

Executive Summary

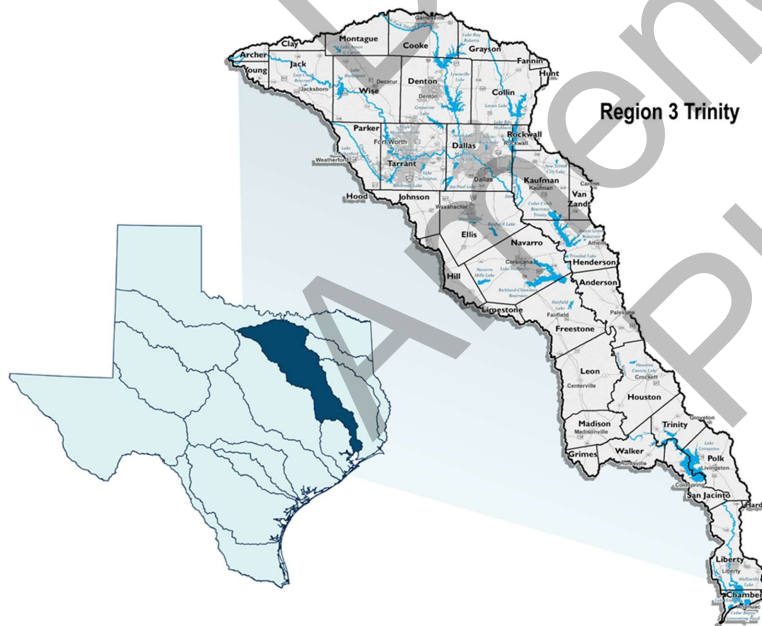
In 2019, the 86th Texas Legislature passed Senate Bill 8 that authorized and established the regional and state flood planning processes. The legislature assigned the responsibility of the regional and state flood planning process to the Texas Water Development Board (TWDB). Under the direction of TWDB, 15 Regional Flood Planning Groups (RFPGs) across the State of Texas, were tasked with developing a regional flood plan for their respective region. This report represents the first-ever Region 3 (Trinity Region) Regional Flood Plan. Through this effort, over \$1 billion in flood risk reduction actions were identified in the Trinity Region.

The Trinity Region encompasses all or part of 38 counties. The region spans a 17,800 square mile area, encompassing 15,855 stream miles. The area stretches from Gainesville, Cooke County in far North Texas all the way to Anahuac, Chambers County at the Gulf of Mexico.

Figure ES.1 ~~Figure ES.1~~ represents the Trinity Region.

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Figure ES.1: Trinity Regional Flood Planning Area



The Trinity RFPG is comprised of 28 volunteers who oversaw and directed the development of this plan. A draft of the Trinity Regional Flood Plan was made available to the public through the RFPG's website in July 2022. The RFPG held a public meeting on July 21, 2022, at which time, they approved the submittal of the Draft Trinity Regional Flood Plan to the TWDB with non-substantive changes. Following the meeting, the Trinity RFPG team addressed comments received, made necessary revisions, and posted a revised Draft Trinity Regional Flood Plan to RFPG's website by the August 1, 2022 deadline. The revised draft was submitted to TWDB and paper copies of the plan were available at three locations within the region:

- Dallas Public Library, 1515 Young St, Dallas, TX 75201 (Dallas County)
- Fairfield Library, 350 W Main St, Fairfield, TX 75840 (Freestone County)
- Sam Houston Regional Library and Research Center, 650 FM 1011, Liberty TX 77575 (Liberty County)

The Trinity RFPG held a public meeting on November 17, 2022 to review the comments received on the draft flood plan. The RFPG finalized and approved the responses to the public and TWDB comments. The RFPG adopted the final flood plan to be amended if all changes were non-substantive and according to the approved responses to comments from the TWDB during the meeting. The Trinity RFPG team made the approved and necessary revisions and submitted the Final Trinity Regional Flood Plan to the TWDB and the public. The final plan was posted to the RFPG's website at www.trinityrfg.org.

In response to concerns regarding the expedited schedule to prepare the flood plans, the TWDB secured additional funding and provided the planning groups an additional six (6) months to prepare and adopt amended plans to incorporate additional flood mitigation actions. The Trinity RFPG held a public meeting on June 29, 2023 at which it (ACTION TAKEN) the adoption and submittal of this Amended Plan with non-substantive changes. The amended plan was submitted to the TWDB and made available to the public on the RFPG website at www.trinityrfg.org by the July 14, 2023 deadline.

