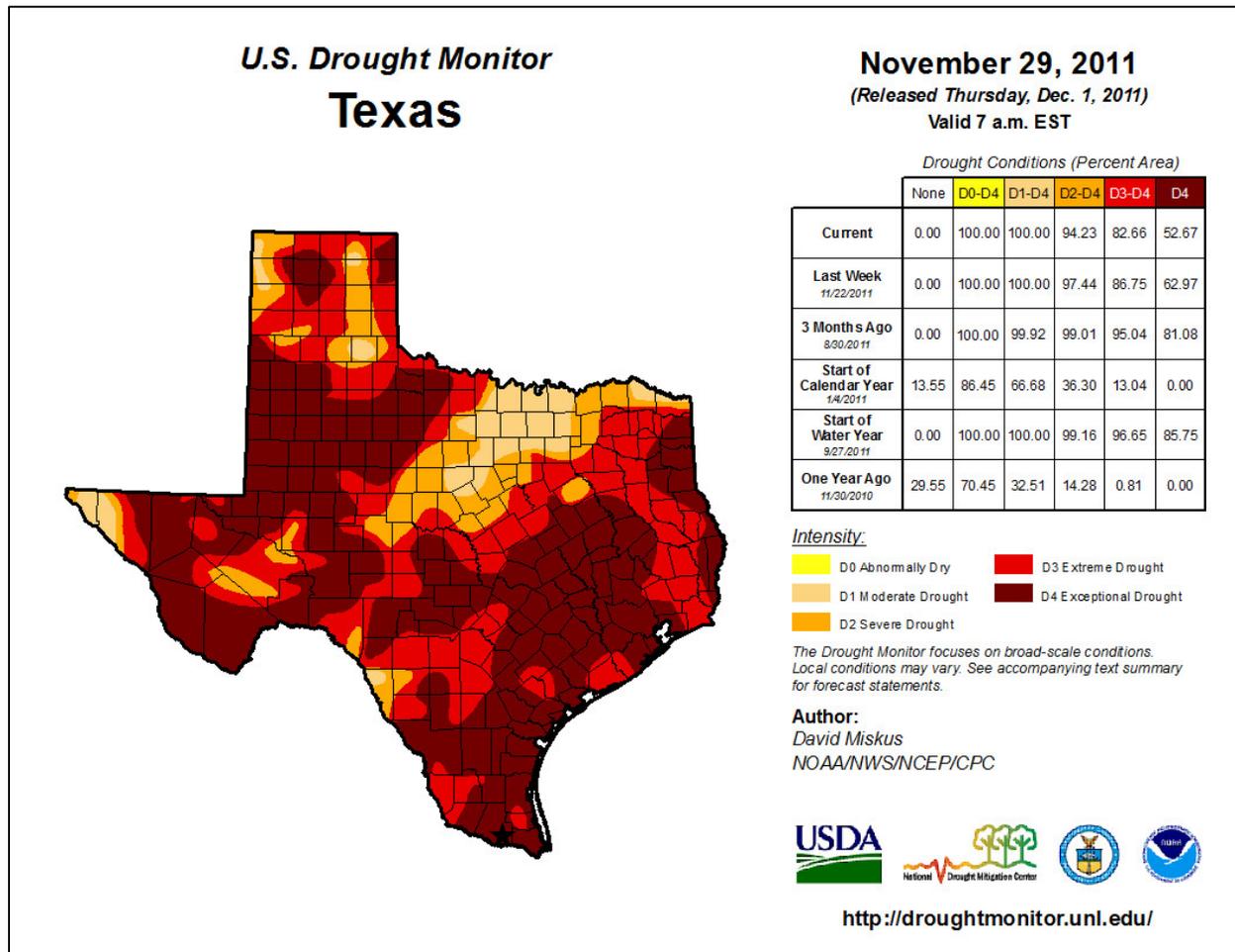
**Figure 11-1. U.S. Drought Monitor, April 2020<sup>2</sup>**



<sup>2</sup> The planning area is indicated by the black star.

# SECTION 11: DROUGHT

Figure 11-2. U.S. Drought Monitor, November 2011



## EXTENT

The Palmer Drought Index is used to measure the extent of drought by measuring the duration and intensity of long-term drought-inducing circulation patterns. Long-term drought is cumulative, with the intensity of drought during the current month dependent upon the current weather patterns plus the cumulative patterns of previous months. The hydrological impacts of drought (e.g., reservoir levels, groundwater levels, etc.) take longer to develop. Table 11-2 depicts magnitude of drought, while Table 11-3 describes the classification descriptions.

Table 11-2. Palmer Drought Index

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

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<b>Meteorological</b>	-4.00 and below	-3.00 to -3.99	-2.00 to -2.99	-1.99 to +1.99	+2.00 to +2.99	+3.00 to +3.99	+4.00 and above
<b>Hydrological</b>	-4.00 and below	-3.00 to -3.99	-2.00 to -2.99	-1.99 to +1.99	+2.00 to +2.99	+3.00 to +3.99	+4.00 and above

**Table 11-3. Palmer Drought Category Descriptions<sup>3</sup>**

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

Drought is monitored nationwide by the National Drought Mitigation Center (NDMC). Indicators are used to describe broad scale drought conditions across the U.S. and correspond to the intensity of drought. Drought incidents are reported at a county-wide level and are not available at the local jurisdiction area. Based on the historical occurrences for drought and the location of the City of Weslaco planning area the area can anticipate a range of drought from abnormally dry to exceptional, or D0 to D4, based on the Palmer Drought Category. The entire planning area has experienced exceptional drought conditions. This is the most extreme drought conditions the planning area can anticipate in the future.

### HISTORICAL OCCURRENCES

The City of Weslaco planning area may typically experience a severe drought. Table 11-4 lists historical events that have occurred in Hidalgo County as reported in the National Centers for

<sup>3</sup> Source: National Drought Mitigation Center

## SECTION 11: DROUGHT

Environmental Information (NCEI). Historical drought information, as provided by the NCEI, shows drought activity across a multi-county forecast area for each event; therefore, the drought data for the City of Weslaco is included with the Hidalgo County data. Historical events with reported damages, injuries, or fatalities are shown in Table 11-5. A total of 137 reported historical drought events impacted Hidalgo County, including the City of Weslaco planning area between 1996 through November 2019 (Summary Table 11-6). The reported events cover fifteen unique drought periods.

Historical drought information shows drought activity across a multi-county forecast area for each event, the appropriate percentage of the total property and crop damage reported for the entire forecast area has been allocated to each county impacted by the event. Historical drought data for the City of Weslaco planning area is provided on a county-wide basis per the NCEI database.

**Table 11-4. Historical Drought Years, 1996-2019<sup>4</sup>**

DROUGHT YEAR
1996
2000-2001
2001-2002
2002
2003
2008
2009
2010-2011
2011-2012
2012-2013
2014 <sup>5</sup>
2017
2018 <sup>6</sup>
<b>15 unique events</b>

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<sup>4</sup> Historical data is reported from January 1996 through November 2019.

<sup>5</sup> There were two unique events reported for this year.

<sup>6</sup> There were two unique events reported for this year.

## SECTION 11: DROUGHT

**Table 11-5. Historical Drought Events, 1996-2019<sup>7</sup>**

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE <sup>8</sup>
Hidalgo County	1/1/2001	0	0	\$0	\$134,823
Hidalgo County	6/1/2011	0	0	\$0	\$46,766
Hidalgo County	8/16/2011	0	0	\$0	\$49,667
<b>TOTALS</b>		<b>0</b>	<b>0</b>	<b>\$0</b>	<b>\$231,256</b>

**Table 11-6. Historical Drought Events Summary, 1996-2019**

JURISDICTION	NUMBER of EVENTS	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
City of Weslaco	137	0	0	\$0	\$231,256

### SIGNIFICANT EVENTS

#### March 2011- December 2011

Dry conditions continued across portions of Deep South Texas in March. The dry conditions intensified to severe drought (D2) conditions across western and southwestern portions of the Rio Grande Valley in early March 2011.

The latter half of August saw Drought conditions deteriorate, a result of days of heat and wind after the first, which continued for most days until month's end - with only a few periods of welcome rainfall, particularly on the August 26th and again on the 31st. Crop impacts were fully realized by the end of August, when a combination of crop damage with production loss of cotton, corn, and sorghum totaled more \$25 million (preliminary insured) for the Rio Grande Valley as a whole. This was an increase of more than \$17 million from the preliminary numbers (\$8.8 million) which were largely realized during the late spring (May/June).

### PROBABILITY OF FUTURE EVENTS

Based on available records of historic events, there have been fifteen extended time periods of drought (ranging in length from approximately 30 days to over 510 days) within a 24-year reporting period, which provides a probability of one event every one to two years. This frequency supports a highly likely probability of future events. The City of Weslaco events are included under the County.

<sup>7</sup> Only historical events with reported injuries, fatalities or damages are listed. Values are reported in 2020 dollars.

<sup>8</sup> Countywide damages have been adjusted to reflect only a percentage (0.93%) of the damages attributed to the City of Weslaco.

## SECTION 11: DROUGHT

### VULNERABILITY AND IMPACT

Loss estimates were based on 24 years of statistical data from the NCEI. A drought event frequency-impact was then developed to determine an impact profile on agriculture products and estimate potential losses due to drought in the area. Table 11-7 shows annualized exposure.

**Table 11-7. Potential Annualized Losses for City of Weslaco**

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATES
City of Weslaco	\$231,256	\$9,636

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

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

The average person will survive only a few days without potable water, and this timeframe can be drastically shortened for those people with more fragile health – typically children, the elderly, and the ill. Population over 65 in the City of Weslaco planning area is estimated at 14.7% of the total population, and children under the age of 5 are estimated at 10.3% or an estimated total of 9,865<sup>9</sup> potentially vulnerable residents in the planning area based on age. In addition, an estimated 26.1% of the planning area population live below the poverty level (Table 11-8) which may contribute to overall health impacts of a drought.

**Table 11-8. Populations at Greater Risk**

JURISDICTION	POPULATION 65 AND OLDER	POPULATION UNDER 5	POPULATION BELOW POVERTY LEVEL
City of Weslaco	5,790	4,075	10,289

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

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<sup>9</sup> US Census Bureau 2018 data for City of Weslaco

## SECTION 11: DROUGHT

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

Impact of droughts experienced in the City of Weslaco planning area has resulted in no injuries or fatalities supporting a “Limited” severity of impact meaning injuries and/or illnesses are treatable with first aid, shutdown of facilities and services for 24 hours or less, and less than 10% of property is destroyed or with major damage. Annualized loss over the 24-year reporting period in Hidalgo County, including the City of Weslaco, is estimated to be \$1,036,095.

### ASSESSMENT OF IMPACTS

The Drought Impact Reporter was developed in 2005 by the University of Nebraska-Lincoln to provide a national database of drought impacts. Droughts can have an impact on: the agriculture; business and industry; energy; fire; plants and wildlife; relief, response, and restrictions; society and public health; tourism and recreation; and water supply and quality. The reports are submitted from individuals from Federal, State, and local agencies, as well as the general public. Table 11-9 lists the drought impacts to Hidalgo County from 2005 through December 2019 based on reports received by the Drought Impact Reporter.

**Table 11-9. Drought Impacts, 2005-2019**

DROUGHT IMPACTS 2005-2019	
Agriculture	93
Business & Industry	1
Energy	1
Fire	18
Plants & Wildlife	50
Relief, Response & Restrictions	52
Society & Public Health	5
Tourism & Recreation	0
Water Supply & Quality	48

Drought has the potential to impact people in Hidalgo County, including the City of Weslaco planning area. While it is rare that drought, in and of itself, leads to a direct risk to the health and safety of people in the U.S., severe water shortages could result in inadequate supply for human needs. The impact of climate change could produce longer, more severe droughts, exacerbating the current drought impacts. Worsening drought conditions can be frequently associated with a variety of impacts, including:

- The number of health-related low-flow issues (e.g., diminished sewage flows, increased pollution concentrations, reduced firefighting capacity, and cross-connection contamination) will increase as the drought intensifies.

## SECTION 11: DROUGHT

- Public safety from forest/range/wildfires will increase as water availability and/or pressure decreases.
- Respiratory ailments may increase as the air quality decreases.
- There may be an increase in disease due to wildlife concentrations (e.g., rabies, Rocky Mountain spotted fever, Lyme disease).
- Jurisdictions and residents may disagree over water use/water rights, creating conflict.
- Political conflicts may increase between municipalities, counties, states, and regions.
- Water management conflicts may arise between competing interests.
- Increased law enforcement activities may be required to enforce water restrictions.
- Severe water shortages could result in inadequate supply for human needs as well as lower quality of water for consumption.
- Firefighters may have limited water resources to aid in firefighting and suppression activities, increasing risk to lives and property.
- During drought there is an increased risk for wildfires and dust storms.
- The community may need increased operational costs to enforce water restriction or rationing.
- Prolonged drought can lead to increases in illness and disease related to drought.
- Utility providers can see decreases in revenue as water supplies diminish.
- Utilities providers may cut back energy generation and service to their customers to prioritize critical service needs.
- Hydroelectric power generation facilities and infrastructure would have significantly diminished generation capability. Dams simply cannot produce as much electricity from low water levels as they can from high water levels.
- Fish and wildlife food and habitat will be reduced or degraded over time during a drought and disease will increase, especially for aquatic life.
- Wildlife will move to more sustainable locations creating higher concentrations of wildlife in smaller areas, increasing vulnerability and further depleting limited natural resources.
- Severe and prolonged drought can result in the reduction of a species or cause the extinction of a species altogether.
- Plant life will suffer from long-term drought. Wind and erosion will also pose a threat to plant life as soil quality will decline.
- Dry and dead vegetation will increase the risk of wildfire.
- Drought poses a significant risk to annual and perennial crop production and overall crop quality leading to higher food costs.
- Drought related declines in production may lead to an increase in unemployment.
- Drought may limit livestock grazing resulting in decreased livestock weight, potential increased livestock mortality, and increased cost for feed.
- Negatively impacted water suppliers may face increased costs resulting from the transport water or develop supplemental water resources.
- Long term drought may negatively impact future economic development.

## SECTION 11: DROUGHT

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

# SECTION 12: HAIL

- Hazard Description ..... 1
- Location ..... 1
- Extent ..... 1
- Historical Occurrences ..... 3
  - Significant Events ..... 5
- Probability of Future Events ..... 5
- Vulnerability and Impact ..... 6
  - Assessment of Impacts ..... 7

## HAZARD DESCRIPTION



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

## LOCATION

Hailstorms are an extension of severe thunderstorms that could potentially cause severe damage. As a result, they are not confined to any specific geographic location and can vary greatly in size, location, intensity, and duration. Therefore, the City of Weslaco planning area is equally at risk to the hazard of hail.

## EXTENT

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

## SECTION 12: HAIL

**Table 12-1. Hail Intensity and Magnitude<sup>1</sup>**

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

The intensity scale in Table 12-1 ranges from H0 to H10, with increments of intensity or damage potential in relation to hail size (distribution and maximum), texture, fall speed, speed of storm translation, and strength of the accompanying wind. Based on available data regarding the previous occurrences for the area, Hidalgo County, including the City of Weslaco planning area, may experience hailstorms ranging from an H0 to an H10. The City of Weslaco can mitigate a storm from low risk or hard hail to a super hailstorm with baseball size hail that leads to extensive structural damage and could cause fatal injuries. The largest hail event in or near the City of Weslaco planning area resulted in hail measuring 4.5 inches in diameter, or a H10, Super Hailstorm. This is the worst extent the planning area can anticipate in the future. Due to the limited number of events reported for the City of Weslaco, the analysis focused on the reported events for Hidalgo County to reflect a greater probability for the planning area.

<sup>1</sup> NCEI Intensity Scale, based on the TORRO Hailstorm Intensity Scale.

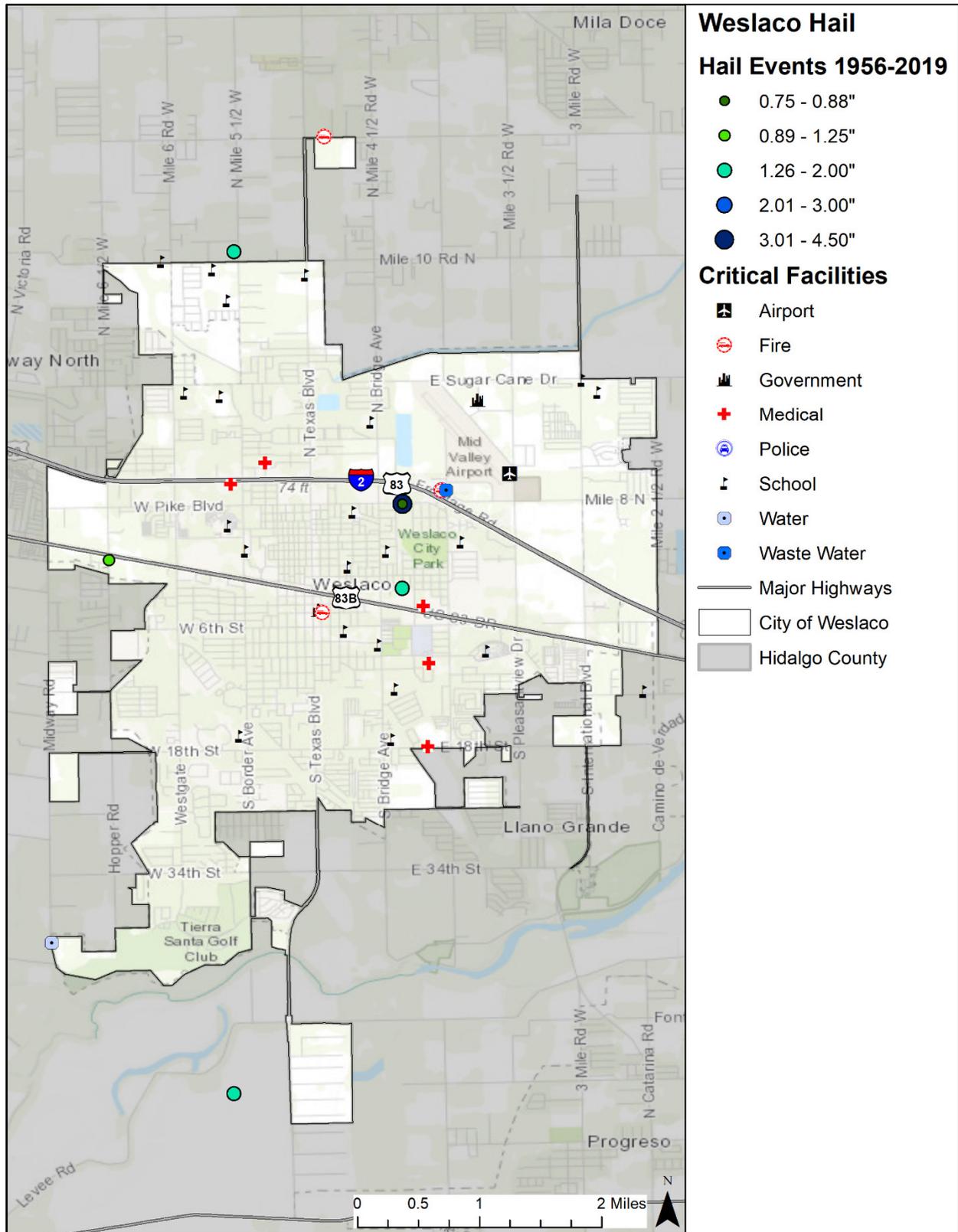
## SECTION 12: HAIL

### HISTORICAL OCCURRENCES

Historical evidence shown in Figure 12-1 demonstrates that the planning area is vulnerable to hail events overall, which typically result from severe thunderstorm activity. Historical events with reported damages, injuries, or fatalities are shown in Table 12-2. A total of 114 reported historical hail events impacted Hidalgo County, including the City of Weslaco planning area, from January 1956 through November 2019 (Summary Table 12-3). These events were reported to NCEI and NOAA databases and may not represent all hail events to have occurred during the past 64 years. Only those events for the planning area with latitude and longitude available were plotted (Figure 12-1).

# SECTION 12: HAIL

## Figure 12-1. Spatial Historical Hail Events, 1956-2019



## SECTION 12: HAIL

**Table 12-2. Historical Hail Events, 1956-2019<sup>2</sup>**

JURISDICTION	DATE	MAGNITUDE	INJURIES	FATALITIES	PROPERTY DAMAGE <sup>3</sup>	CROP DAMAGE
Hidalgo County	4/29/1991	4.5	1	0	\$0	\$0
City of Weslaco	3/9/1994	1	0	0	\$8,763	\$8,763
Hidalgo County	3/29/2012	2.75	0	0	\$2,091,730	\$10,459
Hidalgo County	4/20/2012	2.75	0	0	\$104,271	\$0
Hidalgo County	3/26/2015	1.75	0	0	\$10	\$0
Hidalgo County	3/26/2015	1.5	0	0	\$15	\$0
<b>TOTALS</b>		<b>(Max Extent)</b>	<b>1</b>	<b>0</b>	<b>\$2,224,011</b>	

**Table 12-3. Historical Hail Events Summary, 1956-2018**

JURISDICTION	NUMBER of EVENTS	MAGNITUDE	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE
City of Weslaco	6	1.5 inches	0	0	\$8,763	\$8,763
Hidalgo County	108	4.5 inches	1	0	\$2,196,027	\$10,459
<b>TOTAL LOSSES</b>	<b>114</b>	<b>(Max Extent)</b>	<b>1</b>	<b>0</b>	<b>\$2,224,011</b>	

### SIGNIFICANT EVENTS

#### March 29, 2012

Intense thunderstorms raked the area of Hidalgo County during the mid-evening of March 29th. The storms dumped hail up to the size of baseballs for more than half an hour, hail with 70 to 75 mph winds, added 4 to 6 inches of torrential rains, and produced frequent cloud to ground lightning. Initial storms developed across the King Ranch during the midafternoon of March 29th and spread west into northern Hidalgo and Starr County by early evening.

Damage totals have reached an estimated \$200 million in property and crop damage. Updated tallies will be provided as information is received.

