



SECTION 1. INTRODUCTION

1.1 Purpose

Fort Bend County and its participating jurisdictions (the Planning Area) have prepared this multi-hazard mitigation plan to better protect the residents and property throughout the Planning Area from the effects of hazard events. This plan demonstrates the Planning Area's commitment to reducing risk from hazards, increasing resilience overall, and providing a tool to help decision-makers integrate mitigation in their day-to-day processes. This plan was also developed to position the Planning Area for eligibility for pre- and post-disaster Federal Emergency Management Agency (FEMA) grants, including Hazard Mitigation Assistance (HMA) grant programs, which include Hazard Mitigation Grant Program (HMGP), Building Resilient Infrastructure and Communities (BRIC), and Flood Mitigation Assistance (FMA). This plan also aligns with the planning elements of the National Flood Insurance Program's (NFIP) Community Rating System (CRS), which provides for lower flood insurance premiums in CRS communities.

1.2 Background

A Hazard Mitigation Plan (HMP) is a living document that communities use to reduce their vulnerability to hazards. It forms the foundation for a community's long-term strategy to reduce disaster losses and creates a framework for decision-making to reduce damage to lives, property, and the economy from future disasters. Examples of mitigation projects include home acquisitions or elevations to remove structures from high-risk areas, upgrades to critical public facilities, and infrastructure improvements. Ultimately, these actions reduce vulnerability, and communities are able to recover more quickly from disasters. The Planning Area has demonstrated its commitment to reducing disaster losses by initially developing its HMP in 2018 and updating information upon which to base a successful mitigation strategy to reduce the impacts of natural disasters and to increase the resiliency of the Planning Area.

Hazard Mitigation is any sustained action taken to reduce or eliminate the long-term risk and effects that can result from specific hazards.

FEMA defines a **Hazard Mitigation Plan** as the documentation of a state or local government evaluation of natural hazards and the strategies to mitigate such hazards.

In response to the requirements of the Disaster Mitigation Act of 2000 (DMA 2000), which requires local governmental agencies to develop and update their HMP every five years, this plan serves as the 2023 update to the 2018 Fort Bend County HMP. During the course of the planning process, the entire plan was updated with a focus on examining changes in vulnerability due to hazard events, reviewing capabilities and how they implement hazard mitigation, reviewing the mitigation strategy, and identifying new initiatives to increase overall resiliency in the Planning Area.

1.3 Plan Organization

The Fort Bend County HMP 2023 Update is organized as a two-volume plan and aligns with the Texas Division of Emergency Management (TDEM) planning requirements, the 2013 FEMA Local Mitigation Planning Handbook, and the FEMA Local Mitigation Plan Review Tool.



Volume I provides information on the overall planning process and hazard profiling and vulnerability assessments, which serve as a basis for understanding risk and identifying mitigation actions. As such, Volume I is intended for use as a resource for ongoing mitigation analysis.

Volume II provides an annex dedicated to each participating jurisdiction. Each annex summarizes the jurisdiction's legal, regulatory, and fiscal capabilities; identifies vulnerabilities to hazards; documents mitigation plan integration with other planning efforts; records status of past mitigation actions; and presents an individualized mitigation strategy. The annexes are intended to provide a useful resource for each jurisdiction for implementation of mitigation projects and future grant opportunities as well as a place for each jurisdiction to record and maintain their local aspect of the multi-jurisdictional plan.

Volume I of this HMP includes the following sections:

- Section 1:** Introduction: Overview of the planning process and layout of the plan.
- Section 2:** Planning Process: Description of the HMP methodology and development process; Steering Committee, Planning Committee, Planning Partnership, and stakeholder involvement efforts; and a description of how this HMP will be incorporated into existing programs.
- Section 3:** County Profile: Overview of the Planning Area, including: (1) physical setting, (2) land use, (3) land use trends, (4) population and demographics, (5) general building stock, and (6) critical facilities and lifelines.
- Section 4:** Risk Assessment: Documentation of the hazard identification and hazard risk ranking process, hazard profiles, and findings of the vulnerability assessment (estimates of the impact of hazard events on life, safety, health, general building stock, critical facilities, the economy); description of the status of local data; and planned steps to improve local data to support mitigation planning.
- Section 5:** Capability Assessment: A summary and description of the existing plans, programs, and regulatory mechanisms at all levels of government (federal, state, county, local) that support hazard mitigation within the Planning Area.
- Section 6:** Mitigation Strategy: This section provides information regarding the mitigation goals and objectives in response to priority hazards of concern and the process by which Planning Area mitigation strategies have been developed or updated.
- Section 7:** Plan Maintenance: System established to continue to monitor, evaluate, maintain, and update the HMP.