Chapters Included in the Plan

The TWDB developed the scope of work as well as technical guidelines that adhere to the legislation for each RFPG to develop its regional flood plan. The plan includes 10 required chapters, plus TWDB-required tables. The TWDB-required tables are included in **Appendix A**.

- **Chapter 1 (Task 1) Planning Area Description**
An overview of the region, including location, economics, agricultural information, social vulnerability, flood-prone areas, historical floods and associated damages, jurisdictions with flood-related authorities or responsibilities, existing infrastructure, and ongoing flood mitigation projects is presented in **Chapter 1**.

- **Chapter 2 (Tasks 2A and 2B) Flood Risk Analyses**

The 1% and the 0.2% annual chance storm event for existing and future conditions is provided in **Chapter 2**. Future conditions are defined as 30 years from the flood planning kickoff, which is approximately the year 2050.

 - **Task 2A Existing Condition Flood Risk Analyses:** This task estimated existing condition flood risk based on information provided by local entities and the public, as well as regional, state, and federal data sources. The best available existing condition flood risk data was stitched together to create a floodplain quilt. Data gaps are identified, as is the region’s vulnerability.
 - **Task 2B Future Condition Flood Risk Analyses:** **Task 2B** assessed potential future flood risk considering two scenarios: (1) a “no action” scenario in which development and population growth continues according to current trends, and (2) an “action” scenario where floodplain regulations are incorporated across the region while development and population growth continues. The future flood risk condition considered multiple potential impacts on flood risk, such as land use, population growth, sea level change, land subsidence, and sedimentation. The RFPG developed an approach to estimate a range of potential future flood risk conditions using a TWDB-approved hierarchy of available data sources.
- **Chapter 3 (Tasks 3A and 3B) Floodplain Management Practices and Flood Protection Goals**

Survey questions related to floodplain management practices within the region were included in the data collection effort in Summer 2021, which the RFPG considered in making its recommendations in this plan. The Trinity RFPG established a Goals Subcommittee that discussed and ultimately recommended the goals presented in **Chapter 3** to the full RFPG.

 - **Task 3A Evaluation and Recommendations on Floodplain Management Practices:** The Trinity RFPG recommended six region-wide floodplain management standards be included in this plan. Entities were encouraged to adopt and implement these standards, however, are not required to do so for their Flood Management Evaluations (FMEs), Flood Mitigation Projects (FMPs), and/or Flood Management Strategies (FMSs) to be included in this plan.
 - **Task 3B Flood Mitigation and Floodplain Management Goals:** The Trinity RFPG established seven overarching goals for this plan. Each goal included at least one specific goal statement with short-term (year 2023) and long-term (year 2053) measurements. Every recommended action to understand or mitigate flood risk must meet at least one of these goals.
- **Chapter 4 (Tasks 4A and 4B) Assessment and Identification of Flood Mitigation Needs**

The RFPG adopted a process to analyze flood mitigation needs and develop potentially feasible actions (FMEs, FMPs, and FMSs) to address these needs.

Task 4A Flood Mitigation Needs Analysis: The scoring criteria to identify the areas of greatest known flood risk and knowledge gaps considered flood-prone areas that threaten life and property, current floodplain regulations, lack of inundation maps, lack of Hydrologic and Hydraulic (H&H) models, emergency needs, existing models, previously identified projects, historical floods, previously implemented projects, and additional factors identified by the Trinity RFPG. The analyses results concluded that approximately two-thirds of the region was inadequately mapped, and that 30 percent of the region contains areas of greatest known flood risk.

Task 4B Classification of Potential FMEs and Potentially Feasible FMSs and FMPs: *Task 4B* identified potentially feasible actions (FMEs, FMPs, and FMSs) that might reduce or mitigate flood risk within the region. FMEs included watershed studies, floodplain mapping, modeling, and preliminary engineering reports. FMPs are flood mitigation projects that could include structural or non-structural solutions, such as detention ponds, bridge improvements, costal protection, easement acquisition and floodproofing. FMS is the “catch-all” category for actions that do not easily fit into the evaluation or project category, such as floodplain ordinance development/update and large buyout programs. Potential actions included those identified by the Trinity RFPG in previous tasks, as well as those provided by local entities. Planning level costs and estimated benefits were also developed for each potential action.