### PROBABILITY OF FUTURE EVENTS

Due to the limited number of events reported for the City of Weslaco, the analysis focused on the reported events for Hidalgo County to reflect a greater probability for the planning area. Based on available records of historic events, 114 events in a 64-year reporting period for Hidalgo County, including the City of Weslaco planning area, provides a probability of one to two events per year.

<sup>2</sup> Only recorded events with fatalities, injuries, and/or damages are listed.

<sup>3</sup> Countywide damages have been adjusted to reflect only a percentage (0.93%) of the damages attributed to the City of Weslaco.

## SECTION 12: HAIL

This frequency supports a highly likely probability of future events for the City of Weslaco planning area.

### VULNERABILITY AND IMPACT

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

Utility systems on roofs at schools throughout the district and critical facilities would be vulnerable and could be damaged. Hail could cause a significant threat to people as they could be struck by hail and falling trees and branches. Outdoor activities and events may elevate the risk to residents and visitors when a hailstorm strikes with little warning. Portable buildings typically utilized by schools and commercial sites such as construction areas would be more vulnerable to hail events than the typical site-built structures.

The City of Weslaco planning area features mobile or manufactured home parks throughout the planning area. These parks are typically more vulnerable to hail events than typical site-built structures. In addition, manufactured homes are located sporadically throughout the planning area which would also be more vulnerable. The US Census data indicates a total of 3,036 (19.6%) manufactured homes located in the City of Weslaco planning area (Table 12-4). In addition, 36.0 (approximately 5,597 structures) of the single family residential (SFR) structures in the City of Weslaco planning area were built before 1980. These structures would typically be built to lower or less stringent construction standards than newer construction and may be more susceptible to damages during significant hail events.

**Table 12-4. Structures at Greater Risk**

JURISDICTION	MANUFACTURED HOMES	SFR STRUCTURES BUILT BEFORE 1980
City of Weslaco	3,234	5,428

While all citizens are at risk to the impacts of a hail event, forced relocation and disaster recovery drastically impacts low-income residents who lack the financial means to travel, afford a long-term stay away from home, and to rebuild or repair their homes. An estimated 26.1% of the planning area population live below the poverty level (Table 12-5).

**Table 12-5. Populations at Greatest Risk<sup>4</sup>**

JURISDICTION	POPULATION BELOW POVERTY LEVEL
City of Weslaco	10,289

The following critical facilities would be vulnerable to hail events in the City of Weslaco:

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<sup>4</sup> US Census Bureau 2018 data for the City of Weslaco.

## SECTION 12: HAIL

**Table 12-6. Critical Facilities at Risk**

JURISDICTION	CRITICAL FACILITIES
City of Weslaco	1 Airport, 1 Police Station, 1 Government Facility, 4 Fire Stations, 5 Medical Facilities, 21 Schools, 1 College, 1 Public Works Department, 3 Water/Wastewater Treatment Facilities

Hail has been known to cause injury to humans and occasionally has been fatal. Overall, the average loss estimate of property and crops (in 2020 dollars) is \$2,224,011, having an approximate annual loss estimate of \$34,750. Based on historic loss and damages, the impact of hail damages on the City of Weslaco planning area can be considered “Limited” severity of impact meaning injuries and illness can be treated with first-aid, area facilities are shut down for 24-hours or less, and less than ten percent of property destroyed or with major damage.

**Table 12-7. Potential Annualized Losses**

JURISDICTION	PROPERTY & CROP LOSS	ANNUAL LOSS ESTIMATE
City of Weslaco	\$17,526	\$274
Hidalgo County	\$2,206,486	\$34,476
<b>TOTALS</b>	<b>\$2,224,011</b>	<b>\$34,750</b>

### ASSESSMENT OF IMPACTS

Hail events have the potential to pose a significant risk to people and can create dangerous situations. The impact of climate change could produce larger, more severe hail events, exacerbating the current hail impacts. Worsening hail conditions can be frequently associated with a variety of impacts, including:

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

## SECTION 12: HAIL

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

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

# SECTION 13: WILDFIRE

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- Hazard Description ..... 1
- Location ..... 1
- Extent ..... 3
- Historical Occurrences ..... 7
- Probability of Future Events ..... 9
- Vulnerability and Impact..... 9
  - Assessment of Impacts.....12

## HAZARD DESCRIPTION

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

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

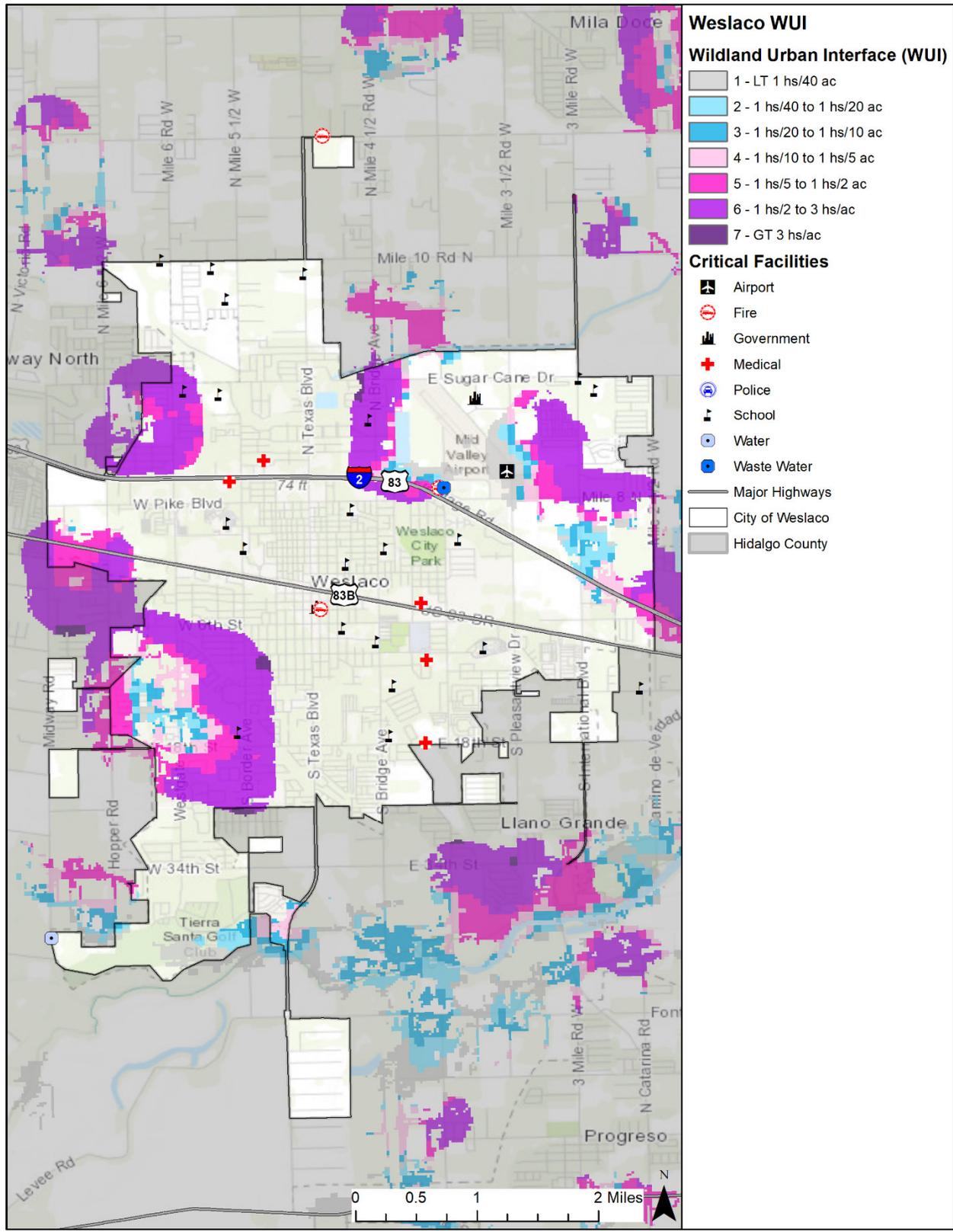
Texas has seen a significant increase in the number of wildfires in the past 30 years, which included wildland, interface, or intermix fires. Wildland fires are fueled almost exclusively by natural vegetation, while interface or intermix fires are urban/wildland fires in which vegetation and the built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

## LOCATION

A wildfire event can be a potentially damaging consequence of drought. Wildfires can vary greatly in terms of size, location, intensity, and duration. While wildfires are not confined to any specific geographic location, they are most likely to occur in open grasslands. The threat to people and property from a wildfire event is greater in the fringe areas where developed areas meet open grass lands, such as the Wildland Urban Interface (WUI). (Figure 13-1). It is estimated that 17.2 percent of the total population in the City of Weslaco live within the WUI, the greatest area of risk. However, the entire City of Weslaco planning area is at some risk for wildfires.

# SECTION 13: WILDFIRE

## Figure 13-1. Wildland Urban Interface Map – City of Weslaco



# SECTION 13: WILDFIRE

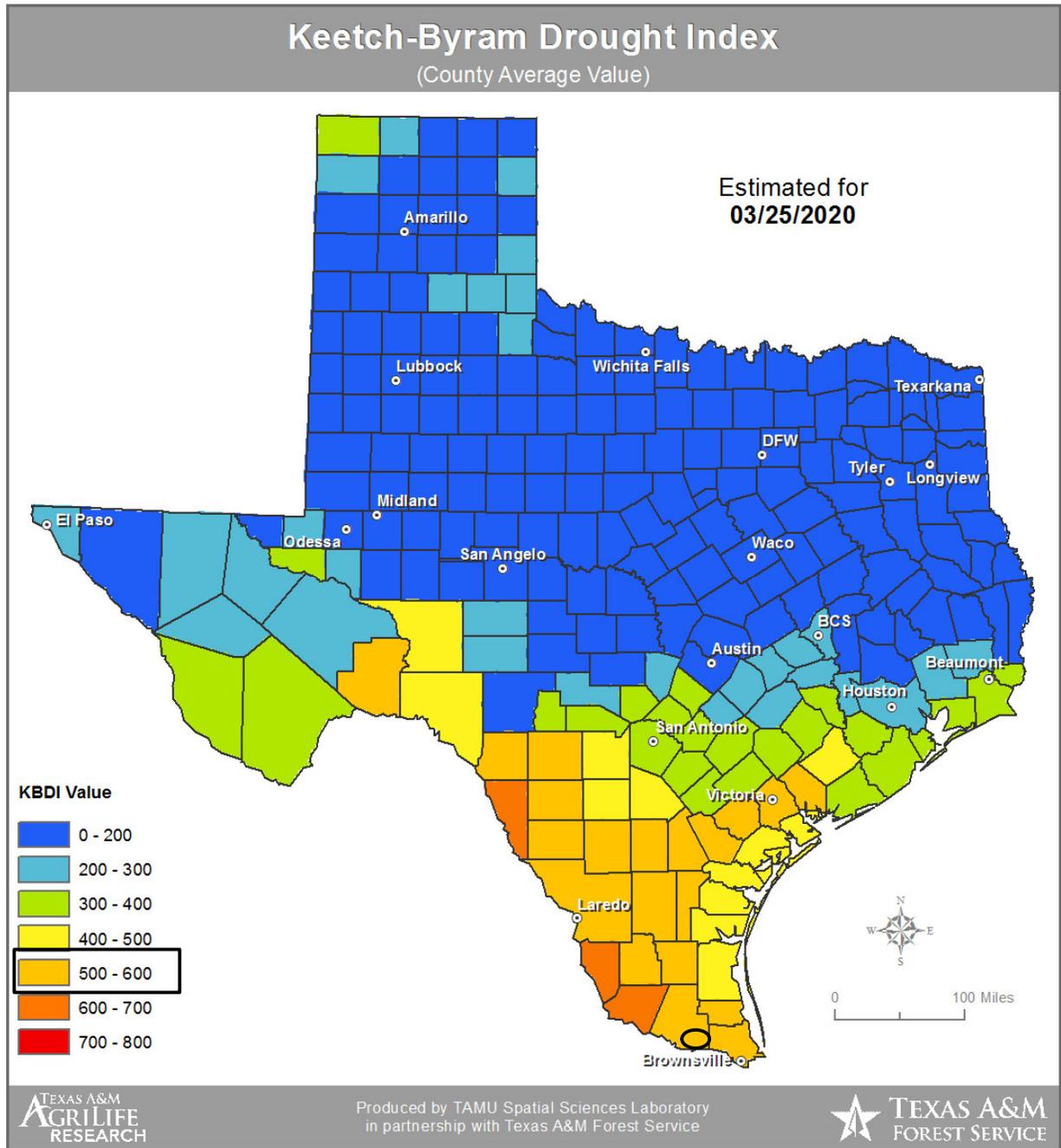
## EXTENT



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

# SECTION 13: WILDFIRE

Figure 13-2. Keetch-Byram Drought Index (KBDI) for the State of Texas, 2020<sup>1</sup>



<sup>1</sup> City of Weslaco is located within the black circle.

## SECTION 13: WILDFIRE

Fire behavior can be categorized at four distinct levels on the Keetch-Byram Drought Index (KBDI):

- **0 -200:** Soil and fuel moisture are high. Most fuels will not readily ignite or burn. However, with sufficient sunlight and wind, cured grasses and some light surface fuels will burn in spots and patches.
- **200 -400:** Fires more readily burn and will carry across an area with no gaps. Heavier fuels will not readily ignite and burn. Expect smoldering and the resulting smoke to carry into and possibly through the night.
- **400 -600:** Fires intensity begins to significantly increase. Fires will readily burn in all directions exposing mineral soils in some locations. Larger fuels may burn or smolder for several days creating possible smoke and control problems.
- **600 -800:** Fires will burn to mineral soil. Stumps will burn to the end of underground roots and spotting will be a major problem. Fires will burn through the night and heavier fuels will actively burn and contribute to fire intensity.

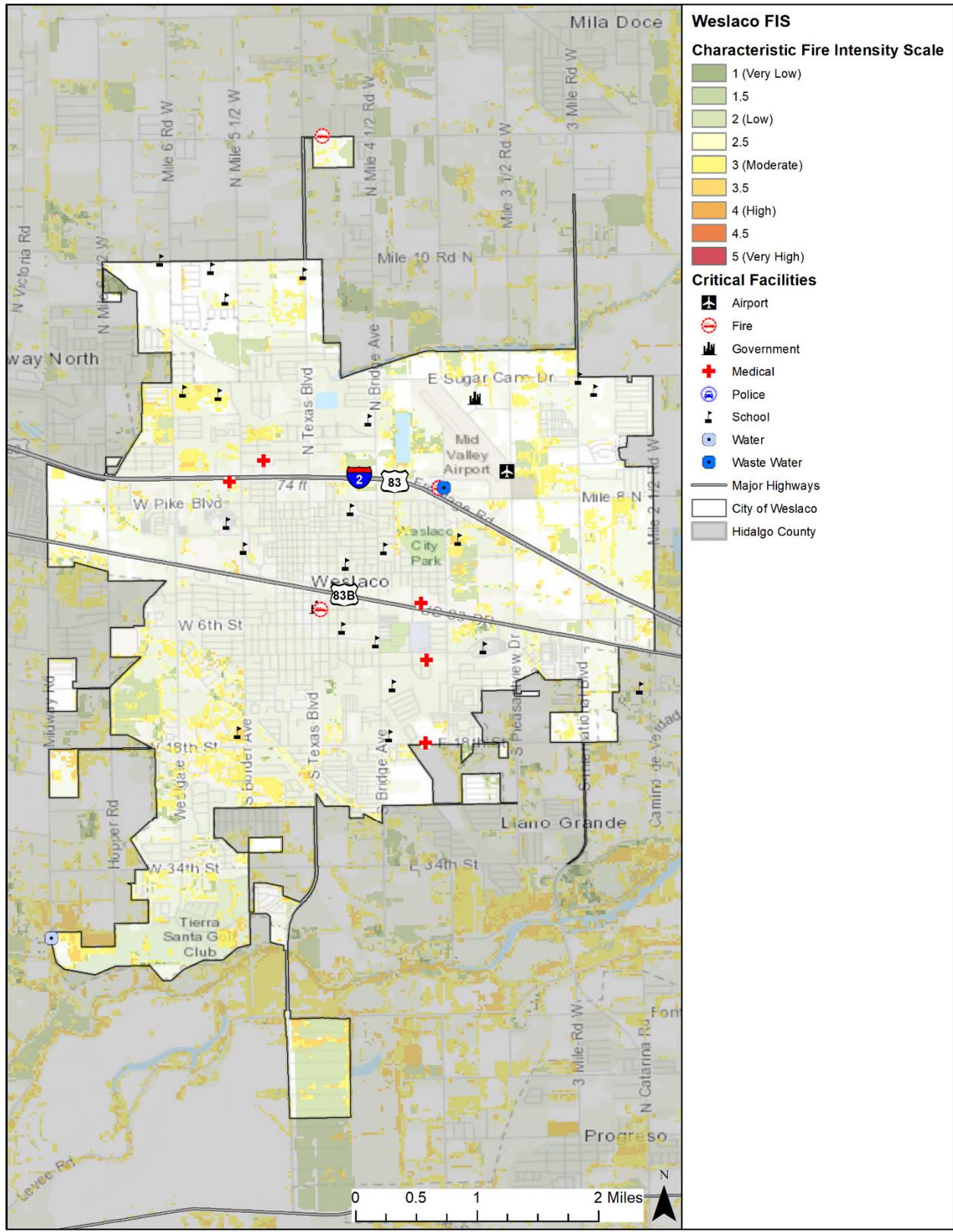
The KBDI is a good measure of the readiness of fuels for a wildfire event. It should be referenced as the area experiences changes in precipitation and soil moisture, while caution should be exercised in dryer, hotter conditions.

The range of intensity for the City of Weslaco planning area in a wildfire event is within 245 to 640. The average extent to be mitigated for the City of Weslaco planning area is a KBDI of 543. At this level fires intensity begins to significantly increase. Fire will readily burn in all directions exposing mineral soils in some locations. The worst the planning area can anticipate based on historical occurrences and readily available fuel is 600 to 800 as 640 falls within this range. At this level fires will burn to mineral soil. Stumps will burn to the end of underground roots and spotting will be a major problem. Fires will burn through the night and heavier fuels will actively burn and contribute to fire intensity.

The Texas Forest Service's Fire Intensity Scale identifies areas where significant fuel hazards and associated dangerous fire behavior potential exist based on weighted average of four percentile weather categories. The City of Weslaco is between a potential limited to low wildfire intensities. Figure 13-3 identifies the wildfire intensity for the City of Weslaco planning area.

# SECTION 13: WILDFIRE

## Figure 13-3. Fire Intensity Scale Map – City of Weslaco



## SECTION 13: WILDFIRE

### HISTORICAL OCCURRENCES

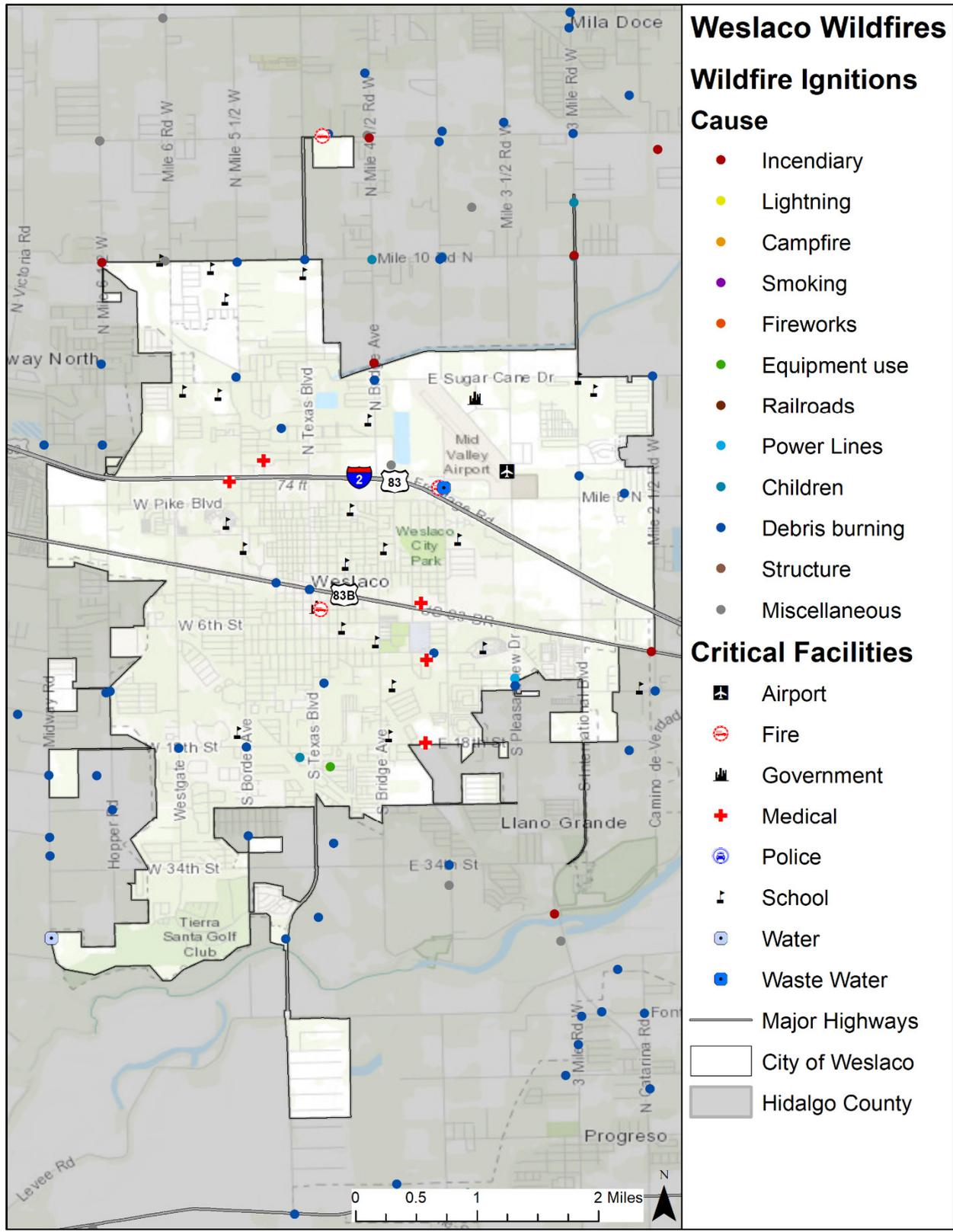
The Texas Forest Service reported 29 wildfire events between 2005 and 2015. The National Center for Environmental Information (NCEI) did not have any reported events from 1996 through November 2019 for the City of Weslaco. Due to a lack of recorded data for wildfire events prior to 2005 and after 2015<sup>2</sup>, frequency calculations are based on an eleven-year period using only data from recorded years. The map below shows approximate locations of wildfires, which can be grass or brushfires of any size (Figure 13-4). Table 13-1 identifies the number of wildfires and total acreage burned for the planning area.