Volume II of this plan includes the following sections:

- Section 8:** Planning Partnership: Description of the Planning Partnership, their responsibilities, and Jurisdictional annexes.
- Section 9:** Annexes: Jurisdiction-specific annexes for Fort Bend County containing their hazards of concern, hazard ranking, capability assessment, mitigation actions, action prioritization specific only to Fort Bend County, progress on prior mitigation activities (as applicable), and a discussion of prior local HMP integration into local planning processes.



Appendices include the following:

- Appendix A:** Plan Adoption: Resolutions from Fort Bend County and all participating jurisdiction included as each formally adopts the HMP update.
- Appendix B:** Participation Documentation: Matrix to give a broad overview of who attended meetings and when input was provided to the HMP update and additional worksheets submitted during workshops conducted throughout the planning process.
- Appendix C:** Meeting Documentation: Agendas, attendance sheets, minutes, and other documentation (as available and applicable) of planning meetings convened during the development of the plan.
- Appendix D:** Public and Stakeholder Outreach Documentation: Documentation of the public and stakeholder outreach effort, including webpages, informational materials, public and stakeholder meetings and presentations, surveys, and other methods used to receive and incorporate public and stakeholder comment and input to the plan process.
- Appendix E:** Mitigation Strategy Supplementary Data: Documentation of the broad range of actions identified during the mitigation process; types of mitigation actions; the mitigation catalog developed using jurisdiction input and potential mitigation funding sources.
- Appendix F:** Plan Maintenance Tools: Examples of plan review tools and templates available to support annual plan review.
- Appendix G:** Linkage Procedures: Steps non-participating local governments and other local jurisdictions such as Fire Districts, Utility Districts, School Districts, and any other eligible local government as defined in 44 CFR 201.2 within the Planning Area can take to join this plan as a participating jurisdiction and to ultimately achieve approved status.
- Appendix H:** Critical Facilities: Full list of critical facilities identified for the update of the HMP. Due to the sensitive nature of the information, critical facility details have been redacted.

1.4 2023 HMP Update – What Is Different?

The 2023 HMP update builds on the previous plan and includes the following changes and enhancements:

- Updated data and tools offer more detailed and accurate risk assessment. The risk assessment was prepared to better support future grant applications by providing risk and vulnerability information that would directly support the measurement of “cost-effectiveness” required under FEMA mitigation grant programs.
- The plan identifies implementable actions with enough information to serve as the basis for policy and funding decisions and represent measurable impacts on resiliency and mitigation progress. Strategies provide direction but actions are fundable under grant programs.
- Jurisdictional annexes are included for each participating jurisdiction in Volume II, Section 9.

It should be noted that due to the limitations on participation posed by the pandemic and the strains on time and resources for many local governments and other community organizations from 2020 to present, participation of stakeholders at the municipal level was limited. In accordance with FEMA guiding principles for



inclusive participation at various levels, the planning team will place a high priority on an expanded effort on stakeholder participation with local planning committees in future plan updates.

Table 1-1 indicates the major changes between the two plans as they relate to 44 CFR planning requirements.