- **Chapter 5 (Task 5) Recommendation of FMEs, FMSs, and Associated FMPs**
The Trinity RFPG established a Technical Subcommittee to review each of the potentially feasible actions and develop lists of FMEs, FMPs, and FMSs for the full RFPG to consider including in this plan. The RFPG applied screening processes to determine the actions for inclusion in this the plan, as well as a tiering system to prioritize requested actions according to those that provided the most complete data required for inclusion in the plan. Approximately A total of 507 340 FMEs, 56 seven FMPs, and approximately 138 40 FMSs were recommended in this regional flood plan.
- **Chapter 6 (Tasks 6A and 6B) Impact and Contribution of the Region Flood Plan**
The Trinity RFPG considered potential impacts of the recommended FMEs, FMPs, and FMSs to upstream and downstream neighbors and adjacent regions, as well as potential impacts to the State Water Plan. Each of the recommended FMPs and FMSs demonstrated no negative impacts on its neighboring communities and was included as a recommended action.

Task 6A Impacts of Regional Flood Plan: The recommended actions were assessed to determine anticipated flood risk reduction and socioeconomic and recreational impacts, as well as environmental, agricultural, water quality, erosion, navigation, and other impacts.

Task 6B Contributions to and Impacts on Water Supply Development and the State Water Plan: The recommended FMPs and FMSs were assessed to determine the potential contribution to or impact on the State Water Plan. The assessment concluded that these recommended actions will not have any anticipated impacts on water supply, water availability, or projects in the State Water Plan.

- **Chapter 7 (Task 7) Flood Response Information and Activities**
Flood response preparation in the region is summarized in **Chapter 7**. The four phases of emergency management were discussed at the local, regional, state, and federal levels. Survey responses regarding emergency management are also summarized.
- **Chapter 8 (Task 8) Legislative, Administrative, and Regulatory Recommendations**
The Trinity RFPG recommended eight legislative ideas to implement the recommended flood mitigation actions. Nine regulatory or administrative regional flood planning process ideas were recommended to provide clarification or updates to statewide concerns. The Trinity RFPG recommended 17 flood planning ideas to improve future cycles of regional flood planning.
- **Chapter 9 (Task 9) Flood Infrastructure Financing Analysis**
Potential local, state, and federal funding opportunities that local sponsors could pursue for the implementation of the recommended FMEs, FMPs, and FMSs are summarized in **Chapter 9**. Results of the surveys soliciting sponsor feedback on recommended actions and potential funding sources are presented.
- **Chapter 10 (Task 10) Public Participation and Plan Adoption**
Throughout the regional flood planning process, the Trinity RFPG incorporated a robust public outreach plan to encourage and solicit local entity and public input, while adhering to the Texas Open Meetings Act and Freedom of Information Act. The development of this plan and its adoption is included in **Chapter 10**.
- **Related Appendices**
The TWDB-required tables and maps, as well as additional details that support information presented in many of the chapters, are included in the appendices.

Please note that **Task 4C** included the preparation of the Technical Memorandum and Technical Memorandum Addendum. Both were approved by the Trinity RFPG and submitted to the TWDB in January and March 2022, respectively, and indicated significant progress in the development of this plan. These two memos served as significant milestones in plan development but now include information that has become outdated. To reduce confusion, these two memos were not included in the regional flood plan although much of the content has been incorporated.

The TWDB guidance required a series of tables that each RFPG is required to include in the regional flood plan. The TWDB will merge these tables to develop the State Flood Plan and corresponding database. TWDB also required specific Geographical Information System (GIS) schema to be submitted electronically as part of this plan. In addition to providing these files to the TWDB, these files were also provided to the General Land Office (GLO), per TWDB's request, to share regional flood data with this state agency which is preparing its own flood mitigation plan along the Texas coast.

Key Findings and Recommendations

Existing and Future Flood Risks

The regional flood plan considered the 1% annual chance storm event and the 0.2% annual chance storm event. The 100-year floodplain represents the area that has a one percent chance of being inundated (or flooded) in any given year. The 0.2 percent floodplain (500-year) floodplain is the area that has a 0.2 percent chance of being flooded in any given year. Both storm events were considered in the existing conditions and future conditions flood risk analyses. The future conditions scenario uses a 30-year time horizon, which is approximately the year 2050.