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<sup>2</sup> The Texas Forest Service data is currently only available through 2015.

# SECTION 13: WILDFIRE

Figure 13-4. Location and Historic Wildfire Events for City of Weslaco Planning Area



## SECTION 13: WILDFIRE

**Table 13-1. Historical Wildfire Events Summary**

JURISDICTION	NUMBER OF EVENTS	ACRES BURNED
City of Weslaco	29	3,686

**Table 13-2. Acreage of Suppressed Wildfire by Year**

JURISDICTION	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
City of Weslaco	0	9	0	0	0	0	3,624	52	0	1	0

### PROBABILITY OF FUTURE EVENTS

Wildfires can occur at any time of the year. As the city moves towards its jurisdictional boundaries and approaches wildland, the potential area of occurrence of wildfire increases. With 29 events in an 11-year period, an event within City of Weslaco is highly likely, meaning an event is probable within the next year.

### VULNERABILITY AND IMPACT

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

The heavily populated, urban areas of the City of Weslaco are not likely to experience large, sweeping fires. Unoccupied buildings and open spaces that have not been maintained have the greatest vulnerability to wildfire. The overall level of concern for wildfires is located mostly along the perimeter of the study area where wildland and urban areas interface. Figure 13-1 illustrates the areas that are the most vulnerable to wildfire throughout the planning area.

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

**Table 13-3. Critical Facilities Located in WUI**

JURISDICTION	CRITICAL FACILITIES
City of Weslaco	1 Airport, 3 Schools

Within the City of Weslaco, a total of 29 fire events were reported from 2005 to 2015. All of these events were suspected wildfires. Historic loss and annualized estimates due to wildfires are presented in Table 13-4 below. The frequency is approximately two to three events every year.

SECTION 13: WILDFIRE

Table 13-4. Potential Annualized Losses<sup>3</sup>

JURISDICTION	ACRES BURNED	ANNUAL ACRE LOSSES
City of Weslaco	3,686	335.1

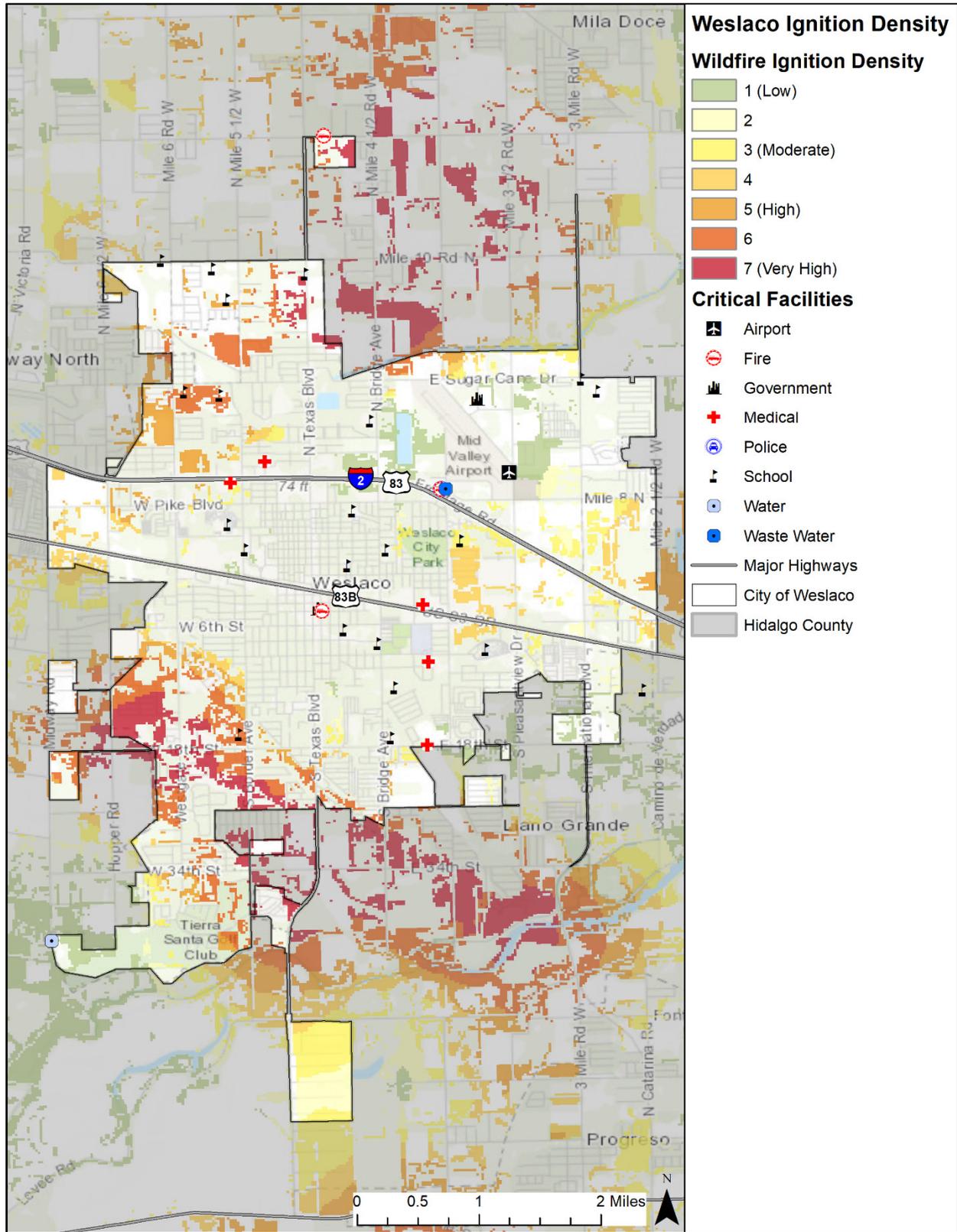
Figure 13-5 shows the City of Weslaco and the threat of wildfire to the planning area.

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<sup>3</sup> Events divided by 11 years of data.

SECTION 13: WILDFIRE

Figure 13-5. Wildfire Ignition Density – City of Weslaco



## SECTION 13: WILDFIRE

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

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

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

For the City of Weslaco planning area, the impact from a wildfire event can be considered "Limited," meaning injuries and/or illnesses are treatable with first aid, shutdown of facilities and services for 24 hours or less, and less than 10 percent of property is destroyed or with major damage. Severity of impact is gauged by acreage burned, homes and structures lost, injuries and fatalities.

### ASSESSMENT OF IMPACTS

A Wildfire event poses a potentially significant risk to public health and safety, particularly if the wildfire is initially unnoticed and spreads quickly. The impacts associated with a wildfire are not limited to the direct damages. The impact of climate change could produce larger, more widespread wildfire events, exacerbating the current wildfire impacts. More extreme wildfire conditions can be frequently associated with a variety of impacts, including:

- Persons in the area at the time of the fire are at risk for injury or death from burns and/or smoke inhalation.
- First responders are at greater risk of physical injury since they are in close proximity to the hazard while extinguishing flames, protecting property or evacuating residents in the area.
- First responders can experience heart disease, respiratory problems, and other long-term related illnesses from prolonged exposure to smoke, chemicals, and heat.
- Emergency services may be disrupted during a wildfire if facilities are impacted, roadways are inaccessible, or personnel are unable to report for duty.
- Critical city and/or county departments may not be able to function and provide necessary services depending on the location of the fire and the structures or personnel impacted.
- Non-critical businesses may be directly damaged, suffer loss of utility services, or be otherwise inaccessible, delaying normal operations and slowing the recovery process.
- Displaced residents may not be able to immediately return to work, further slowing economic recovery.
- Roadways in or near the WUI could be damaged or closed due to smoke and limited visibility.

## SECTION 13: WILDFIRE

- Older homes are generally exempt from modern building code requirements, which may require fire suppression equipment in the structure.
- Some high-density neighborhoods feature small lots with structures close together, increasing the potential for fire to spread rapidly.
- Air pollution from smoke may exacerbate respiratory problems of vulnerable residents.
- Charred ground after a wildfire cannot easily absorb rainwater, increasing the risk of flooding and potential mudflows.
- Wildlife may be displaced or destroyed.
- Historical or cultural resources may be damaged or destroyed.
- Tourism can be significantly disrupted, further delaying economic recovery for the area.
- Vegetated dunes can be stripped, significantly damaging the function of the dunes to protect inland areas from the destructive forces of wind and waves.
- Economic disruption negatively impacts the programs and services provided by the community due to short- and long-term loss in revenue.
- Fire suppression costs can be substantial, exhausting the financial resources of the community.
- Residential structures lost in a wildfire may not be rebuilt for years, reducing the tax base for the community.
- Area recreation such as Las Palomas Wildlife Management Center and Fronteras Audubon Society, recreation and tourism can be unappealing for years following a large wildfire, devastating directly related businesses.
- Direct impacts to municipal water supply may occur through contamination of ash and debris during the fire, destruction of aboveground delivery lines, and soil erosion or debris deposits into waterways after the fire.

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

# SECTION 14: WINTER STORM

- Hazard Description ..... 1
- Location ..... 3
- Extent ..... 3
- Historical Occurrences ..... 4
  - Significant Events ..... 5
- Probability of Future Events ..... 5
- Vulnerability and Impact ..... 5
  - Assessment of Impacts ..... 6

## HAZARD DESCRIPTION



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

Winter storms that threaten the City of Weslaco planning area usually begin as powerful cold fronts that push south from central Canada. Although the county is at risk to ice hazards, extremely cold temperatures, and snow, the effects and frequencies of winter storm events are generally mild and short-lived. As indicated in Figure 14-1, on average, the City of Weslaco planning area typically experience approximately 1-10 extreme cold days a year, meaning up to 10 days are at or around freezing temperatures. During times of ice and snow accumulation, response times will increase until public works road crews are able to make major roads passable. Table 14-1 describes the types of winter storms possible to occur in the City of Weslaco planning area.

## SECTION 14: WINTER STORM

Figure 14-1. Extreme Cold Days, 1960-2003<sup>1</sup>

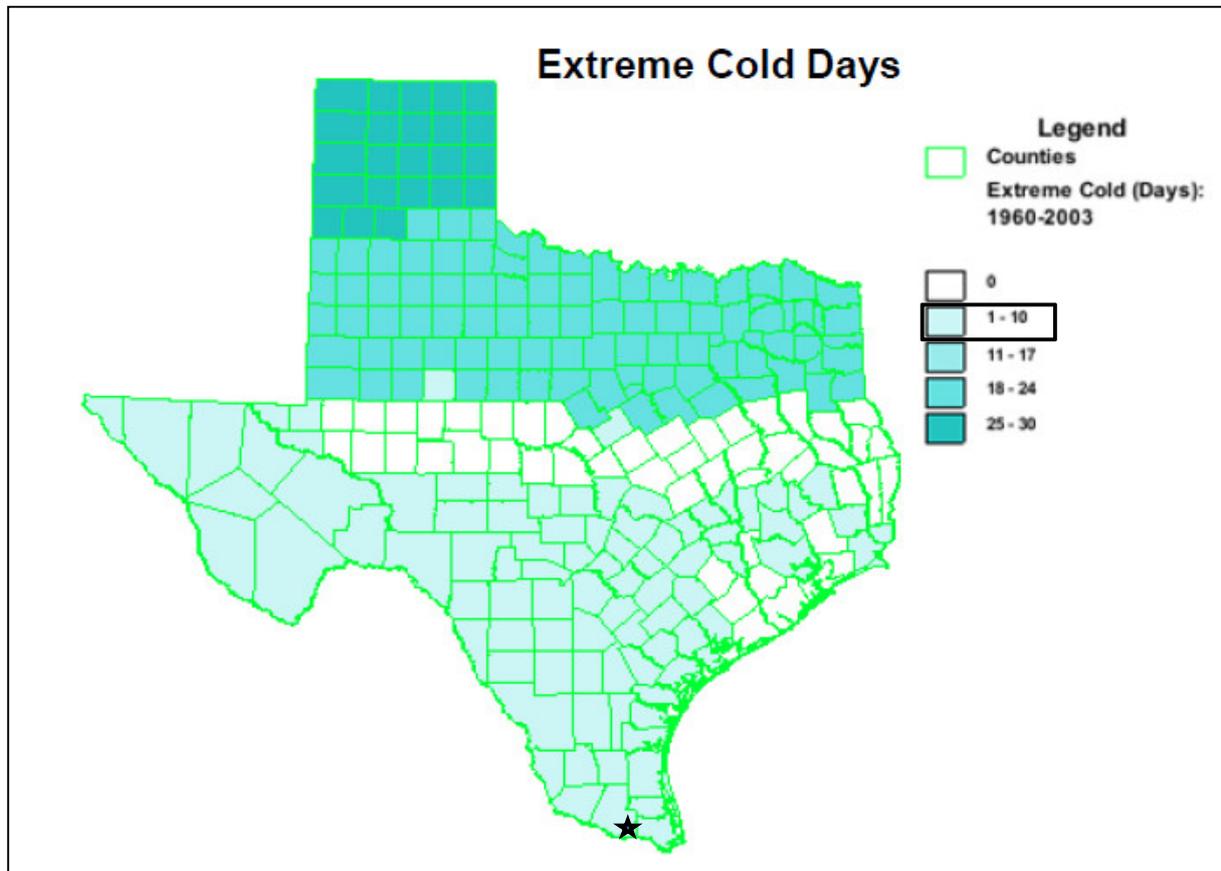


Table 14-1. Types of Winter Storms

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

<sup>1</sup> Source: National Weather Service. City of Weslaco indicated by star.

## SECTION 14: WINTER STORM

TYPE OF WINTER STORM	DESCRIPTION
Blizzard Warning	Sustained wind speeds of at least 35 mph are accompanied by considerable falling or blowing snow. This alert is the most perilous winter storm with visibility dangerously restricted.
Frost/Freeze Warning	Below freezing temperatures are expected and may cause significant damage to plants, crops, and fruit trees.
Wind Chill	A strong wind combined with a temperature slightly below freezing can have the same chilling effect as a temperature nearly 50 degrees lower in a calm atmosphere. The combined cooling power of the wind and temperature on exposed flesh is called the wind-chill factor.

### LOCATION

Winter storm events are not confined to specific geographic boundaries. Therefore, all existing and future buildings, facilities, and populations in the City of Weslaco planning area are considered to be exposed to a winter storm hazard and could potentially be impacted.

### EXTENT

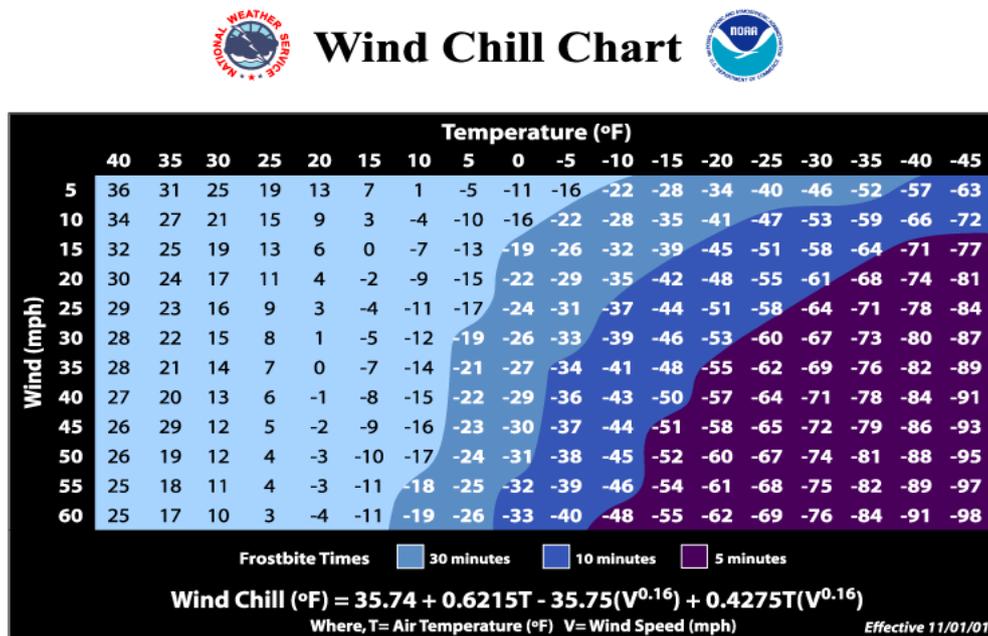
The extent or magnitude of a severe winter storm is measured in intensity based on the temperature and level of accumulations as shown in Table 14-2. Table 14-2 should be read in conjunction with the wind-chill factor described in Figure 14-2 to determine the intensity of a winter storm. The chart is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

**Table 14-2. Magnitude of Severe Winter Storms**

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

## SECTION 14: WINTER STORM

Figure 14-2. Wind Chill Chart



Wind chill temperature is a measure of how cold the wind makes real air temperature feel to the human body. Since wind can dramatically accelerate heat loss from the body, a blustery 30°F day would feel just as cold as a calm day with 0°F temperatures. The City of Weslaco planning area has never experienced a blizzard, but based on 32 previous occurrences recorded from 1996 through November 2019, it has been subject to winter storm watches, warnings, freezing rain, sleet, and wind chill.

The average number of cold days is similar for the entire planning area. Therefore, the intensity or extent of a winter storm event to be mitigated for the area ranges from mild to significant according to the definitions at Table 14-2. The City of Weslaco planning area can expect anywhere between 0.1 to 4.0 inches of ice and snow during a winter storm event and temperatures between 25 and 50 degrees with winds ranging from 0 to 20 mph. This is the worst that can be anticipated to mitigate against in the future for all participating jurisdictions.

### HISTORICAL OCCURRENCES

Table 14-3 shows historical occurrences for Hidalgo County, including the City of Weslaco planning area, from 1996 through November 2019 provided by the NCEI database. Winter storm events are reported on a county-wide level. There have been 32 recorded winter storm events in Hidalgo County, including the City of Weslaco planning area. Historical winter storm information, as provided by the NCEI, identifies winter storm activity across a multi-county forecast area for each event. The appropriate percentage of the total property and crop damage reported for the entire forecast area has been allocated to each county impacted by the event. Historical winter storm data for the county and all participating jurisdictions are provided on a County-wide basis per the NCEI database. Table 14-3 shows historical incident information for the planning area.

## SECTION 14: WINTER STORM

**Table 14-3. Historical Winter Storm Events, 1996-2019<sup>2</sup>**

JURISDICTION	DATE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Hidalgo County	2/3/2011	0	0	\$0	\$5,828,299
Hidalgo County	1/16/2018	0	0	\$52,038	\$0
<b>TOTALS</b>		<b>0</b>	<b>0</b>	<b>\$5,880,337</b>	

### SIGNIFICANT EVENTS

#### January 16, 2018

Glaze ice accreted to 1/8 to 1/16 inch on trees and grasses beginning during the late afternoon of January 16th and continuing through just prior to midnight before precipitation tapered off over the eastern half of Hidalgo County. Conversational light snow during the mid to late afternoon near McAllen ended, with freezing drizzle/light freezing rain developing soon after including parts of the McAllen/Edinburg metro area. Temperatures, which fell to the upper 20s in a pocket from Donna through Mercedes and north toward Elsa/Edcouch and the Willacy County line, allowed untreated elevated road surfaces particularly on IH-2 to quickly glaze over. There were unknown injuries from the pile-up, as well as other accidents along IH-69C between Pharr and Edinburg. Power outages were reported for more than twenty-two thousand customers.

### PROBABILITY OF FUTURE EVENTS

According to historical records, the planning area experiences approximately one winter storm event each year. Hence, the probability of a future winter storm event affecting the City of Weslaco planning area is highly likely, with a winter storm likely to occur within the next year.

### VULNERABILITY AND IMPACT

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

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

All populations, buildings, critical facilities, and infrastructure in the entire City of Weslaco planning area are vulnerable to severe winter events.

The following critical facilities would be vulnerable to Winter Storm events in the City of Weslaco:

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<sup>2</sup> Values are in 2020 dollars. Only historical events with injuries, fatalities, or damages have been listed.

## SECTION 14: WINTER STORM

**Table 14-4. Critical Facilities by Jurisdiction**

JURISDICTION	CRITICAL FACILITIES
City of Weslaco	1 Airport, 1 Police Station, 1 Government Facility, 4 Fire Stations, 5 Medical Facilities, 21 Schools, 1 College, 1 Public Works Department, 3 Water/Wastewater Treatment Facilities

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

Population over 65 in the entire City of Weslaco planning area is estimated at 14.7% of the total population or an estimated total of 5,790<sup>3</sup> potentially vulnerable residents in the planning area based on age. An estimated 26.1% of the planning area population live below the poverty level (Table 14-5).

**Table 14-5. Population at Greater Risk by Jurisdiction**

JURISDICTION	POPULATION 65 AND OLDER	POPULATION BELOW POVERTY LEVEL
City of Weslaco	5,790	10,289

Historic loss, in 2020 dollars, is estimated at \$54,687 in damages over the 24-year recording period giving an approximate loss of \$2,279 in damages annually (Table 14-6). The potential severity of impact for the City of Weslaco planning area are “Limited” meaning injuries are treatable with first aid, shutdown of facilities and services for 24 hours or less, and less than 10% of property destroyed or with major damage.