Table 1-1. Fort Bend County HMP Changes Crosswalk

44 CFR Requirement	2018 HMP	2023 HMP Plan Update
<p><i>Requirement §201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:</i></p> <ol style="list-style-type: none"> <i>(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;</i> <i>(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and non-profit interests to be involved in the planning process; and</i> <i>(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.</i> 	<p>The 2018 plan followed an outreach strategy utilizing multiple media developed and approved by the Fort Bend Mitigation Planning Committee (MPC). This strategy involved the following:</p> <ul style="list-style-type: none"> • The public received invitations to the Risk Assessment meeting. • Use of a public participation survey. • Planning Phase Newsletters were sent to MPC planners outlining the current phase of plan work. • Stakeholders were identified and coordinated with throughout the process. • A variety of existing studies, plans, reports, and technical information were reviewed as part of the planning process. 	<p>Building upon the success of the 2018 plan, the 2023 planning effort deployed the same public engagement methodology. The plan included the following enhancements:</p> <ul style="list-style-type: none"> • Key department personnel formed a Steering Committee for the plan. • Adjacent communities, along with the County, were invited to participate in the planning meetings. • A website was created on Fort Bend County’s domain to keep the public informed of the planning process and how to get involved. • Draft plan deliverables were made available on the County and multiple City websites, local libraries, and City Hall’s. • All Planning Partnership meetings were open to this public. • Social media was utilized to engage the public. <p>As with the 2018 plan, the 2023 planning process identified key stakeholders and coordinated with them throughout the process. A comprehensive review of relevant plans and programs was performed by the planning team.</p>
<p><i>§201.6(c)(2): The plan shall include a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.</i></p>	<p>The 2018 plan included a risk assessment of hazards of concern. The risk assessment included frequency of return, approximate annualized losses, a description of general vulnerability, climate change impacts, secondary hazards, critical facilities and infrastructure, discussion on vulnerabilities, and future development trends.</p>	<p>The 2023 HMP update includes a comprehensive update to the risk assessment. The flood hazard was expanded to include stormwater flooding (or flooding outside of the floodplain). New and updated hazards of concern were included. Jurisdiction-specific risk assessment results are summarized in Section 4 (Risk Assessment) and in each jurisdictional annex (Section 9).</p>



44 CFR Requirement	2018 HMP	2023 HMP Plan Update
<p><i>§201.6(c)(2)(i): [The risk assessment] shall include a) description of the ... location and extent of all-natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.</i></p>	<p>The 2018 plan presented a risk assessment of each hazard of concern. Each section included the following:</p> <ul style="list-style-type: none"> • General Description • Hazard Location • Previous Occurrences • Hazard Extent and Probability • Impact • Community Drought Vulnerability Summaries 	<p>A similar, but adjusted format, using new and updated data, was used for the 2023 HMP update. Each section of the risk assessment includes the following:</p> <ul style="list-style-type: none"> • Hazard profile, including hazard description and types, maps of extent and location, previous occurrences, and probability of future events • Climate change impacts on future probability • Vulnerability assessment, including impact on life safety and health, general building stock, critical facilities, and the economy as well as future changes that could impact vulnerability • Changes in vulnerability since the 2018 plan
<p><i>§201.6(c)(2)(ii): [The risk assessment] shall include a) description of the jurisdiction’s vulnerability to the hazards described in paragraph (c)(2)(i). This description shall include an overall summary of each hazard and its impact on the community.</i></p>	<p>Vulnerability was assessed for all hazards of concern. Each hazard of concern included a qualitative summary of assets exposed to the hazard.</p>	<p>A robust, quantitative vulnerability assessment was conducted for the 2023 HMP update, using new and updated asset and hazard data. Volume 1, Section 4.3 summarizes the Planning Area’s vulnerability for each hazard of concern. The jurisdictional annexes (Section 9) include a summary table of impacts on both planning partners.</p>
<p><i>§201.6(c)(2)(ii): [The risk assessment] must also address National Flood Insurance Program-insured structures that have been repetitively damaged by floods.</i></p>	<p>A summary of NFIP-insured properties identified as repetitive loss and severe repetitive loss locations were included in each jurisdictional annex.</p>	<p>A summary of NFIP-insured properties identified as repetitive loss and severe repetitive loss locations was included in the plan and each jurisdictional annex.</p>
<p><i>Requirement §201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure and critical facilities located in the identified hazard area.</i></p>	<p>An inventory of the numbers and types of buildings exposed was generated for each hazard of concern.</p>	<p>Quantitative and qualitative analyses were conducted using the updated hazard and inventory data as presented in Section 4 (Risk Assessment). In addition, critical facilities considered lifelines in accordance with FEMA’s definition were identified.</p>
<p><i>Requirement §201.6(c)(2)(ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) and a description of the methodology used to prepare the estimate.</i></p>	<p>Loss estimates were generated for all hazards of concern by using readily available information.</p>	<p>Quantitative and qualitative analyses were conducted using the updated hazard and inventory data as presented in Section 4 (Risk Assessment). Estimated potential losses are reported in both Volume 1 Section 4.3 and Volume II Section 9 for each jurisdiction.</p>
<p><i>Requirement §201.6(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land</i></p>	<p>Future trends in development were not discussed in each jurisdictional annex.</p>	<p>A spatial analysis using identified growth areas, and potential new development identified by jurisdictions was conducted</p>