The Trinity RFPG was tasked with determining and using the best available data within the region. In some areas, the RFPG was able to obtain local flood studies with models and maps. In other areas, localized studies were not available leaving significant data gaps. TWDB provided multiple GIS layers for the region to use as a starting point to fill these gaps and assist with the development of the floodplain quilt. A hierarchy for determining what constitutes "best available data" was developed and is presented in **Table ES.1**. The RFPG applied this hierarchy across the region with local studies typically considered to be the "best available data" depending on quality and moving left to right across the table to the next best option of Federal Emergency Management Agency's (FEMA's) National Flood Hazard Layer data. The RFPG used the TWDB's Fathom data as the most appropriate data when no other suitable data was found. Details about each of these data sources are included in **Chapter 2. Table ES.1** was used for existing and future conditions. The RFPG established a range of potential future conditions that are specified in the table.

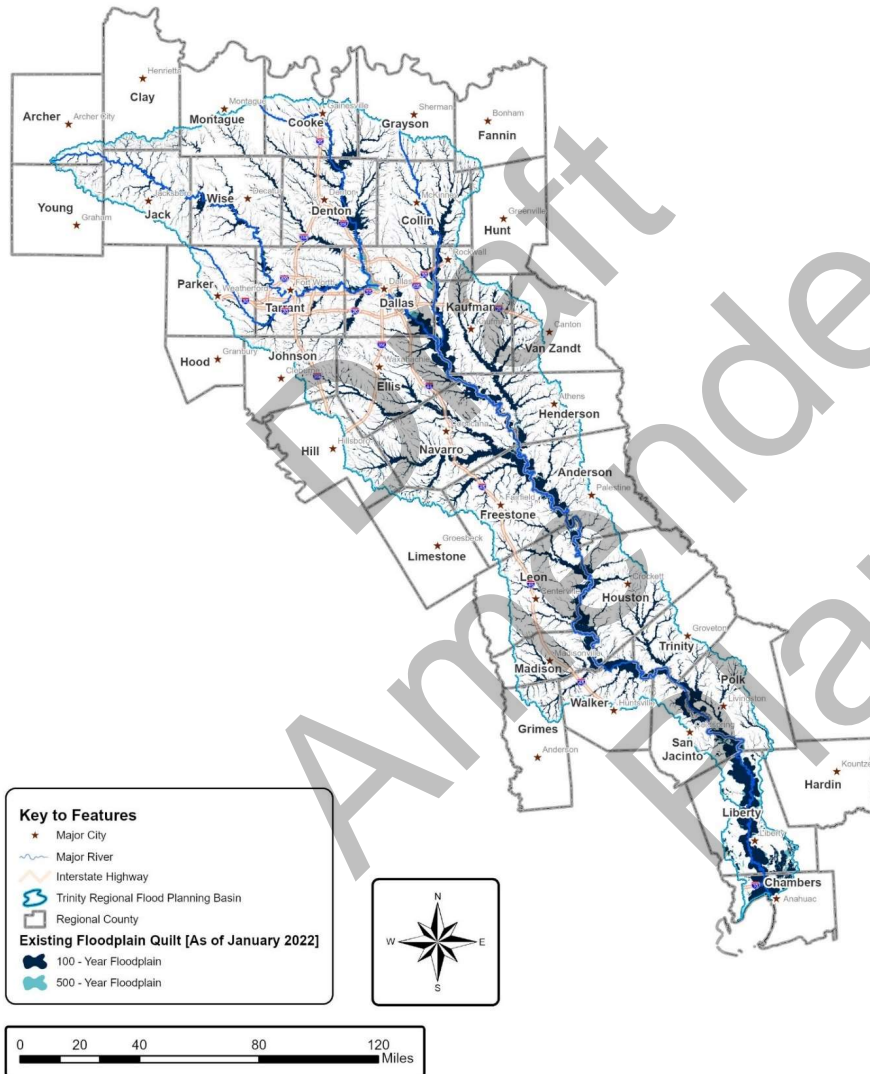
Following the Trinity RFPG's data collection efforts in Summer and Fall 2021, the floodplain quilt was enhanced with local data. The resulting stitching of floodplain layers produced **Figure ES.2**. **Figure ES.2** shows the resulting existing flood risks for the 100-year and 500-year floodplains. This information was applied across the region and was used to identify flood data gaps.