**Table 14-6. Potential Annualized Losses for the City of Weslaco**

JURISDICTION	PROPERTY & CROP LOSS <sup>4</sup>	ANNUAL LOSS ESTIMATES
City of Weslaco	\$54,687	\$2,279

### ASSESSMENT OF IMPACTS

The greatest risk from a winter storm hazard is to public health and safety. The impact of climate change could produce longer, more intense winter storm events, exacerbating the current winter storm impacts. Worsening winter storm conditions can be frequently associated with a variety of impacts, including:

<sup>3</sup> US Census Bureau 2018 data for City of Weslaco.

<sup>4</sup> Calculated as a percentage (0.93) of the county.

## SECTION 14: WINTER STORM

- Vulnerable populations, particularly the elderly and children under 5, can face serious or life-threatening health problems from exposure to extreme cold including hypothermia and frostbite.
- Loss of electric power or other heat source can result in increased potential for fire injuries or hazardous gas inhalation because residents burn candles for light or use fires or generators to stay warm.
- Response personnel, including utility workers, public works personnel, debris removal staff, tow truck operators, and other first responders, are subject to injury or illness resulting from exposure to extreme cold temperatures.
- Response personnel would be required to travel in potentially hazardous conditions, elevating the life safety risk due to accidents and potential contact with downed power lines.
- Operations or service delivery may experience impacts from electricity blackouts due to winter storms.
- Power outages are possible throughout the planning area due to downed trees and power lines and/or rolling blackouts.
- Critical facilities without emergency backup power may not be operational during power outages.
- Emergency response and service operations may be impacted by limitations on access and mobility if roadways are closed, unsafe, or obstructed.
- Hazardous road conditions will likely lead to increases in automobile accidents, further straining emergency response capabilities.
- Depending on the severity and scale of damage caused by ice and snow events, damage to power transmission and distribution infrastructure can require days or weeks to repair.
- A winter storm event could lead to tree, shrub, and plant damage or death.
- Severe cold and ice could significantly damage agricultural crops.
- Schools may be forced to shut early due to treacherous driving conditions.
- Exposed water pipes may be damaged by severe or late season winter storms at both residential and commercial structures, causing significant damages.

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

# SECTION 15: EXPANSIVE SOILS

Hazard Description ..... 1  
Location ..... 1  
Extent ..... 4  
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## HAZARD DESCRIPTION

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

Expansive soils contain minerals such as smectite clays that are capable of absorbing water. When these clays absorb water they increase in volume and expand. The change in soil volume and resulting expansion can exert enough force on a building or other structure to cause damage.

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

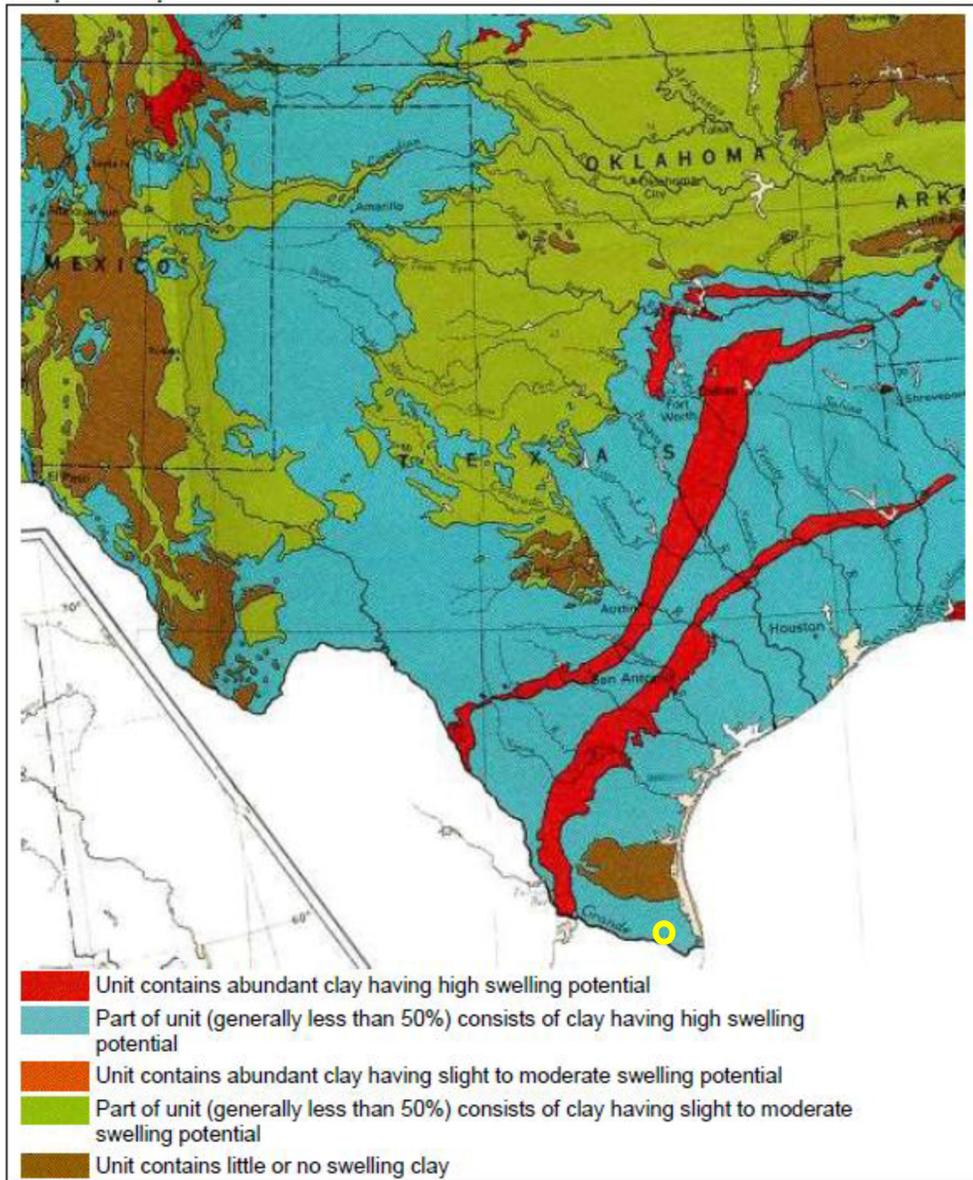


## LOCATION

The City of Weslaco planning area may be affected by expansive soils predominant throughout the state. Figure 15-1 depicts expansive soils across the State of Texas and the City of Weslaco planning area is identified within the yellow circle. These areas receive the significant moisture and are also vulnerable to droughts, which can cause the soils to expand and contract. Figure 15-2 depicts the types of land resources in the State of Texas due to their soil types.

# SECTION 15: EXPANSIVE SOILS

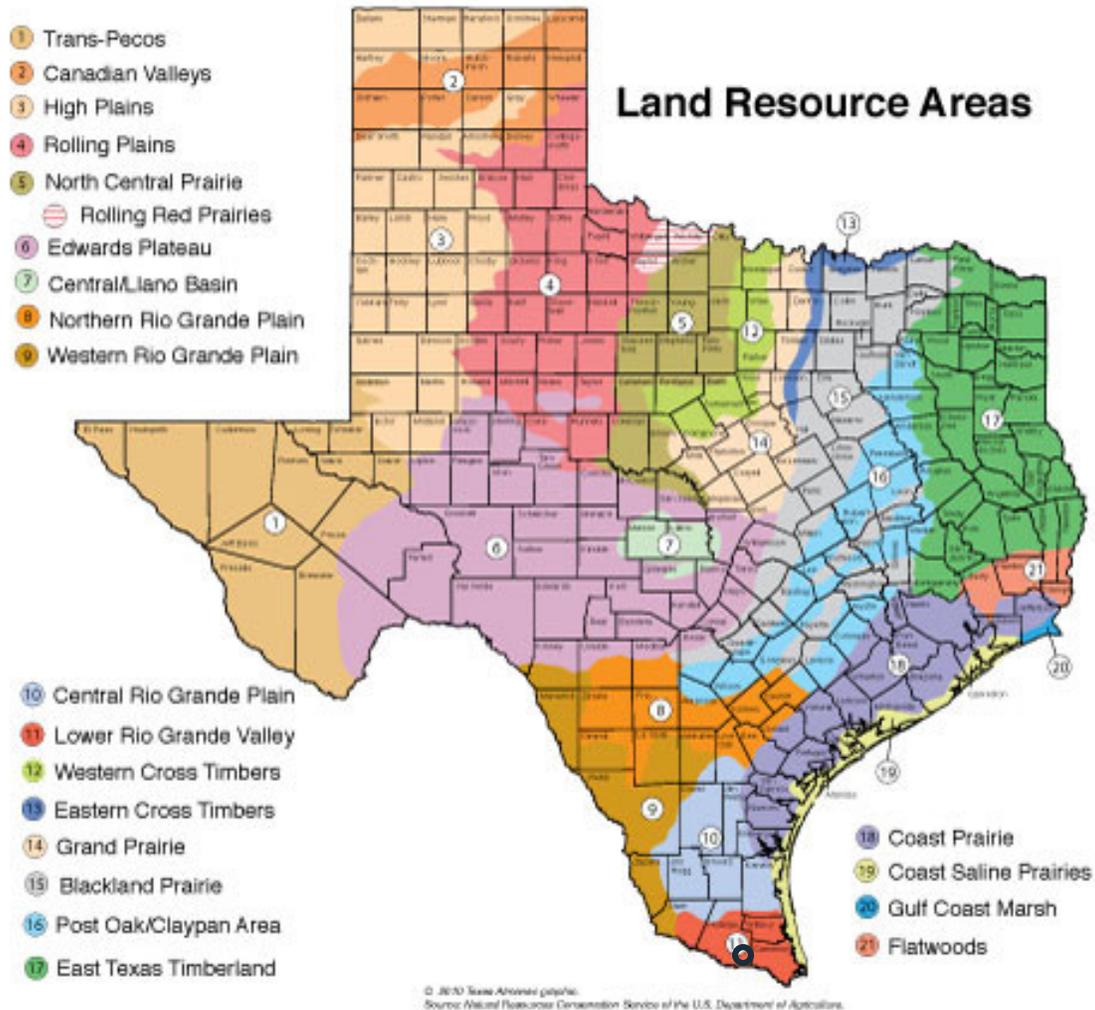
Figure 15-1. Texas Geological Survey<sup>1</sup>



<sup>1</sup> Source: United States Geological Survey, <http://www.usgs.gov>

## SECTION 15: EXPANSIVE SOILS

Figure 15-2. Texas Geological Survey



The City of Weslaco planning area is located within the Lower Rio Grande Valley as identified within the black circle in Figure 15-2. The entire planning area is located in an area affected by moderate expansive soils.

*Lower Rio Grande Valley:* The valley is located in the southernmost tip of South Texas. It makes up about 2,500 square miles and lies along the northern bank of the Rio Grande, which separates Mexico from the United States. The Rio Grande Valley of South Texas is not a valley, but a delta or floodplain containing many oxbow lakes or resacas formed from pinched-off meanders in earlier courses of the Rio Grande. The soils in this region are dominantly Alfisols, Aridisols, Inceptisols, Mollisols, and Vertisols. Ustolls and Usterts are especially prominent in the southeastern part. The soils in this region dominantly have a hyperthermic soil temperature regime, an ustic soil moisture regime, and mixed mineralogy.

## SECTION 15: EXPANSIVE SOILS

The native vegetation consists mainly of shrubs interspersed with grasses and scattered trees. Grazing is the dominant land use in most of the region, but wheat, grain sorghum, and other small grain crops are grown in areas where the soils, topography, and moisture supply are favorable. Irrigated cotton is an important crop in the southeastern part of the region. Citrus fruits and winter vegetables are grown in the lower Rio Grande Valley.

### EXTENT

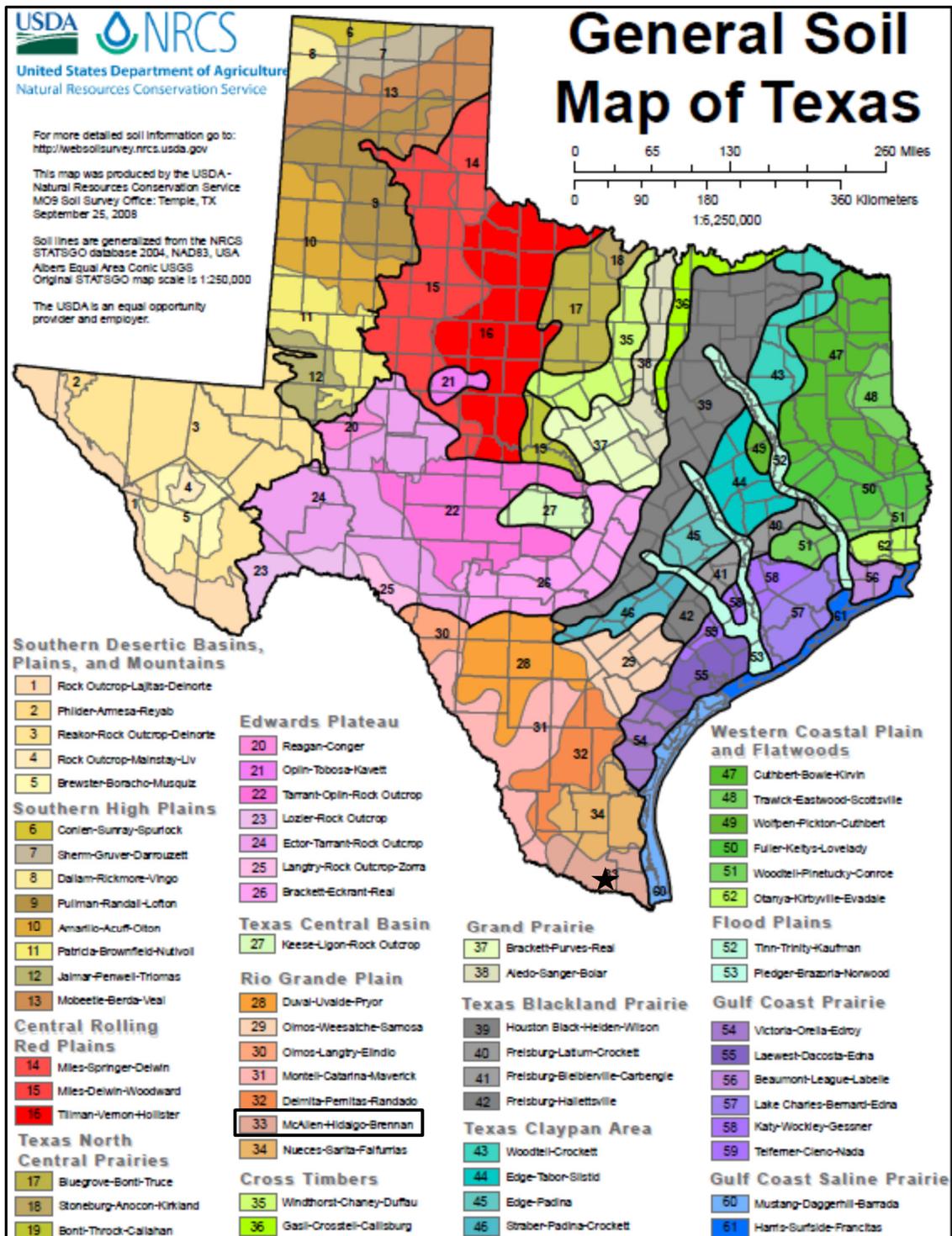
The extent to which soil expansion is present in an area can be determined using the predominant soil composition and associated permeability. The soil survey was developed by the USDA Soils Conservation Service and contains information that can be applied in determining the suitability of soils in the planning area when selecting sites for roads, structures, and infrastructure.<sup>2</sup> Figure 15-3 shows the predominant soil types throughout the state of Texas and the planning area.

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<sup>2</sup> Source: United States Department of Agriculture Soil Conservation Service

# SECTION 15: EXPANSIVE SOILS

Figure 15-3. USDA General Soil Map of Texas



The cream area marked as #33 indicates predominant soils including McAllen, Hidalgo, and Brennan soils. The Hidalgo County Soil Survey provides a description of these predominant soils along with the plasticity index of each. Higher plasticity index soils exhibit greater sensitivity to drought conditions. The shrinking and swelling causes significant problems with foundations,

## SECTION 15: EXPANSIVE SOILS

roadways, sidewalks and other structures and infrastructure. Table 15-1 includes the plasticity index value ranges and soil properties while Table 15-2 includes additional descriptions of the soil types predominant throughout the planning area with the assigned plasticity index per soil type by area as identified in Figure 15-3. The predominant soil types for each area can vary greatly from one plat to the next.

The Plasticity Index is provided for each type of soil within the planning area. The plasticity index ranges are provided on a county-wide basis for each predominant soil type. The plasticity index for each soil type as well as the descriptions provided in the tables below represent a summary of the data provided in the USDA Soil Survey of Hidalgo County.<sup>3</sup>

**Table 15-1. Value and Plasticity Index of Soils**

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

**Table 15-2. City of Weslaco/Hidalgo County Soil Description by Area and Plasticity Index of Soils**

AREA	SOILS	DESCRIPTION	PLASTICITY INDEX	POTENTIAL EXPANSION/EXTENT LEVEL
39	McAllen-Hidalgo-Brennan Soils	McAllen series soil consists of deep, well drained, moderately permeable soils that formed in calcareous loamy sediments. These soils are on nearly level to gently sloping uplands. This predominant soil type is typically suitable for rangeland and crops.  Hidalgo series soil consists of deep, well drained, moderately permeable soils that formed in calcareous loamy sediments. These soils are on nearly level to gently sloping uplands. This predominant soil type is	8-22; 11-23	Low, Medium High

<sup>3</sup> USDA Soil Survey of Hidalgo County, 1973, website: [https://www.nrcs.usda.gov/Internet/FSE\\_MANUSCRIPTS/new\\_mexico/hidalgoNM1973/hidalgoNM1973.pdf](https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/new_mexico/hidalgoNM1973/hidalgoNM1973.pdf)

## SECTION 15: EXPANSIVE SOILS

AREA	SOILS	DESCRIPTION	PLASTICITY INDEX	POTENTIAL EXPANSION/EXTENT LEVEL
		<p>typically suitable for irrigated crops.</p> <p>Brennan series soil consists of very deep, well drained soils. These nearly level to gently undulating soils formed in loamy eolian sands and calcareous loamy alluvium on vegetated sand sheet plains. This predominant soil type is typically suitable for livestock grazing.</p>		

High plasticity soils are prone to shrink and swell as soil moisture changes, which can degrade pavement, causing longitudinal cracking and edge drop-off. This effect can damage foundations of buildings and homes. The City of Weslaco planning area is subject to a range of plasticity Index levels including low, high, and high, as indicated by the soils in Figure 15-3, and Tables 15-1 through 15-2 above. Plasticity of soils are highly subject to location and soil moisture content in any given time frame and location. Due to the broad plasticity index range throughout the City of Weslaco planning area, the worst the entire planning area may anticipate is high swelling potential.

### HISTORICAL OCCURRENCES

Expansive soils is a condition that is native to Texas soil characteristics, and cannot be documented as a time-specific event, except when it leads to structural and infrastructure damage. Extreme conditions can damage roads, structures, and infrastructure, including projects still under construction. Damages from expansive soils are typically associated with droughts. There is currently no historical data available for historic expansive soil damages in the City of Weslaco. The limited data for historical expansive soil incidents is noted as a data deficiency for this planning cycle. An action has been created to enhance data collection for expansive soil incidents in future plan updates.

### PROBABILITY OF FUTURE EVENTS

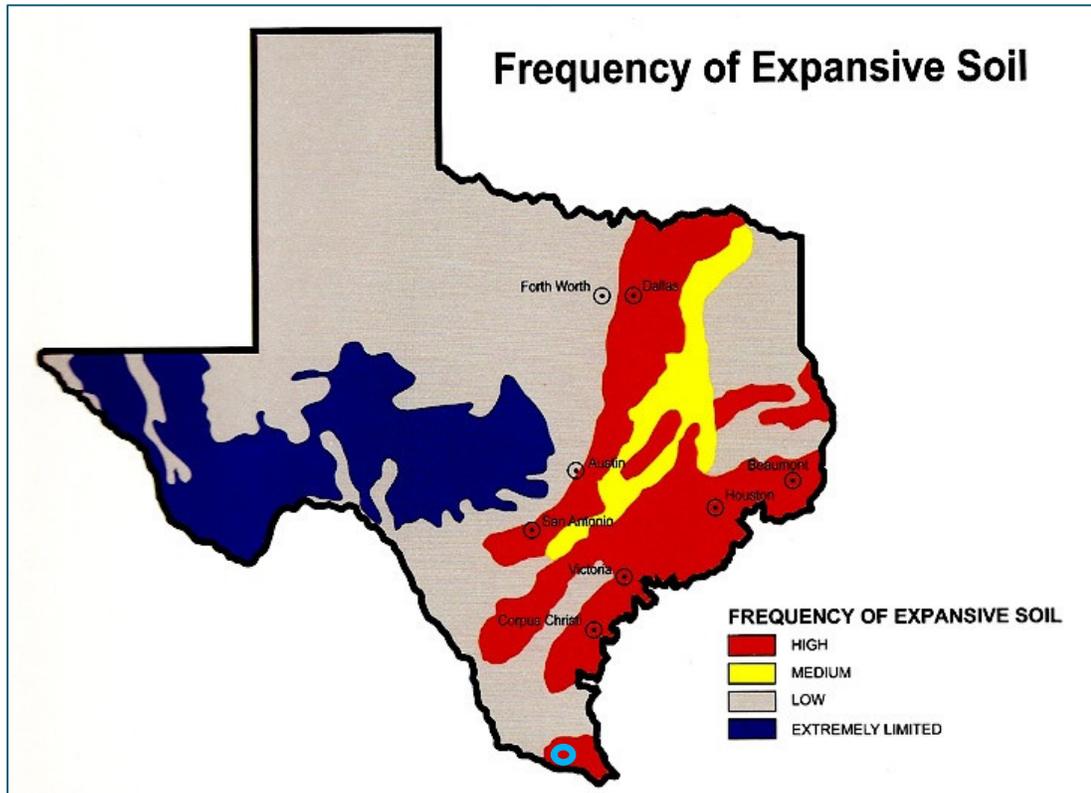
Since no other records of specific incidences of loss associated with expansive soils were found, and no specific occurrences of expansive soils were identified within the planning area, the probability of future events cannot be determined at this time. However, according to public opinion, the probability of future events of loss due to expansive soils within the planning area, is highly likely, especially when periods of drought increase throughout the planning area.