44 CFR Requirement	2018 HMP	2023 HMP Plan Update
<p><i>uses and development trends within the community so that mitigation options can be considered in future land use decisions.</i></p>		<p>to determine if located in hazard areas. These results were reported to all participants and summarized in their annexes to discuss mitigation measures. In Volume I, Section 4.3, projected changes in population and development are discussed in each hazard section and how these projected changes may lead to increased vulnerability, or plans/regulations/ordinances in place to implement mitigation to protect the development.</p>
<p><i>§201.6(c)(3): [The plan shall include a mitigation strategy that provides the jurisdiction’s blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.]</i></p>	<p>The 2018 plan contained goals, objectives, and actions. The identified actions covered multiple hazards and goals.</p>	<p>The Planning Partnership reviewed and updated the goals and created objectives. A mitigation strategy workshop with associated tools and guidance on problem statement development was deployed to inform the identification of mitigation actions. Actions that were completed or no longer considered to be feasible were removed. The balance of the actions was carried over to the 2023 HMP update, and in some cases, new actions were added to the action plan.</p>
<p><i>Requirement §201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.</i></p>	<p>The Planning Partnership identified goals targeted specifically for this HMP. The planning component supported the actions identified in the plan.</p>	<p>The Planning Partnership reviewed and updated the goals and created objectives. New objectives were identified to align with updated Planning Area priorities.</p>
<p><i>Requirement §201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.</i></p>	<p>For each identified hazard, mitigation strategies were developed and prioritized using mitigation action worksheets. The mitigation actions were displayed in a table, in each jurisdictional annex.</p>	<p>For the 2023 update, a mitigation catalog was developed to provide a comprehensive range of specific mitigation actions to be considered. A table with the analysis of mitigation actions by type and hazard was used in jurisdictional annexes to the plan. Mitigation action worksheets with an alternative project evaluation were prepared for FEMA-eligible projects.</p>
<p><i>Requirement: §201.6(c)(3)(iii): [The mitigation strategy] must also address the jurisdiction’s participation in the National Flood Insurance Program, and continued compliance with the program’s requirements, as appropriate.</i></p>	<p>Many jurisdictions included mitigations action to promote NFIP flood insurance.</p>	<p>For the 2023 update, each jurisdictional annex includes a description on how each jurisdiction participates and implements the NFIP.</p>
<p><i>Requirement: §201.6(c)(3)(iii): [The mitigation strategy shall describe] how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and</i></p>	<p>Each of the actions in this were prioritized based on FEMA’s STAPLEE criteria, which includes consideration of the social, technical, administrative,</p>	<p>A revised methodology based on the STAPLEE criteria and using new and updated data was used for the 2023 HMP update. The 14 criteria were used to</p>



44 CFR Requirement	2018 HMP	2023 HMP Plan Update
<p><i>administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.</i></p>	<p>political, legal, economic, and environmental factors necessary for the implementation of each action.</p>	<p>evaluate each potential mitigation action. The evaluation included a qualitative benefits and cost review. The results of the evaluation were used to identify the actions to include in the plan and assist with the prioritization.</p>
<p><i>Requirement §201.6(c)(4)(i): [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.</i></p>	<p>The 2018 plan details a plan maintenance strategy, giving a suggested schedule on when to review, revise, and maintain the plan.</p>	<p>The 2023 HMP update details a plan maintenance strategy similar to that of the initial plan. However, the 2023 plan maintenance strategy includes the use of the BAToolSM which will enable municipal and county representatives to directly access mitigation initiatives to easily update the status of each project, document successes or obstacles to implementation, add or delete projects to maintain mitigation project implementation.</p>
<p><i>Requirement §201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.</i></p>	<p>The 2018 plan details recommendations for incorporating the plan into other planning mechanisms.</p>	<p>The 2023 HMP update details recommendations for incorporating the plan into other planning mechanisms such as the following:</p> <ul style="list-style-type: none"> • Comprehensive/Master Plan • Emergency Response Plan/ Emergency Operations Plan • Capital Improvement Programs • Municipal Code
<p><i>Requirement §201.6(c)(4)(iii): [The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.</i></p>	<p>The 2018 plan details a strategy for continuing public involvement.</p>	<p>The 2018 plan maintenance strategy was carried over to the 2023 HMP update.</p>
<p><i>Requirement §201.6(c)(5): [The local hazard mitigation plan shall include] documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council).</i></p>	<p>Fort Bend County and all the planning partners have adopted the plan.</p>	<p>The 2023 HMP update achieves DMA compliance for Fort Bend County. Resolutions for each partner adopting the plan can be found in Appendix A of this volume.</p>