Figure 15-4 displays the frequency of expansive soil occurrences for the entire state. The City of Weslaco planning area is shown in the green circle and is subject to a “High” frequency of expansive soils. Section 11 of the plan provides in-depth analysis of drought in the planning area. Damages from expansive soils are typically associated with droughts. Historical drought records

## SECTION 15: EXPANSIVE SOILS

support a highly likely probability of future events. Assuming a correlation between drought and expansive soils, the planning area can anticipate a similar frequency for expansive soil events.

**Figure 15-4. Frequency of Expansive Soil**



### VULNERABILITY AND IMPACT

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



Cracked foundations and floors, jammed windows and doors, and ruptured pipelines are typical types of damage resulting from swelling soils. Damage to the upper floors of larger buildings can occur when motion in the structure is significant. While all infrastructure within in the City of

## SECTION 15: EXPANSIVE SOILS

Weslaco planning area, slab on grade structures are more likely to suffer damages from expansive soils. In addition, older structures built to less stringent building codes may also be more susceptible to damages than new construction.

While the number of slab on grade structures is not available, the U.S. Census data indicates approximately 5,597 of the residential structures in the planning area were built before 1980 (Table 15-3) and may be more susceptible to damages.

**Table 15-3. Structures at Greater Risk**

JURISDICTION	SFR STRUCTURES BUILT BEFORE 1980
City of Weslaco	5,428

The following critical facilities would be vulnerable to expansive soils in the City of Weslaco planning area.

**Table 15-4. Critical Facilities in the City of Weslaco**

Jurisdiction	Critical Facilities
City of Weslaco	1 Airport, 1 Police Station, 1 Government Facility, 4 Fire Stations, 5 Medical Facilities, 21 Schools, 1 College, 1 Public Works Department, 3 Water/Wastewater Treatment Facilities

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

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

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

# SECTION 16: MITIGATION STRATEGY

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Mitigation Goals ..... 1

    Goal 1 ..... 1

    Goal 2 ..... 1

    Goal 3 ..... 2

    Goal 4 ..... 2

    Goal 5 ..... 2

    Goal 6 ..... 3

## MITIGATION GOALS

Based on the results of the risk and capability assessments, the Planning Team developed and prioritized the mitigation strategy. At the Mitigation Workshop webinar in May 2020, Planning Team members refined the Plan’s mitigation strategy. The following goals and objectives were identified.

### GOAL 1

Protect public health and safety.

#### OBJECTIVE 1.1

Advise the public about health and safety precautions to guard against injury and loss of life from hazards.

#### OBJECTIVE 1.2

Maximize utilization of the latest technology to provide adequate warning, communication, and mitigation of hazard events.

#### OBJECTIVE 1.3

Reduce the danger to, and enhance protection of, high risk areas during hazard events.

#### OBJECTIVE 1.4

Protect critical facilities and services.

### GOAL 2

Build and support local capacity and commitment to continuously become less vulnerable to hazards.

#### OBJECTIVE 2.1

Build and support local partnerships to continuously become less vulnerable to hazards.

#### OBJECTIVE 2.2

Build a cadre of committed volunteers to safeguard the community before, during, and after a disaster.

#### OBJECTIVE 2.3

Build hazard mitigation concerns into county planning and budgeting processes.

## SECTION 16: MITIGATION STRATEGY



### GOAL 3

Increase public understanding, support, and demand for hazard mitigation.

#### OBJECTIVE 3.1

Heighten public awareness regarding the full range of natural hazards the public may face.

#### OBJECTIVE 3.2

Educate the public on actions they can take to prevent or reduce the loss of life and/or property from all hazards and increase individual efforts to respond to potential hazards.

#### OBJECTIVE 3.3

Publicize and encourage the adoption of appropriate hazard mitigation measures.

### GOAL 4

Protect new and existing properties.

#### OBJECTIVE 4.1

Reduce repetitive losses to the National Flood Insurance Program (NFIP).

#### OBJECTIVE 4.2

Use the most cost-effective approach to protect existing buildings and public infrastructure from hazards.

#### OBJECTIVE 4.3

Enact and enforce regulatory measures to ensure that future development will not put people in harm's way or increase threats to existing properties.

### GOAL 5

Maximize the resources for investment in hazard mitigation.

#### OBJECTIVE 5.1

Maximize the use of outside sources of funding.

#### OBJECTIVE 5.2

Maximize participation of property owners in protecting their properties.

#### OBJECTIVE 5.3

Maximize insurance coverage to provide financial protection against hazard events.

## SECTION 16: MITIGATION STRATEGY

### *OBJECTIVE 5.4*

Prioritize mitigation projects, based on cost-effectiveness and sites facing the greatest threat to life, health, and property.

### *GOAL 6*

Promote growth in a sustainable manner.

### *OBJECTIVE 6.1*

Incorporate hazard mitigation activities into long-range planning and development activities.

### *OBJECTIVE 6.2*

Promote beneficial uses of hazardous areas while expanding open space and recreational opportunities.

### *OBJECTIVE 6.3*

Utilize regulatory approaches to prevent creation of future hazards to life and property.

# SECTION 17: Mitigation Actions

Summary ..... 1  
City of Weslaco ..... 3

## SUMMARY

As discussed in Section 2, at the mitigation workshop the planning team and stakeholders met to develop mitigation actions for each of the natural hazards included in the Plan. Each of the actions in this section were prioritized based on the Federal Emergency Management Agency’s (FEMA) Social, Technical, Administrative, Political, Legal, Economic, and Environmental [STAPLE(E)] criteria necessary for the implementation of each action. As a result of this exercise, an overall priority was assigned to each mitigation action.

As part of the economic evaluation of the STAPLE(E) analysis, jurisdictions analyzed each action in terms of the overall costs, measuring whether the potential benefit to be gained from the action outweighed costs associated with it. As a result of this exercise, priority was assigned to each mitigation action by marking them as High (H), Moderate (M), or Low (L). An action that is ranked as “High” indicates that the action will be implemented as soon as funding is received. A “Moderate” action is one that may not be implemented right away depending on the cost and number of citizens served by the action. Actions ranked as “Low” indicate that they will not be implemented without first seeking grant funding and after “High” and “Moderate” actions have been completed.

All mitigation actions created by Planning Team members are presented in this section in the form of Mitigation Action Worksheets. More than one hazard is sometimes listed for an action, if appropriate. Actions presented in this section represent a comprehensive range of mitigation actions per current State and FEMA Guidelines, including two actions per hazard and of two different types.

## SECTION 17: MITIGATION ACTIONS

**Table 17-1. City of Weslaco Mitigation Action Matrix**

### MITIGATION ACTION MATRIX

Actions presented in this matrix represent a comprehensive range and minimum number of required mitigation actions per current State and FEMA Guidelines, including two actions per hazard and of two different types.

### CITY OF WESLACO: MITIGATION ACTION MATRIX

HAZARDS	Types of Action:				
	LOCAL PLANS/ REGULATIONS	STRUCTURAL/ INFRASTRUCTURE	NATURAL SYSTEM PROTECTION	EDUCATION & AWARENESS	PREPAREDNESS / RESPONSE/ OTHER
Flood		XXXXXXXXXX		XX	
Hurricane Wind		XXXXX		XX	
Thunderstorm Wind		XXXXX		XX	
Extreme Heat		XXX		XX	
Lightning		XXX		XX	
Tornado		XXXXX		XX	
Drought		X		XX	
Hail		XXX		XX	
Wildfire		XXXX		XX	
Winter Storm	X	XXXXX		XX	
Expansive Soils		X		XX	

## SECTION 17: MITIGATION ACTIONS

### CITY OF WESLACO

<b>City of Weslaco – Action #1</b>	
<b>Proposed Action:</b>	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages.
<b>BACKGROUND INFORMATION</b>	
<b>Jurisdiction/Location:</b>	City Hall, Police / Fire Public Safety building, Public Works, Shelter
<b>Risk Reduction Benefit (Current Cost/ Losses Avoided):</b>	Promote hazard awareness and protect citizens from potential injuries and damages.
<b>Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)</b>	Education and Awareness

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Drought, Extreme Heat, Expansive Soils, Flood, Hail, Hurricane Wind, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
<b>Effect on New/Existing Buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$10,000
<b>Potential Funding Sources:</b>	Local Funds (staff time), State and Federal Grants
<b>Lead Agency/Department Responsible:</b>	City of Weslaco Administration
<b>Implementation Schedule:</b>	Within 12-24 months of plan adoption
<b>Incorporation into Existing Plans:</b>	N/A

<b>COMMENTS</b>

## SECTION 17: MITIGATION ACTIONS

<b>City of Weslaco – Action #2</b>	
<b>Proposed Action:</b>	Acquire and install generators with hard wired quick connections at critical facilities to support operations during hazard events.
<b>BACKGROUND INFORMATION</b>	
<b>Jurisdiction/Location:</b>	City Hall, Police / Fire Public Safety building, Public Works, Shelter
<b>Risk Reduction Benefit (Current Cost/ Losses Avoided):</b>	Provide power for critical facilities during power outages and ensure continuity of critical services.
<b>Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)</b>	Structure and Infrastructure

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Extreme Heat, Flood, Hail, Hurricane Wind, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
<b>Effect on New/Existing Buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$85,000 per site
<b>Potential Funding Sources:</b>	Local Funds, State and Federal Grants
<b>Lead Agency/Department Responsible:</b>	City of Weslaco Administration
<b>Implementation Schedule:</b>	Within 12-24 months of plan adoption
<b>Incorporation into Existing Plans:</b>	Emergency Management Plan

<b>COMMENTS</b>

## SECTION 17: MITIGATION ACTIONS

<b>City of Weslaco – Action #3</b>	
<b>Proposed Action:</b>	Implement education and awareness program utilizing media, social media, bulletins, flyers, etc. to educate citizens with underlying medical conditions of hazards that can threaten the area and mitigation measures to reduce injuries, fatalities, and property damages and continued treatment of Dialysis patients.
<b>BACKGROUND INFORMATION</b>	
<b>Jurisdiction/Location:</b>	1005 South Airport, Weslaco, TX 910 South Utah, Weslaco, TX 1614 East Commercial Drive, Weslaco, TX 1010 Rone Drive, Weslaco, TX
<b>Risk Reduction Benefit (Current Cost/ Losses Avoided):</b>	Promote hazard awareness and protect citizens from potential injuries and damages.
<b>Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)</b>	Education and Awareness

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Drought, Extreme Heat, Expansive Soils, Flood, Hail, Hurricane Wind, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
<b>Effect on New/Existing Buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$10,000 per dialysis center
<b>Potential Funding Sources:</b>	Local Funds (staff time), State and Federal Grants
<b>Lead Agency/Department Responsible:</b>	City of Weslaco administration
<b>Implementation Schedule:</b>	Within 12-24 months of plan adoption
<b>Incorporation into Existing Plans:</b>	Emergency Operations Plan

<b>COMMENTS</b>
As a vulnerable population, the need for education and awareness is critical to the continued treatment of life sustaining hemodialysis. Centers in Weslaco care and treat over 600 patients under life sustaining treatment.

## SECTION 17: MITIGATION ACTIONS

<b>City of Weslaco – Action #4</b>	
<b>Proposed Action:</b>	Acquire and install generators with hard wired quick connections at critical facilities to support operations during hazard events.
<b>BACKGROUND INFORMATION</b>	
<b>Jurisdiction/Location:</b>	1005 South Airport, Weslaco, TX 910 South Utah, Weslaco, TX 1614 East Commercial Drive, Weslaco, TX 1010 Rone Drive, Weslaco, TX
<b>Risk Reduction Benefit (Current Cost/ Losses Avoided):</b>	Provide power for critical facilities during power outages and ensure continuity of critical services.
<b>Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)</b>	Structure and Infrastructure

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Extreme Heat, Flood, Hail, Hurricane Wind, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
<b>Effect on New/Existing Buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$85,000 per site
<b>Potential Funding Sources:</b>	Local Funds, State and Federal Grants
<b>Lead Agency/Department Responsible:</b>	City of Weslaco Administration
<b>Implementation Schedule:</b>	Within 12-24 months of plan adoption
<b>Incorporation into Existing Plans:</b>	Emergency Management Plan

<b>COMMENTS</b>

## SECTION 17: MITIGATION ACTIONS

<b>City of Weslaco – Action #5</b>	
<b>Proposed Action:</b>	City-Wide Culvert Crossings upgrades.
<b>BACKGROUND INFORMATION</b>	
<b>Jurisdiction/Location:</b>	10 <sup>th</sup> St. & Border Ave.
<b>Risk Reduction Benefit (Current Cost/ Losses Avoided):</b>	City of Weslaco proposes to upgrade crossings to increase conveyance capacity at critical crossings leading to ultimate outfall at flood levees and reducing future flood losses.
<b>Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)</b>	Structure and Infrastructure

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on New/Existing Buildings:</b>	Reduce risk to existing structures and infrastructure
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$100,000
<b>Potential Funding Sources:</b>	TWDB, FEMA, State and Federal Grants
<b>Lead Agency/Department Responsible:</b>	City of Weslaco/Engineering Dept./Public Works
<b>Implementation Schedule:</b>	Within 36 months of plan adoption
<b>Incorporation into Existing Plans:</b>	Drainage Plan

<b>COMMENTS</b>

## SECTION 17: MITIGATION ACTIONS

<b>City of Weslaco – Action #6</b>	
<b>Proposed Action:</b>	City-Wide Culvert Crossings upgrades.
<b>BACKGROUND INFORMATION</b>	
<b>Jurisdiction/Location:</b>	Airport Dr. by Pablo G. Peña Park culvert crossing on West side of Airport Dr.
<b>Risk Reduction Benefit (Current Cost/ Losses Avoided):</b>	City of Weslaco proposes to upgrade crossings to increase conveyance capacity at critical crossings leading to ultimate outfall at flood levees and reduce future flood damages.
<b>Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)</b>	Structure and Infrastructure

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on New/Existing Buildings:</b>	Reduce risk to existing structures and infrastructure
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$100,000
<b>Potential Funding Sources:</b>	TWDB, FEMA
<b>Lead Agency/Department Responsible:</b>	City of Weslaco/Engineering Dept./Public Works
<b>Implementation Schedule:</b>	Within 36 months of plan adoption
<b>Incorporation into Existing Plans:</b>	Drainage Plan

<b>COMMENTS</b>

## SECTION 17: MITIGATION ACTIONS

<b>City of Weslaco – Action #7</b>	
<b>Proposed Action:</b>	Audrey Drainage Improvement Project  Upgrade culvert pipe from existing drainage ditch across HCCID#9 Irrigation channel to ditch 37A and remove existing pipe and excavate ditch channel.
<b>BACKGROUND INFORMATION</b>	
<b>Jurisdiction/Location:</b>	Project is located east of Texas Blvd and north of Mile 5 North Rd east of Stone Ridge Subdivision
<b>Risk Reduction Benefit (Current Cost/ Losses Avoided):</b>	This project replaces pipe culvert across irrigation channel and restores optimal conveyance stormwater capacity. The project also removes 120 LF of RCP and replaces with open channel ditch. The project removes 50 houses from the 10-year floodplain.  BCA: 30
<b>Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)</b>	Structure and Infrastructure

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on New/Existing Buildings:</b>	Removes 50 existing houses from the 10-year floodplain
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$150,000
<b>Potential Funding Sources:</b>	TWDB, FEMA
<b>Lead Agency/Department Responsible:</b>	City of Weslaco / Engineering Dept.
<b>Implementation Schedule:</b>	Within 36 months of plan adoption
<b>Incorporation into Existing Plans:</b>	Drainage Plan

<b>COMMENTS</b>

## SECTION 17: MITIGATION ACTIONS

<b>City of Weslaco – Action #8</b>	
<b>Proposed Action:</b>	City-Wide Culvert Crossings upgrades.
<b>BACKGROUND INFORMATION</b>	
<b>Jurisdiction/Location:</b>	Midpoint Subdivision – Culvert crossing entrance to Midpoint Subdivision
<b>Risk Reduction Benefit (Current Cost/ Losses Avoided):</b>	City of Weslaco proposes to upgrade crossings to increase conveyance capacity at critical crossings leading to ultimate outfall at flood levees and reduce future flood losses.  BCA: Pending
<b>Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)</b>	Structure and Infrastructure

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on New/Existing Buildings:</b>	Reduce risk to existing structures and infrastructure
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$100,000
<b>Potential Funding Sources:</b>	TWDB, FEMA, State and Federal Grants
<b>Lead Agency/Department Responsible:</b>	City of Weslaco/Engineering Dept./Public Works
<b>Implementation Schedule:</b>	Within 36 months of plan adoption
<b>Incorporation into Existing Plans:</b>	Drainage Plan

<b>COMMENTS</b>
Headwall/Pipe is too high and level of ditch is too low.

## SECTION 17: MITIGATION ACTIONS

<b>City of Weslaco – Action #9</b>	
<b>Proposed Action:</b>	City-Wide Culvert Crossings upgrades.
<b>BACKGROUND INFORMATION</b>	
<b>Jurisdiction/Location:</b>	Paisano Lane – Ditch on south of Paisano Lane
<b>Risk Reduction Benefit (Current Cost/ Losses Avoided):</b>	City of Weslaco proposes to upgrade crossings to increase conveyance capacity at critical crossings leading to ultimate outfall at flood levees and reduce future flood losses.
<b>Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)</b>	Structure and Infrastructure

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on New/Existing Buildings:</b>	Reduce risk to existing structures and infrastructure
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$100,000
<b>Potential Funding Sources:</b>	TWDB, FEMA
<b>Lead Agency/Department Responsible:</b>	City of Weslaco/Engineering Dept./Public Works
<b>Implementation Schedule:</b>	Within 36 months of plan adoption
<b>Incorporation into Existing Plans:</b>	Drainage Plan

<b>COMMENTS</b>

## SECTION 17: MITIGATION ACTIONS

<b>City of Weslaco – Action #10</b>	
<b>Proposed Action:</b>	South Border Crossing Improvement Project Upgrade existing culvert crossing on Border Street north of Mile 5 North Rd.
<b>BACKGROUND INFORMATION</b>	
<b>Jurisdiction/Location:</b>	Project is located South Border Street and north of Mile 5 North Rd near the Recycling Center
<b>Risk Reduction Benefit (Current Cost/ Losses Avoided):</b>	This project upgrades the pipe culvert across Border Street and will increase stormwater conveyance capacity. The project removes 58 houses from the 10-year floodplain.  BCA: 17.4
<b>Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)</b>	Structure and Infrastructure

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on New/Existing Buildings:</b>	Removes 58 existing houses from the 10-year floodplains
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$300,000
<b>Potential Funding Sources:</b>	TWDB, FEMA
<b>Lead Agency/Department Responsible:</b>	City of Weslaco / Engineering Dept.
<b>Implementation Schedule:</b>	Within 36 months of plan adoption
<b>Incorporation into Existing Plans:</b>	Drainage Plan

<b>COMMENTS</b>

## SECTION 17: MITIGATION ACTIONS

<b>City of Weslaco – Action #11</b>	
<b>Proposed Action:</b>	Southland Heights Drainage Project  Upgrade existing drainage pipe (2700 LF) from Southland Heights Subdivision to outfall ditch at Harlon Block Park.
<b>BACKGROUND INFORMATION</b>	
<b>Jurisdiction/Location:</b>	Project is located east of Border Street and north of 18 <sup>th</sup> St near the Harlon Block Park
<b>Risk Reduction Benefit (Current Cost/ Losses Avoided):</b>	This project installs larger drainage pipe that will increase stormwater conveyance capacity and removes 31 houses from the 10-year floodplain.  BCA: 5.6
<b>Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)</b>	Structure and Infrastructure

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on New/Existing Buildings:</b>	Removes 31 existing houses from the 10-year floodplains
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$500,000
<b>Potential Funding Sources:</b>	TWDB, FEMA
<b>Lead Agency/Department Responsible:</b>	City of Weslaco / Engineering Dept.
<b>Implementation Schedule:</b>	Within 36 months of plan adoption
<b>Incorporation into Existing Plans:</b>	Drainage Plan

<b>COMMENTS</b>

## SECTION 17: MITIGATION ACTIONS

<b>City of Weslaco – Action #12</b>	
<b>Proposed Action:</b>	City-Wide Culvert Crossings upgrades.
<b>BACKGROUND INFORMATION</b>	
<b>Jurisdiction/Location:</b>	Texas Blvd. South of Mile 10 (West Side)
<b>Risk Reduction Benefit (Current Cost/ Losses Avoided):</b>	City of Weslaco proposes to upgrade crossings to increase conveyance capacity at critical crossings leading to ultimate outfall at flood levees.  BCA: Pending
<b>Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)</b>	Structure and Infrastructure

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Flood
<b>Effect on New/Existing Buildings:</b>	Reduce risk to existing structures and infrastructure
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$100,000
<b>Potential Funding Sources:</b>	TWDB, FEMA
<b>Lead Agency/Department Responsible:</b>	City of Weslaco/Engineering Dept./Public Works
<b>Implementation Schedule:</b>	Within 36 months of plan adoption
<b>Incorporation into Existing Plans:</b>	Drainage Plan

<b>COMMENTS</b>
Culvert crossing pipe needs to be upgraded to a bigger pipe.

## SECTION 17: MITIGATION ACTIONS

<b>City of Weslaco – Action #13</b>	
<b>Proposed Action:</b>	Upgrade critical facilities to include drought mitigation measures and expansive soils protection such as greywater reuse systems, drought tolerant landscaping, installation of a sprinkler system with regular watering schedule and installation of French drains where high plasticity soils are indicated.
<b>BACKGROUND INFORMATION</b>	
<b>Jurisdiction/Location:</b>	Community-wide critical facilities
<b>Risk Reduction Benefit (Current Cost/ Losses Avoided):</b>	Reduce damages at critical facilities.
<b>Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)</b>	Structure and Infrastructure

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Drought, Expansive Soils
<b>Effect on New/Existing Buildings:</b>	Reduce risk to existing and future structures
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	\$100,000
<b>Potential Funding Sources:</b>	Local Funds, State and Federal Grants
<b>Lead Agency/Department Responsible:</b>	City of Weslaco Administration
<b>Implementation Schedule:</b>	Within 24 months of plan adoption
<b>Incorporation into Existing Plans:</b>	Capital Improvement Plan

<b>COMMENTS</b>

## SECTION 17: MITIGATION ACTIONS

<b>City of Weslaco – Action #14</b>	
<b>Proposed Action:</b>	Build safe room shelters throughout the jurisdiction so that residents can reach shelter in less than five minutes.
<b>BACKGROUND INFORMATION</b>	
<b>Jurisdiction/Location:</b>	Community-wide
<b>Risk Reduction Benefit (Current Cost/ Losses Avoided):</b>	Reduce risk to citizens by providing shelter in high risk areas during extreme weather events.
<b>Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)</b>	Structure and Infrastructure

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Thunderstorm Wind, Tornado, Hurricane Wind
<b>Effect on New/Existing Buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	Low
<b>Estimated Cost:</b>	\$1,000,000
<b>Potential Funding Sources:</b>	Local Funds, State and Federal Grants
<b>Lead Agency/Department Responsible:</b>	City of Weslaco Administration
<b>Implementation Schedule:</b>	Within 36 months of plan adoption
<b>Incorporation into Existing Plans:</b>	Emergency Management Plan; Capital Improvement Plan

<b>COMMENTS</b>

## SECTION 17: MITIGATION ACTIONS

<b>City of Weslaco – Action #15</b>	
<b>Proposed Action:</b>	Adopt and implement program to insulate outdoor pipes at public buildings.
<b>BACKGROUND INFORMATION</b>	
<b>Jurisdiction/Location:</b>	Community public facilities
<b>Risk Reduction Benefit (Current Cost/ Losses Avoided):</b>	Reduce risk of damages at public buildings resulting from freezing temperatures; Ensure continuity of public services.
<b>Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)</b>	Structure and Infrastructure Local Plans and Regulations

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Winter Storm
<b>Effect on New/Existing Buildings:</b>	Reduce risk to existing structures
<b>Priority (High, Moderate, Low):</b>	Moderate
<b>Estimated Cost:</b>	\$10,000
<b>Potential Funding Sources:</b>	Local Funds, State and Federal Grants
<b>Lead Agency/Department Responsible:</b>	City of Weslaco Administration
<b>Implementation Schedule:</b>	Within 24 months of plan adoption
<b>Incorporation into Existing Plans:</b>	Local Building Codes/Ordinances

<b>COMMENTS</b>

## SECTION 17: MITIGATION ACTIONS

<b>City of Weslaco – Action #16</b>	
<b>Proposed Action:</b>	Harden/retrofit critical facilities to hazard-resistant levels.
<b>BACKGROUND INFORMATION</b>	
<b>Jurisdiction/Location:</b>	Community critical facilities
<b>Risk Reduction Benefit (Current Cost/ Losses Avoided):</b>	Reduce damages at critical facilities; Ensure continuity of critical services during and after event; Reduce risk of injury to emergency and critical personnel.
<b>Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)</b>	Structure and Infrastructure

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Extreme Heat, Flood, Hail, Hurricane Wind, Lightning, Thunderstorm Wind, Tornado, Wildfire, Winter Storm
<b>Effect on New/Existing Buildings:</b>	Reduce risk to existing structures
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$1,000,000
<b>Potential Funding Sources:</b>	Local Funds, State and Federal Grants
<b>Lead Agency/Department Responsible:</b>	City of Weslaco Administration
<b>Implementation Schedule:</b>	Within 12-24 months of plan adoption
<b>Incorporation into Existing Plans:</b>	Emergency Management Plan; Capital Improvement Plan

<b>COMMENTS</b>

## SECTION 17: MITIGATION ACTIONS

<b>City of Weslaco – Action #17</b>	
<b>Proposed Action:</b>	Develop and implement a plan to have an Information Technology Data Disaster Recovery Site.
<b>BACKGROUND INFORMATION</b>	
<b>Jurisdiction/Location:</b>	Cloud Computing Services and/or another city facility used as data disaster recovery site
<b>Risk Reduction Benefit (Current Cost/ Losses Avoided):</b>	Reduce the risk of data lost; Ensure continuity of essential services provided by city departments.
<b>Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)</b>	Structure and Infrastructure

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Thunderstorm Wind, Tornado, Winter Storm, Hurricane Wind, Wildfire
<b>Effect on New/Existing Buildings:</b>	N/A
<b>Priority (High, Moderate, Low):</b>	High
<b>Estimated Cost:</b>	\$100,000
<b>Potential Funding Sources:</b>	State and Federal Grants
<b>Lead Agency/Department Responsible:</b>	City of Weslaco IT Department
<b>Implementation Schedule:</b>	Within 24 months of plan adoption
<b>Incorporation into Existing Plans:</b>	Emergency Management Plan

<b>COMMENTS</b>

## SECTION 17: MITIGATION ACTIONS

<b>City of Weslaco – Action #18</b>	
<b>Proposed Action:</b>	Complete an updated soil survey for the City of Weslaco. Implement a program to collect expansive soil events/damages for future risk assessments.
<b>BACKGROUND INFORMATION</b>	
<b>Jurisdiction/Location:</b>	City-wide
<b>Risk Reduction Benefit (Current Cost/Losses Avoided):</b>	Enhance the risk assessment for expansive soils; Inform future development decisions by identifying area with high plasticity index ranges; Reduce future losses due to expansive soils.
<b>Type of Action (Local Plans and Regulations, Structure and Infrastructure projects, Natural System Protection, or Education and Awareness)</b>	Local Plans and Regulations

<b>MITIGATION ACTION DETAILS</b>	
<b>Hazard(s) Addressed:</b>	Expansive Soils
<b>Effect on New/Existing Buildings:</b>	Reduce risk to new structures and infrastructure
<b>Priority (High, Moderate, Low):</b>	Low
<b>Estimated Cost:</b>	\$50,000
<b>Potential Funding Sources:</b>	Local Funds, State and Federal Grants, USGS
<b>Lead Agency/Department Responsible:</b>	City of Weslaco Administration
<b>Implementation Schedule:</b>	Within 36 months of plan adoption
<b>Incorporation into Existing Plans:</b>	Capital Improvement Plan

<b>COMMENTS</b>

# SECTION 18: PLAN MAINTENANCE

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  - Monitoring..... 3
  - Evaluation..... 4
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- Continued Public Involvement..... 5

## PLAN MAINTENANCE PROCEDURES

The following is an explanation of how the City of Weslaco, and the general public will be involved in implementing, evaluating, and enhancing the Plan over time. The sustained hazard mitigation planning process consists of four main parts:

- Incorporation
- Monitoring and Evaluation
- Updating
- Continued Public Involvement

## INCORPORATION

The City of Weslaco will be responsible for further development and implementation of mitigation actions. Each action has been assigned to a specific department within the City. The following describes the process by which the City of Weslaco will incorporate elements of the mitigation plan into other planning mechanisms.

### PROCESS OF INCORPORATION

Once the Plan is adopted, the City of Weslaco will implement actions based on priority and the availability of funding. The City currently implements policies and programs to reduce loss of life and property damage from hazards. The mitigation actions developed for this Plan enhance this ongoing effort and will be implemented through other program mechanisms where possible.

The potential funding sources listed for each identified action may be used when the city seeks funds to implement actions. An implementation time period or a specific implementation date has been assigned to each action as an incentive for completing each task and gauging whether actions are implemented in a timely manner.

The City of Weslaco will integrate implementation of their mitigation actions with other plans and policies such as construction standards and emergency management plans, and ensure that these actions, or proposed projects, are reflected in other planning efforts. Coordinating and

# SECTION 18: PLAN MAINTENANCE

integrating components of other plans and policies into goals and objectives of the Plan will further maximize funding and provide possible cost-sharing of key projects, thereby reducing loss of lives and property, and mitigating hazards affecting the area.

Upon formal adoption of the Plan, planning team members from each city department will work to integrate the hazard mitigation strategies into other plans and codes as they are developed. Participating team members will conduct periodic reviews of plans and policies (once per year at a minimum) and analyze the need for amendments in light of the approved Plan. The planning team will review all comprehensive land use plans, capital improvement plans, annual budget reviews, emergency operations or management plans, transportation plans, and any building codes to guide and control development. Departments will ensure that capital improvement planning in the future will also contribute to the goals of this hazard mitigation Plan, in order to reduce the long-term risk to life and property from all hazards. Within 1 year of formal adoption of the hazard mitigation Plan, existing planning mechanisms will be reviewed.

The City of Weslaco will review and revise, as necessary, the long-range goals and objectives in strategic plan and budgets to ensure that they are consistent with this mitigation action plan. Additionally, the City will work to advance the goals of this hazard mitigation plan through its routine, ongoing, long-range planning, budgeting, and work processes.

**Table 18-1. Methods of Incorporation of the Plan**

Planning Mechanism	Incorporation of Plan
Grant Applications	The Plan will be evaluated by the City of Weslaco when grant funding is sought for mitigation projects. If a project is not in the Plan, an amendment may be necessary to include the action in the Plan.
Annual Budget Review	Various departments and key personnel that participated in the planning process for the City of Weslaco will review the Plan and mitigation actions therein when conducting their annual budget review. Allowances will be made in accordance with grant applications sought and mitigation actions that will be undertaken per the implementation schedule of the specific action.
Regulatory Plans	Currently, the City of Weslaco have regulatory plans in place, such as Emergency Management Plans, Continuity of Operations Plans, Land Use Plans, and Evacuation Plans. The Plan will be consulted when City departments review or revise their current regulatory planning mechanisms or in the development of regulatory plans that are not currently in place.
Capital Improvement Plans	The City of Weslaco has a Capital Improvement Plan (CIP) in place. Prior to any revisions to the CIP, City departments will review the risk assessment and mitigation strategy sections of the HMAP, as limiting

## SECTION 18: PLAN MAINTENANCE

Planning Mechanism		Incorporation of Plan
		public spending in hazardous zones is one of the most effective long-term mitigation actions available to local governments.
Floodplain Plans	Management	Floodplain management plans include preventative and corrective actions to address the flood hazard. Therefore, the actions for flooding and information found in Section 5 of this Plan discussing the people and property at risk to flood will be reviewed and revised when the City of Weslaco updates their management plans or develops new plans.

### MONITORING AND EVALUATION

Periodic revisions of the Plan are required to ensure that goals, objectives, and mitigation actions are kept current. Revisions may be required to ensure the Plan is in compliance with federal and state statutes and regulations. This section outlines the procedures for completing Plan revisions, updates, and review. Table 18-2 indicates the jurisdiction and title of the party responsible for Plan monitoring, updating, and review of the Plan. Monitoring, evaluating and updating the plan include the planning process, hazard risk assessment and the mitigation strategies and actions as they are written in the plan. In the paragraphs below when the plan is mentioned it is to include the hazard risk assessment and mitigation actions.

**Table 18-2. Team Members Responsible for Plan Monitoring, Evaluation, Updating, and Review of the Plan**

DEPARTMENT	TITLE
City of Weslaco	Fire Chief / Emergency Management Coordinator
City of Weslaco	Assistant City Manager

### MONITORING

Designated Planning Team members are responsible for monitoring, updating, and reviewing the Plan, as shown in Table 18-2. Individuals holding the title listed in Table 18-2 will be responsible for monitoring the Plan on an annual basis. Plan monitoring includes reviewing the Plan and incorporating other existing planning mechanisms that relate or support goals and objectives of the Plan; monitoring the incorporation of the Plan into future updates of other existing planning mechanisms as appropriate; monitoring team members to maintain updated contact information and ensure availability throughout the planning cycle; reviewing mitigation actions submitted and coordinating with various City departments to determine if mitigation actions need to be re-evaluated and updated; evaluating the hazards that pose a risk to the planning area and updating the risk assessment when warranted; evaluating and updating the Plan as necessary; and monitoring plan maintenance to ensure that the process described is being followed, on an annual basis, throughout the planning process. The Planning Team will develop a brief report that identifies policies and actions in the plan that have been successfully implemented and any

## SECTION 18: PLAN MAINTENANCE

changes in the implementation process needed for continued success. Team meetings for monitoring the plan will include a sign-in sheet to record attendance and a written summary of meeting notes will report the particulars involved in developing an action into a project. In addition to the annual monitoring, the Plan will be similarly reviewed immediately after extreme weather events including but not limited to state and federally declared disasters.

### EVALUATION

As part of the evaluation process, the Planning Team will assess changes in risk; determine whether the implementation of mitigation actions is on schedule; determine whether there are any implementation problems, such as technical, political, legal, or coordination issues; and identify changes in land development or programs that affect mitigation priorities for each respective department or organization.

The Planning Team will meet on an annual basis to evaluate the Plan, identify any needed changes, and assess the effectiveness of the plan achieving its stated purpose and goals. The Executive Planning Team will evaluate the team participants in the last planning cycle to determine if additional participants can contribute further areas of expertise during the current planning cycle and future updates. The team will evaluate the number of mitigation actions implemented along with the loss-reduction associated with each action. Actions that have not been implemented will be evaluated to determine if any social, political or financial barriers are impeding implementation and if any changes are necessary to improve the viability of an action. The team will evaluate changes in land development and/or programs that affect mitigation priorities in their respective areas of authority. This annual evaluation process will include an annual meeting with a sign-in sheet to record attendance and a brief report that identifies any changes that may be necessary. In addition, the Plan will be similarly evaluated immediately after extreme weather events including but not limited to state and federally declared disasters.

### UPDATING

#### PLAN AMENDMENTS

At any time, minor technical changes may be made to update the City of Weslaco Hazard Mitigation Plan. Material changes to mitigation actions or major changes in the overall direction of the Plan or the policies contained within it must be subject to formal adoption by the City.

The City will review proposed amendments and vote to accept, reject, or amend the proposed change. Upon ratification, the amendment will be transmitted to the Texas Division of Emergency Management (TDEM) for review and forwarding to FEMA for final approval of amendment.

In determining whether to recommend approval or denial of a Plan amendment request, the City will consider the following factors:

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

#### FIVE (5) YEAR REVIEW

The Plan will be thoroughly reviewed by the Planning Team at the end of 3 years from the approval date to determine whether there have been significant changes in the planning area that

## SECTION 18: PLAN MAINTENANCE

necessitate changes in the types of mitigation actions proposed. Factors that may affect the content of the Plan include new development in identified hazard areas, increased exposure to hazards, disaster declarations, an increase or decrease in capability to address hazards, and changes to federal or state legislation.

The Plan review process provides the City an opportunity to evaluate mitigation actions that have been successful, identify losses avoided due to the implementation of specific mitigation measures, and address mitigation actions that may not have been successfully implemented as assigned.

It is recommended that the full Planning Team (Section 2, Table 2-2) meet to review the Plan at the end of 3 years because grant funds may be necessary for the development of a 5-year update. Reviewing planning grant options in advance of the 5-year Plan update deadline is recommended considering the timelines for grant and planning cycles can be in excess of a year.

Following the Plan review, any revisions deemed necessary will be summarized and implemented according to the reporting procedures and Plan amendment process outlined herein. Upon completion of the review, update, and amendment process, the revised Plan will be submitted to TDEM for final review and approval in coordination with the Federal Emergency Management Agency (FEMA).

## CONTINUED PUBLIC INVOLVEMENT

Public input was an integral part of the preparation of this Plan and will continue to be essential for Plan updates. The Public will be directly involved in the implementation, monitoring and evaluation. Changes or suggestions to improve or update the Plan will provide opportunities for additional public input.

The public can review the Plan on the City of Weslaco's website and provide comment via email. Notification that the Plan is available for review and comment will be made via social media outlets.

The Planning Team may also designate voluntary citizens from the City or willing stakeholder members from the private sector businesses that were involved in the Plan's development to provide feedback on an annual basis. It is important that stakeholders and the immediate community maintain a vested interest in preserving the functionality of the planning area as it pertains to the overall goals of the mitigation plan. The Planning team is responsible for notifying stakeholders and community members on an annual basis, and maintaining the Plan.

Media, including local newspapers and radio stations, will be used to notify the public of any maintenance or periodic review activities during the implementation, monitoring, and evaluation phases. Additionally, local news media will be contacted to cover information regarding Plan updates, status of grant applications, and project implementation. Local and social media outlets, such as Facebook and Twitter, will keep the public and stakeholders apprised of potential opportunities to fund and implement mitigation projects identified in the Plan. Social media outlets have been successful in communicating in the past and will continue to be utilized to not only inform the public of progress but utilized to create public awareness of activities and the need for their involvement going forward.

# APPENDIX A: PLANNING TEAM

Planning Team Members ..... 1  
 Stakeholders ..... 2

## PLANNING TEAM MEMBERS

The City of Weslaco Plan 2020 (Plan), was organized using a direct representative model. An Executive Planning Team from the City of Weslaco, shown in Table A-1, was formed to coordinate planning efforts and request input and participation in the planning process. Table A-2 reflects the Advisory Planning Team, consisting of additional representatives from city departments that participated throughout the planning process. Table A-3 is comprised of stakeholders who were invited to provide Plan input. Public outreach efforts and meeting documentation is provided in Appendix D.

**Table A-1. Executive Planning Team**

DEPARTMENT	TITLE
City of Weslaco	Fire Chief / Emergency Management Coordinator
City of Weslaco	Assistant City Manager

**Table A-2. Advisory Planning Team**

DEPARTMENT	TITLE
City of Weslaco	City Manager
City of Weslaco	Director Planning Code Enforcement
City of Weslaco	City Engineer
City of Weslaco	Health Official
City of Weslaco	Fire Marshal
City of Weslaco	Public Works
City of Weslaco	IT Director
City of Weslaco	Chief of Police
City of Weslaco	Police Captain
City of Weslaco	City Secretary
City of Weslaco	Finance Director

## APPENDIX A: PLANNING TEAM

DEPARTMENT	TITLE
City of Weslaco	Fire / EMS Lieutenant
City of Weslaco	Assistant Chief of Police
City of Weslaco	Public Information Officer
City of Weslaco	Emergency Manager
City of Weslaco	Assistant Public Works Director
City of Weslaco	Airport

## STAKEHOLDERS

The following groups listed in Table A-3 represent a list of organizations invited to stakeholder meetings, public meetings, and workshops throughout the planning process and include: non-profit organizations, private businesses, universities, and legislators. The public were also invited to participate via e-mail throughout the planning process. Many of the invited organizations and stakeholders participated and were integral to providing comments and data for the Plan Update. For a list of attendees at meetings, please see Appendix D<sup>1</sup>.

**Table A-3. Stakeholders**

AGENCY	TITLE
911 Center	Public Safety Director
AEP	Manager, External Affairs
City of McAllen	WWCS Manager
Economic Development Corporation of Weslaco	Executive Director
First Baptist Church	Senior Pastor
HEB North Texas / Westgate / Distribution Warehouse	Public Affairs Specialist
Hidalgo County	Chief/Emergency Management Coordinator
Knapp Medical Center	Trauma Center Coordinator
South Texas Health Systems	Emergency Preparedness Coordinator
Texas House District 39	Representative
Texas Senate District 27	Senator
University of Texas Rio Grande Valley	Emergency Management Coordinator

<sup>1</sup> Information contained in Appendix E is exempt from public release under the Freedom of Information Act (FOIA).

## APPENDIX A: PLANNING TEAM

AGENCY	TITLE
Valley Baptist Medical Center	Business Development
Weslaco Independent School District	Employee Benefits Risk Management Director

# APPENDIX B: PUBLIC SURVEY RESULTS

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Overview .....	1
Public Survey Results .....	2

## OVERVIEW

The City of Weslaco prepared a public survey that requested public opinion on a wide range of questions relating to natural hazards. The survey was made available on the City of Weslaco’s website. This survey link was also distributed at public meetings and stakeholder events throughout the planning process.

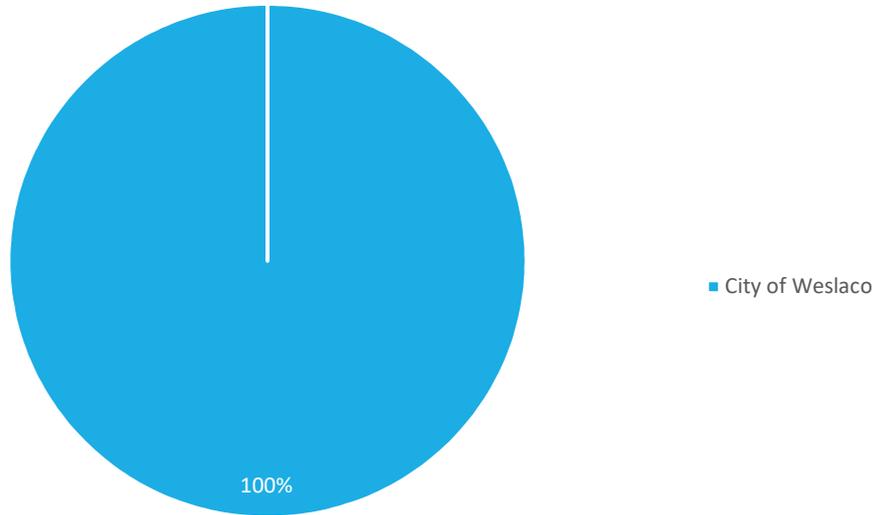
A total of 3 surveys were collected, the results of which are analyzed in Appendix B. The purpose of the survey was twofold: 1) to solicit public input during the planning process, and 2) to help the jurisdictions identify any potential actions or problem areas.

The following survey results depict the percentage of responses for each answer. Similar responses have been summarized for questions that did not provide a multiple-choice answer or that required an explanation.

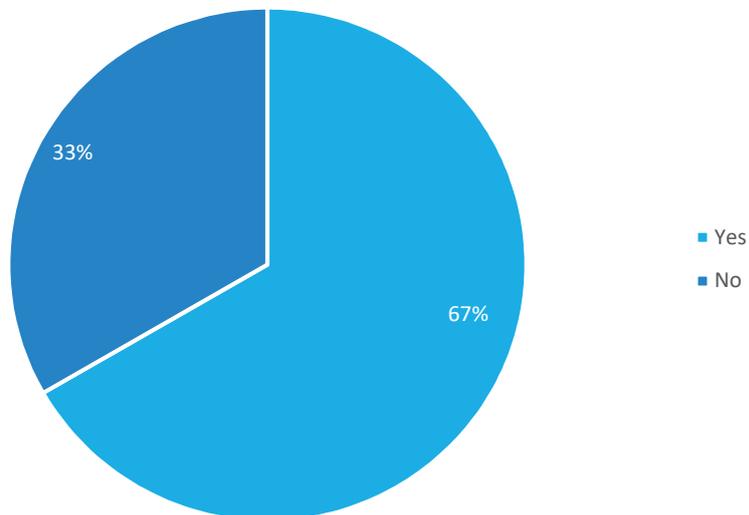
## APPENDIX B: PUBLIC SURVEY RESULTS

### PUBLIC SURVEY RESULTS

1. Please state the jurisdiction (city and community) where you reside.

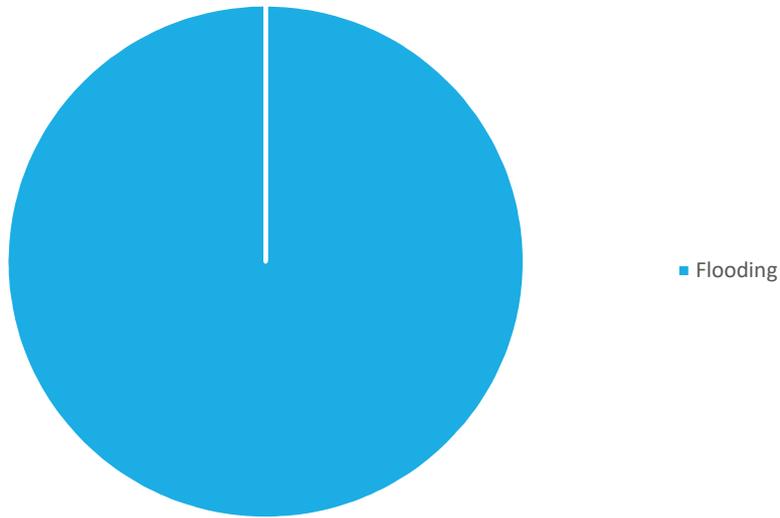


2. A. Have you ever experienced or been impacted by a disaster?

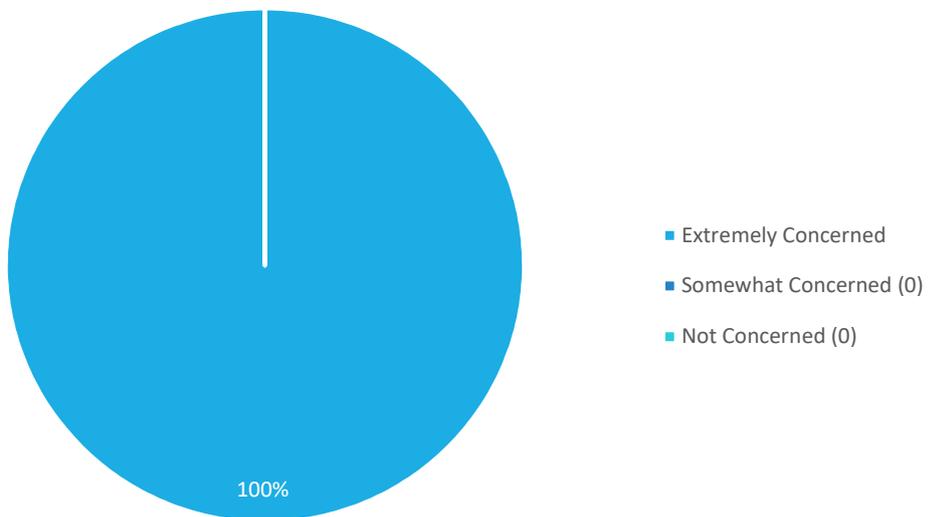


## APPENDIX B: PUBLIC SURVEY RESULTS

2. B. If “Yes”, please explain:

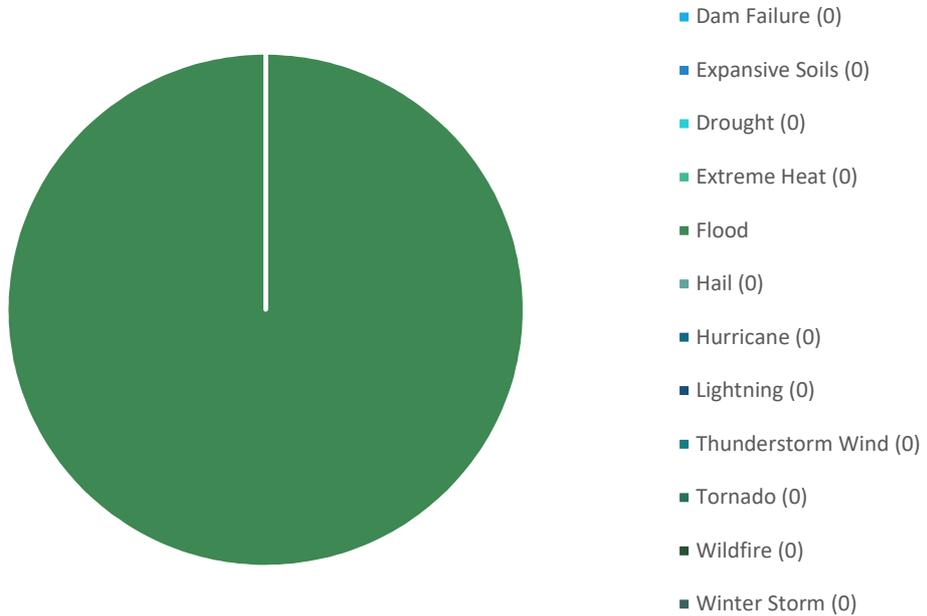


3. How concerned are you about the possibility of your community being impacted by a disaster?

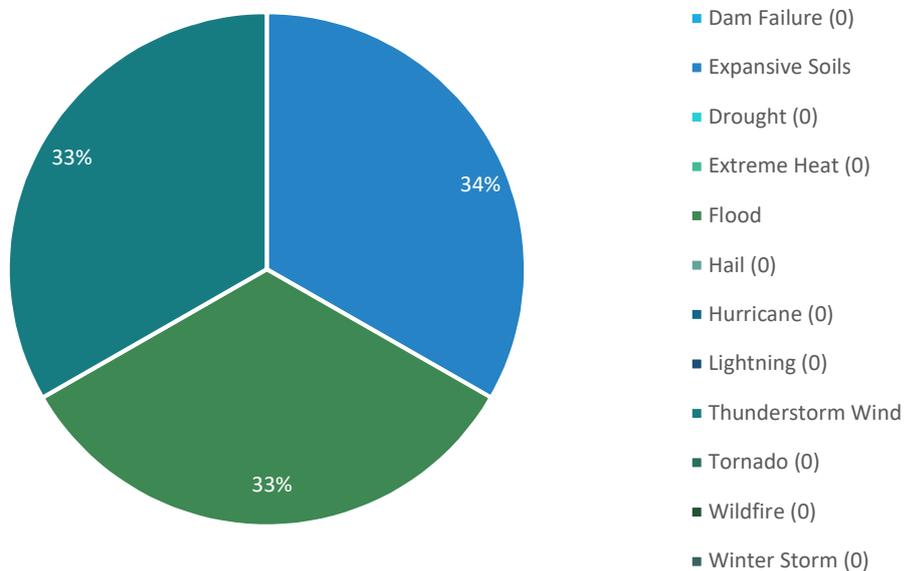


## APPENDIX B: PUBLIC SURVEY RESULTS

4. Please select the one hazard you think is the highest threat to your neighborhood:

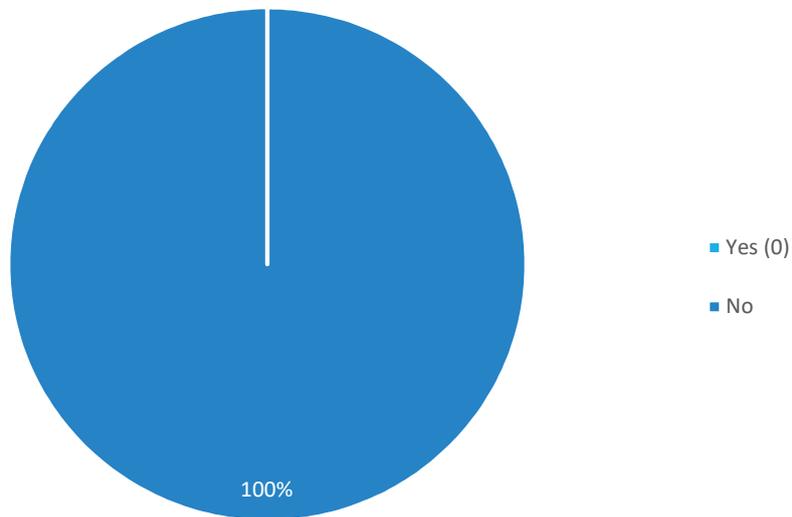


5. Please select the one hazard you think is the second highest threat to your neighborhood:



## APPENDIX B: PUBLIC SURVEY RESULTS

6. A. Are there hazards not listed above that you think is a wide-scale threat to your neighborhood?

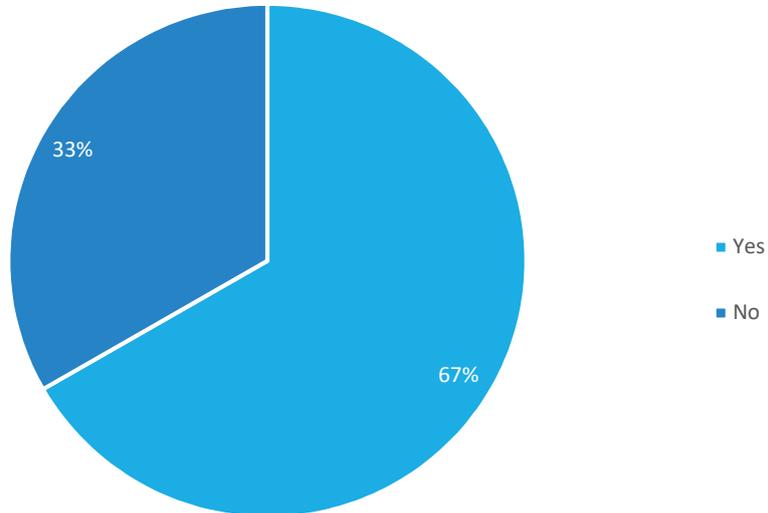


6. B. If "Yes", please explain:

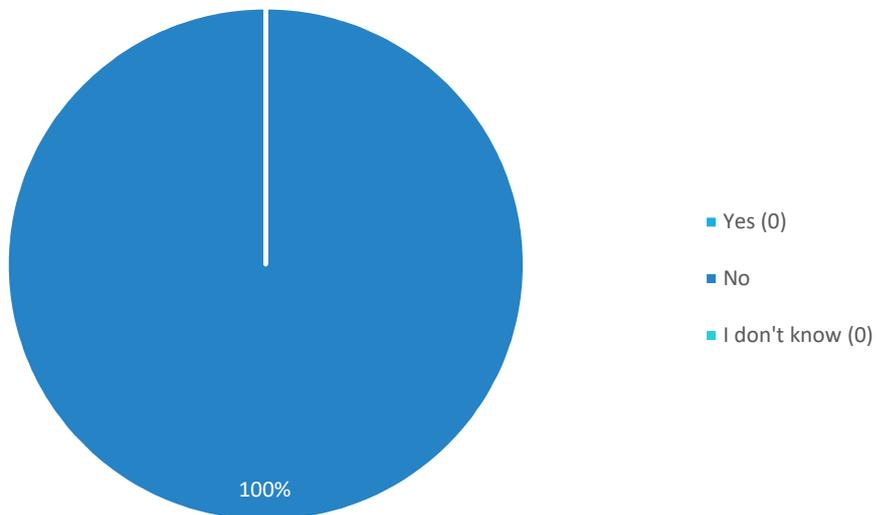
No Answers of "Yes" on question 6 A.

## APPENDIX B: PUBLIC SURVEY RESULTS

7. Is your home located in a floodplain?

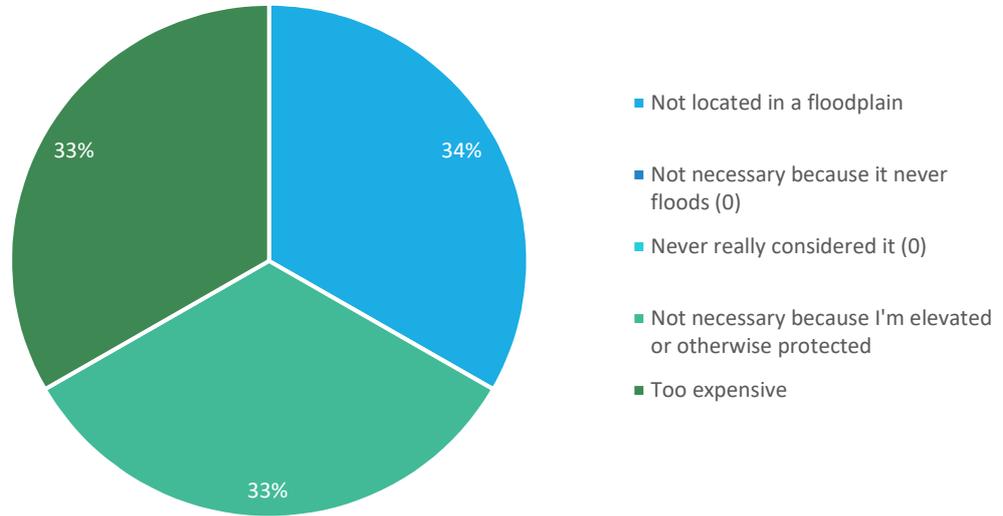


8. Do you have flood insurance?

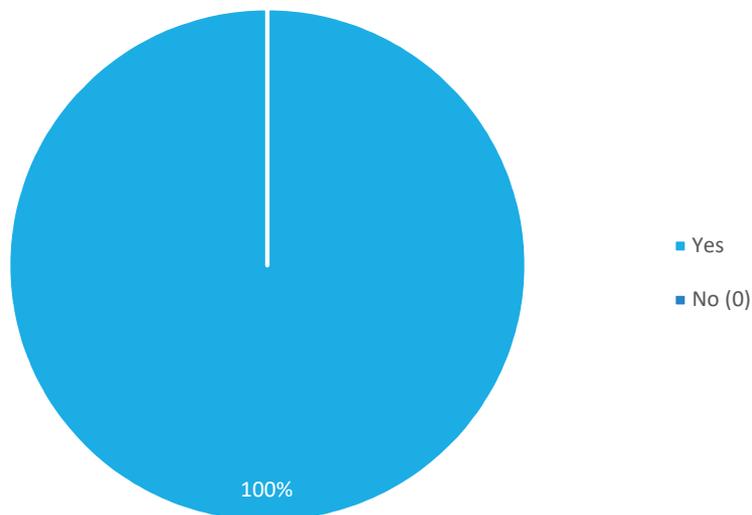


## APPENDIX B: PUBLIC SURVEY RESULTS

9. If you do not have flood insurance, why not?

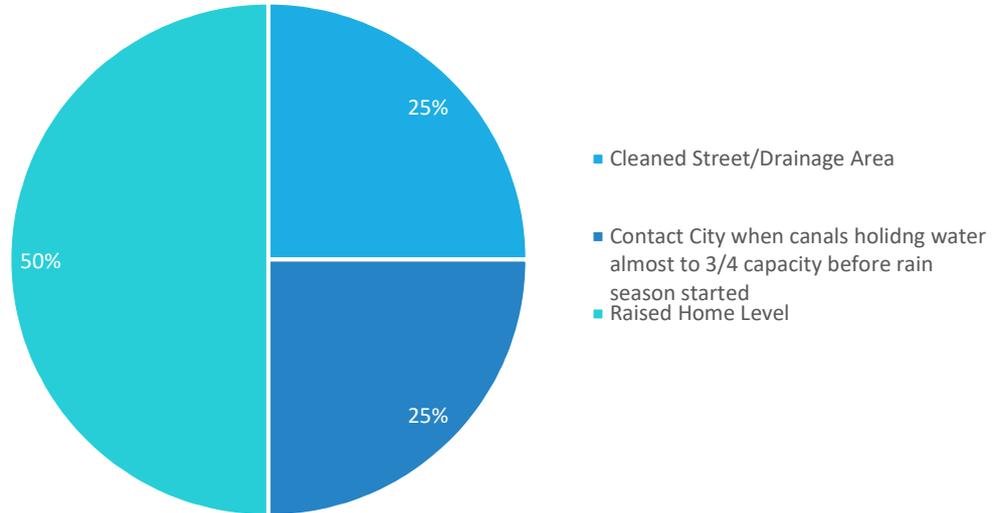


10. A. Have you taken any actions to make your home or neighborhood more resistant to hazards?

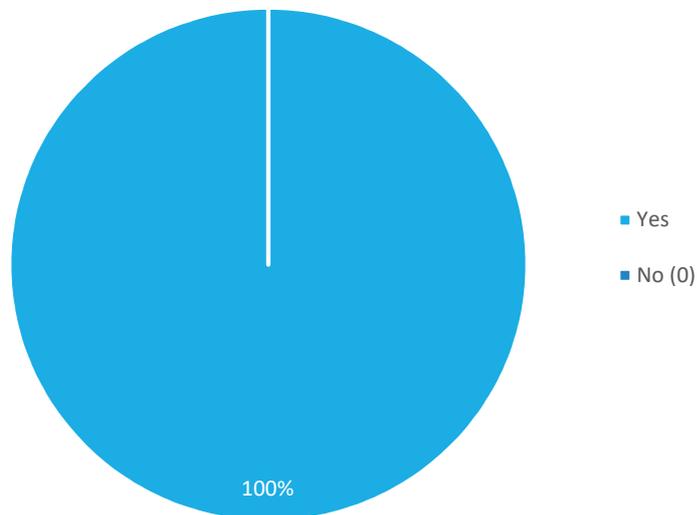


## APPENDIX B: PUBLIC SURVEY RESULTS

10. B. What have you done?

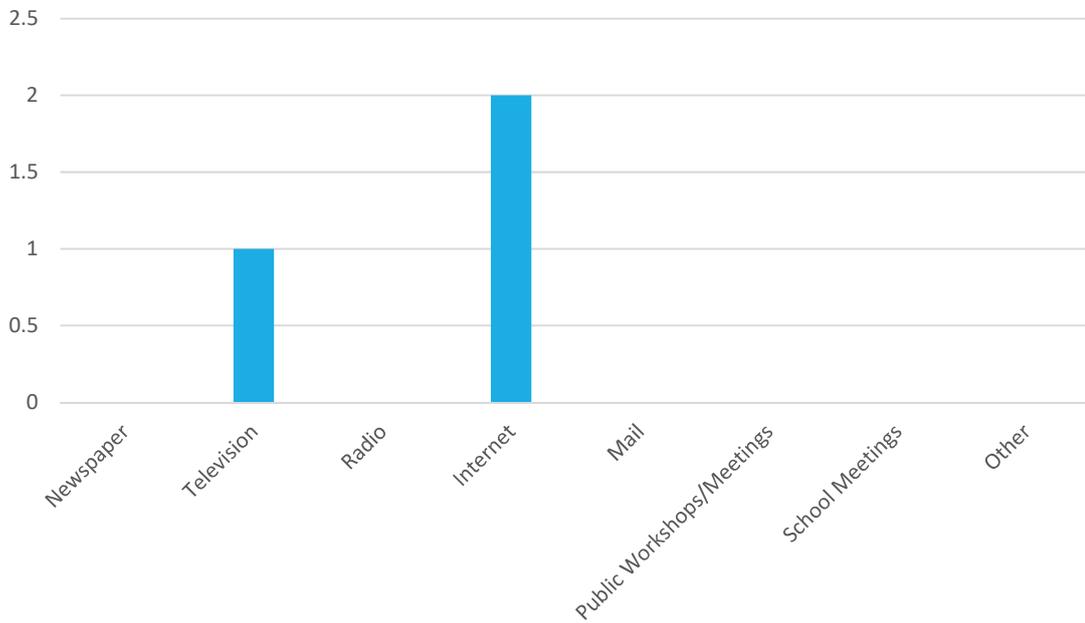


11. Are you interested in making your home or neighborhood more resistant to hazards?



## APPENDIX B: PUBLIC SURVEY RESULTS

12. A. What is the most effective way for you to receive information about how to make your home and neighborhood more resistant to hazards?

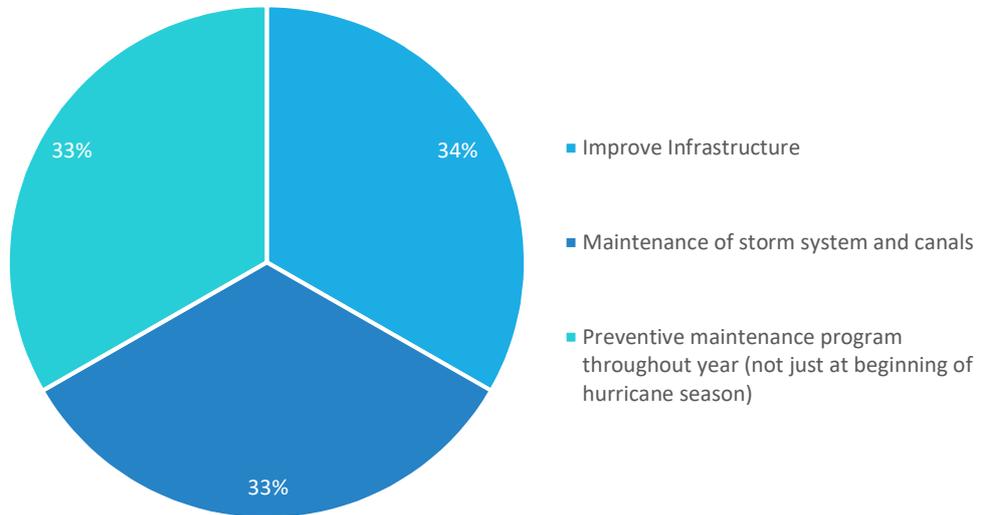


12. B. If "Other", please specify:

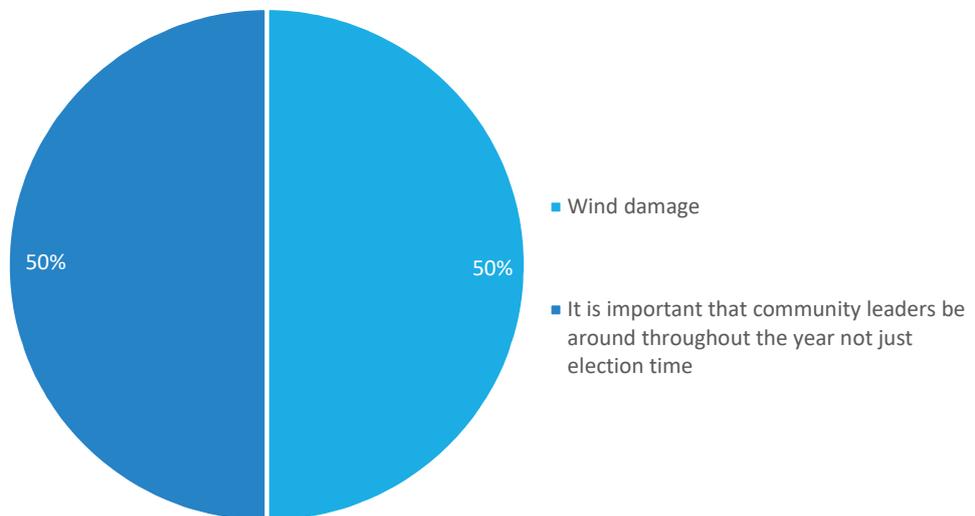
No answers of "Other" on question 12 A.

## APPENDIX B: PUBLIC SURVEY RESULTS

13. In your opinion, what are some steps your local government could take to reduce or eliminate the risk of future hazard damages in your neighborhood?

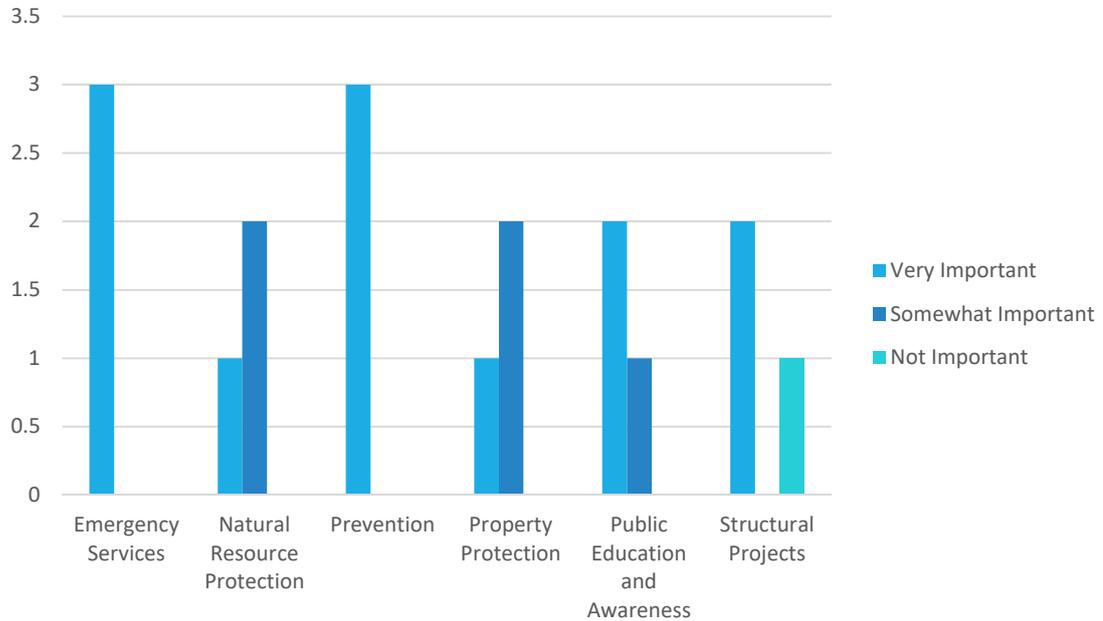


14. Are there any other issues regarding the reduction of risk and loss associated with hazards or disasters in the community that you think are important?



## APPENDIX B: PUBLIC SURVEY RESULTS

15. A number of community-wide activities can reduce the risk from hazards. In general, these activities fall into one of the following six broad categories. Please tell us how important you think each one is for your community to consider pursuing.



**Emergency Services** - Actions that protect people and property during and immediately after a hazard event. Examples include warning systems, evacuation planning, emergency response training, and protection of critical facilities or systems.

**Natural Resource Protection** - Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. Examples include floodplain protection, habitat preservation, slope stabilization, riparian buffers, and forest management.

**Prevention / Local Plans & Regulations** - Administrative or regulatory actions that influence the way land is developed and buildings are built. Examples include planning and zoning, building codes, open space preservation, and floodplain regulations.

**Property Protection** - Actions that involve the modification of existing buildings to protect them from a hazard or removal from the hazard area. Examples include acquisition, relocation, elevation, structural retrofits, and storm shutters.

**Public Education and Awareness** - Actions to inform citizens about hazards and techniques they can use to protect themselves and their property. Examples include outreach projects, school education programs, library materials, and demonstration events.

**Structural Projects** - Actions intended to lessen the impact of a hazard by modifying the natural progression of the hazard. Examples include dams, levees, seawalls detention / retention basins, channel modification, retaining walls, and storm sewers.

# APPENDIX C: CRITICAL FACILITIES

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Overview ..... 1  
City of Weslaco Critical Facilities ..... **Error! Bookmark not defined.**

## OVERVIEW

This Appendix is **For Official Use Only (FOUO)** and may be exempt from public release under FOIA.

APPENDIX C: CRITICAL FACILITIES

# APPENDIX D: MEETING DOCUMENTATION

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Appendix D is **For Official Use Only (FOUO)** and may be exempt from public release under the Freedom of Information Act (FOIA).

# APPENDIX D: MEETING DOCUMENTATION

## Figure D-1. City of Weslaco Kickoff Workshop, 02/20/20




**CITY OF WESLACO HAZARD MITIGATION PLAN**  
**Kickoff Workshop**  
**Weslaco EDC Business Center**  
**275 South Kansas Avenue, Weslaco, TX 78596**  
**February 20, 2020**

Name/Title	Department	Phone	Email
<i>Antonio Lopez Fire Chief/EMC WFD/ORM</i>		<i>956-447-3415</i>	<i>ALopez@weslacotx.gov</i>
<i>Robert Lopez</i>	<i>Weslaco Police Dept.</i>	<i>956-451-8437</i>	<i>rlopez@weslacotx.gov</i>
<i>Joe Rodriguez</i>	<i>P/CE</i>	<i>956-447-3411</i>	<i>jrodriguez@weslacotx.gov</i>
<i>Vidal Roman</i>	<i>Finance</i>	<i>956-209-1293</i>	<i>V.Roman@weslacotx.gov</i>
<i>RICH STUBBS</i>	<i>WFD/ORM</i>	<i>956-447-3287</i>	<i>RSTUBBS@weslacotx.gov</i>
<i>Martin Hela</i>	<i>IT</i>	<i>956-316-0312</i>	<i>mhela@weslacotx.gov</i>
<i>Gerardo Oliva</i>	<i>Weslaco Police</i>	<i>(956)650-0938</i>	<i>joliva@weslacotx.gov</i>

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**CITY OF WESLACO HAZARD MITIGATION PLAN**  
**Kickoff Workshop**  
**Weslaco EDC Business Center**  
**275 South Kansas Avenue, Weslaco, TX 78596**  
**February 20, 2020**

Name/Title	Department	Phone	Email
<i>Andrew Monz</i>	<i>City Manager/Assistant</i>	<i>(561) 469-0291</i>	<i>amonz@weslacotx.gov</i>
<i>Rafael de la Fuente</i>	<i>P/CE Director</i>	<i>447-3401</i>	<i>rde lafuente@weslacotx.gov</i>
<i>Mike Lopez</i>	<i>City Mgr</i>	<i>956 968-3141</i>	<i>mlopez@weslacotx.gov</i>
<i>Albert Aldana</i>	<i>City Engineer</i>	<i>956 969 0570</i>	<i>aldana@weslacotx.gov</i>

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# APPENDIX D: MEETING DOCUMENTATION

**Figure D-2. City of Weslaco Risk Assessment /  
Mitigation Strategy Workshop Webinar, 05/28/20**




**CITY OF WESLACO HAZARD MITIGATION PLAN  
Risk Assessment and Mitigation Strategy Workshop  
Adobe Connect Webinar  
May 28, 2020**

Name/Title	Department	Title	Email	Phone
Richard Stubbs	City of Weslaco	Fire/EMS Lieutenant	rstubbs@weslacotx.gov	956-447-3287
Joe Pedraza	City of Weslaco	Health Official	jpedraza@weslacotx.gov	956-821-6538
Cristina Garcia	City of Weslaco	Public Information Officer	cgarcia@weslacotx.gov	956-357-4851
Lisa Chambers	H2O Partners	Mitigation Specialist	lchambers@h2opartnersusa.com	512-540-0464
Rhonda Murphy	H2O Partners	Mitigation Planner	rmurphy@h2opartnersusa.com	214-707-0056
Gerardo Oliva	City of Weslaco	Captain	joliva@weslacotx.gov	956-650-0938
Andrew Munoz	City of Weslaco	Asst. City Manager	Amunoz@weslacotx.gov	956-969-0291
J. Martin Vela	Hidalgo County	IT Director	jvela@weslacotx.gov	956-968-6253
Rebekah De La Fuente	City of Weslaco	Planning & Code Enforcement Director	rdela Fuente@weslacotx.gov	956-447-3401
Joel Rivera	City of Weslaco	Chief of Police	joel.rivera@weslacotx.gov	956-975-6444
Heather Ferrara	H2O Partners	Program Manager	heather@h2opartnersusa.com	205-586-6616
Heidi Watson	H2O Partners	Mitigation Specialist	heidi@h2opartnersusa.com	512-568-2259

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**CITY OF WESLACO HAZARD MITIGATION PLAN  
Risk Assessment and Mitigation Strategy Workshop  
Adobe Connect Webinar  
May 28, 2020**

Name/Title	Department	Title	Email	Phone
Antonio Lopez	City of Weslaco	Fire Chief / EMC	anlopez@weslacotx.gov	956-447-3415
Vidal Roman	City of Weslaco	Finance Director	vroman@weslacotx.gov	956-968-3181
Mike Perez	City of Weslaco	City Manager	mperez@weslacotx.gov	956-968-3181
Alex Cavazos	City of Weslaco	Emergency Manager	acavazos@weslacotx.gov	
Albert Aldana	City of Weslaco	City Engineer	aaldana@weslacotx.gov	956-968-3181
Olga Garza	City of Weslaco Public Works	Assistant Public Works Director	ogarza@weslacotx.gov	956-447-3415
Joanna Fernandez	City of Weslaco Airport		jfernandez@weslacotx.gov	956-969-0291
Damiane Bembry	City of Weslaco		dbembry@weslacotx.gov	

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# APPENDIX D: MEETING DOCUMENTATION

## PUBLIC MEETING DOCUMENTATION

As discussed in Section 2, public meetings were held throughout the planning process. Documentation in the form of sign-in sheets for each of the meetings follows.

**Figure D-3. City of Weslaco Kickoff Public Meeting, 02/20/20**



**CITY OF WESLACO HAZARD MITIGATION PLAN**  
**Kick-off Public Meeting**  
**Weslaco EDC Business Center**  
**275 South Kansas Avenue, Weslaco, TX 78596**  
**February 20, 2020**

Name/Title	Department	Title	Email	Phone
Eric Howard	H2O Partners	Vice President	Eric@h2opartnersusa.com	512-940-9300
Rick Stubbs	City of Weslaco	Emergency Manager	rstubbs@weslacotx.gov	956-447-3415
Joe Pedraza	City of Weslaco	Assistant Director Planning Code Enforcement	jpandraza@weslacotx.gov	956-447-3401
Gerardo Oliva	City of Weslaco	Police Captain	jolivia@weslacotx.gov	956-968-8591

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# APPENDIX D: MEETING DOCUMENTATION

**Figure D-4. City of Weslaco Risk Assessment /  
Mitigation Strategy Public Meeting, 05/28/20**




**CITY OF WESLACO HAZARD MITIGATION PLAN  
Risk Assessment and Mitigation Strategy Public Meeting  
Adobe Connect Webinar  
May 28, 2020**

Name/Title	Department	Title	Email	Phone
Richard Stubbs	City of Weslaco	Fire/EMS Lieutenant	rstubbs@weslacotx.gov	956-447-3287
J. Martin Vela	City of Weslaco	IT Director	jvela@weslacotx.gov	956-968-6253
Joe Pedraza	City of Weslaco	Health Official	jpedraza@weslacotx.gov	956-447-3401
Joel Rivera	City of Weslaco	Police Chief	joel.rivera@weslacotx.gov	956-973-4800
Heather Ferrara	H2O Partners	Program Director	heather@h2opartnersusa.com	205-586-6616
Rhonda Murphy	H2O Partners	Mitigation Planner	rmurphy@h2opartnersusa.com	214-707-0056
Mike Perez	City of Weslaco	City Manager	mrperez@weslacotx.gov	956-968-3181
Julio R. Oviedo	City of McAllen	WWCS Manager	joviedo@mcallen.net	956-681-1630
Edward Mejia	NA	NA	edmejia30@gmail.com	956-495-0774

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# APPENDIX D: MEETING DOCUMENTATION

## PUBLIC NOTICES

Public notices to announce the City of Weslaco's participation in the Plan development process were posted on various websites and Facebook, as shown in Figures D-5 through D-7.

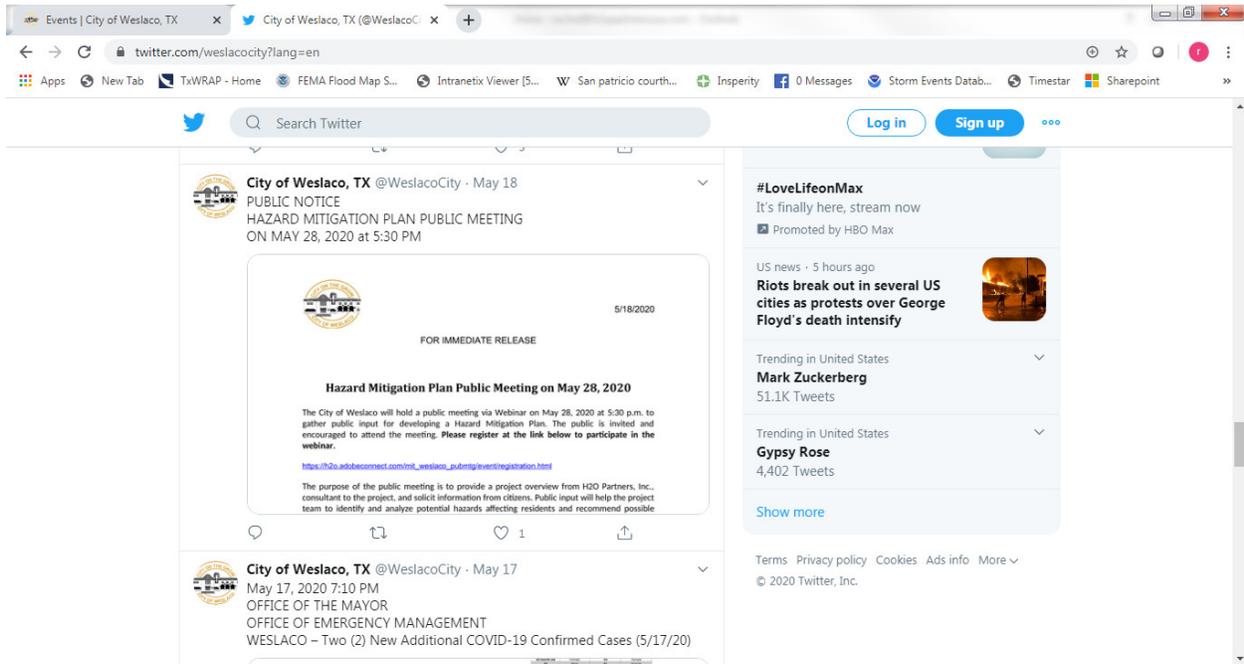
**Figure D-5. Public Notice, City of Weslaco Website, 02/20/20 Public Meeting**

The screenshot shows the 'Open Meetings' page on the City of Weslaco website. The page features a navigation menu with 'Home', 'About', 'Departments', 'Open Government', 'News & Press', 'Events', and 'Contact'. A 'PLAY VIDEO' button is also present. The main content area is titled 'OPEN GOVERNMENT' and includes a statement about transparency and a search bar. Below this, a disclaimer states: 'THE CITY SECRETARY IS RESPONSIBLE FOR THE POSTING OF THE WESLACO CITY COMMISSION AGENDAS AS PER THE TEXAS OPEN MEETINGS LAW. PREVIOUS AGENDAS PRIOR TO JULY 19, 2016 CAN BE FOUND [HERE](#).' A table lists several meetings with their dates and times, and a 'Download' button is visible next to the entries. At the bottom, there is a 'Most Recent Events' section with a 'Category' dropdown menu.

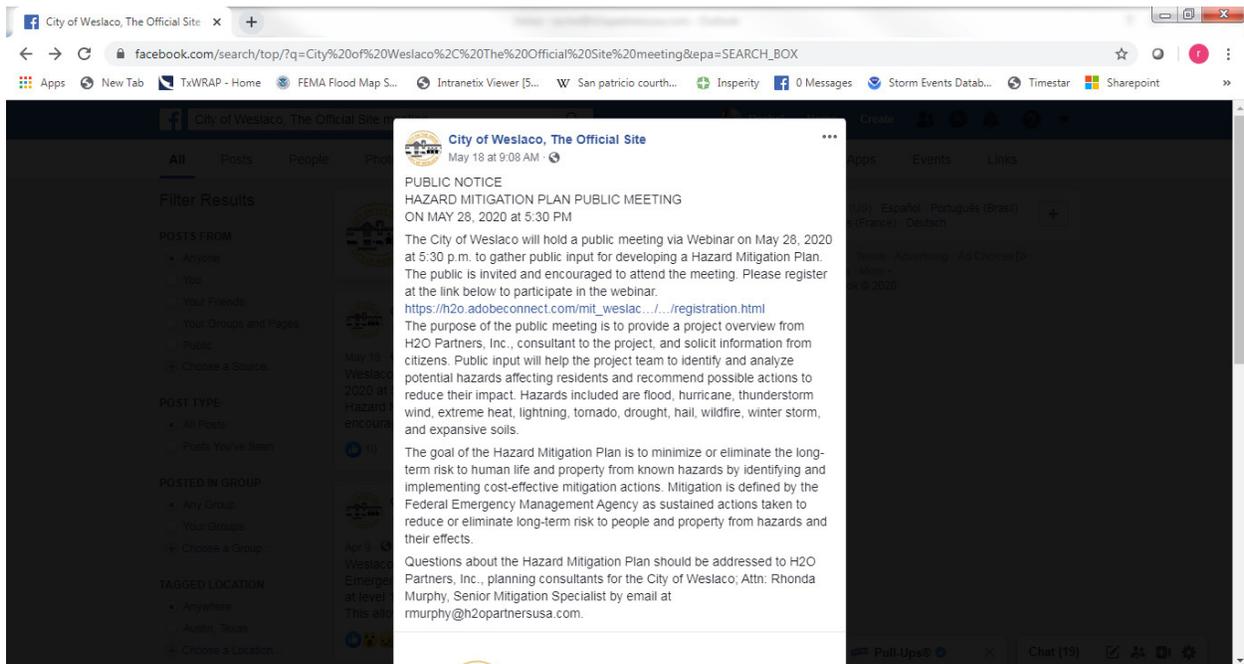
Meeting Name	Date and Time	Action
<a href="#">Airport Advisory Committee Meeting</a>	2/13/2020 8:30 AM	Download
<a href="#">City Commission Regular Meeting</a>	2/18/2020 5:30 PM	
<a href="#">Hazard Mitigation Plan Meeting</a>	2/20/2020 7:00 PM	Download
<a href="#">City Commission Regular Meeting</a>	3/3/2020 5:30 PM	
<a href="#">City Commission Regular Meeting</a>	3/3/2020 5:30 PM	
<a href="#">Planning and Zoning Commission</a>	3/4/2020 5:30 PM	
<a href="#">Planning and Zoning Commission</a>	4/1/2020 5:30 PM	
<a href="#">Planning and Zoning Commission</a>	5/6/2020 5:30 PM	

# APPENDIX D: MEETING DOCUMENTATION

## Figure D-6. Public Notice, City of Weslaco Twitter, 05/28/20 Public Meeting



## Figure D-7. Public Notice, City of Weslaco Facebook, 05/28/20 Public Meeting



# APPENDIX E: CAPABILITY ASSESSMENT

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Appendix E is **For Official Use Only (FOUO)** and may be exempt from public release under the Freedom of Information Act (FOIA).