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Table ES.1: Existing and Future Condition Flood Hazard Analysis Approach

	Best Available		→		→		→		Most Approximate			
	100YR	500YR	100YR	500YR	100YR	500YR	100YR	500YR	100YR	500YR		
Existing	Local Floodplain (if determined current)	Local Study (if provided)	Floodplain quilt 100YR	Floodplain quilt 500YR	BLE 100YR	BLE 500YR	NFHL AE 100YR	NFHL AE 500YR	NFHL A / FAFDS 100YR	NFHL A / FAFDS 500YR	No FEMA or Better than Quilt 100YR	No FEMA or Better than Quilt 500YR
	Local Study (if provided)	Local Study (if provided)	Range between Existing 100-year and 500-year	40-foot buffer of the existing 500YR	Range between BLE Existing 100-year and 500-year	40-foot buffer of the existing 500YR	Range between Fathom Existing 100-year and 500-year	40-foot buffer of the existing 500YR	Range between Fathom Existing 100-year and 500-year	40-foot buffer of the existing 500YR	Range between Fathom Existing 100-year and 500-year	40-foot buffer of the existing 500YR
Future	Local Study (if provided)	Local Study (if provided)	Range between Existing 100-year and 500-year	40-foot buffer of the existing 500YR	Range between BLE Existing 100-year and 500-year	40-foot buffer of the existing 500YR	Range between Fathom Existing 100-year and 500-year	40-foot buffer of the existing 500YR	Range between Fathom Existing 100-year and 500-year	40-foot buffer of the existing 500YR	Range between Fathom Existing 100-year and 500-year	40-foot buffer of the existing 500YR

Figure ES.2: Trinity Region Existing Conditions Floodplain Quilt



Existing Condition Flood Risk

As of 2022, all communities within the Trinity region have modernized FEMA digital county-wide effective Flood Insurance Rate Maps (FIRMs), with the exception of Clay, Freestone, and Trinity counties and their respective communities. Counties along or near the Texas coast within the Trinity Region have incorporated recent rainfall data (Atlas 14) developed by the National Oceanic and Atmospheric Administration (NOAA) in their flood risk maps and models.

Existing flood control infrastructure was identified and assessed according to local and statewide data sources. This plan considered a variety of flood control infrastructure, such as dams (reservoirs), levees, detention/retention ponds, bridges, culverts, storm drain systems and other infrastructure designed to impound flood water. When a storm exceeds the design capacity of these types of systems, the result is increased flood risk to life and property within the region.

Potential Flood Impacts Based on Existing Condition Flood Risk

Severe flooding can impact people, property, critical facilities, infrastructure, agricultural production, and more. Critical facilities provide essential services that are vital to a community during and following a disaster.

The Hazus model was used to estimate anticipated flood exposure and damages for existing conditions. The model predicted that 1.32 million people within the Trinity Region would be displaced during a 1% annual chance storm event and the total exposure value of buildings to be \$636.38 billion. The loss of transportation infrastructure was estimated along with water and wastewater treatment facilities. The impacts of flooding on socially vulnerable populations and a community's ability to recover were also assessed in **Chapter 2**. The Hazus model estimated damages and impacts by assuming that the 1% annual chance storm event occurred across the region at the same time.

Future Flood Risk

The Trinity RFPG considered a variety of factors that could exacerbate future condition flood risk, including:

- Future land use/land cover
- Population growth
- Sea level change
- Land subsidence
- Changes in the floodplain
- Major geomorphic changes
- Sedimentation

The RFPG requested local maps and models from communities within the region. Some communities provided this information, but only a few of the communities included future conditions in their mapping and modeling. Since assumptions may vary from one entity to

another when determining future conditions, the RFPG was unable to draw a region-wide conclusion regarding future flood risk based on these few examples.

With so many uncertainties, the Trinity RFPG recommended that the potential future 100-year floodplain be presented as a range between the existing 100-year extents and the existing 500-year extents.

A common method used by cities and regulatory bodies to account for uncertainty of future flood risk is to apply a horizontal buffer area around the stream system or floodplain. The Trinity RFPG performed a case study using nine large-scale studies to determine an appropriate buffer of 40 feet for the region. The range for the potential future 500-year flood risk is a minimum of the existing 500-year floodplain and a maximum of the existing 500-year floodplain plus the 40-foot buffer.

Future flood risk area for the Trinity Region is presented in **Figure ES.3**. The resulting future conditions 100-year and 500-year flood risk areas shown in the future floodplain quilt generally have larger inundated areas than the existing conditions floodplain quilt. The potential future flood exposure and vulnerability analysis consisted of two scenarios:

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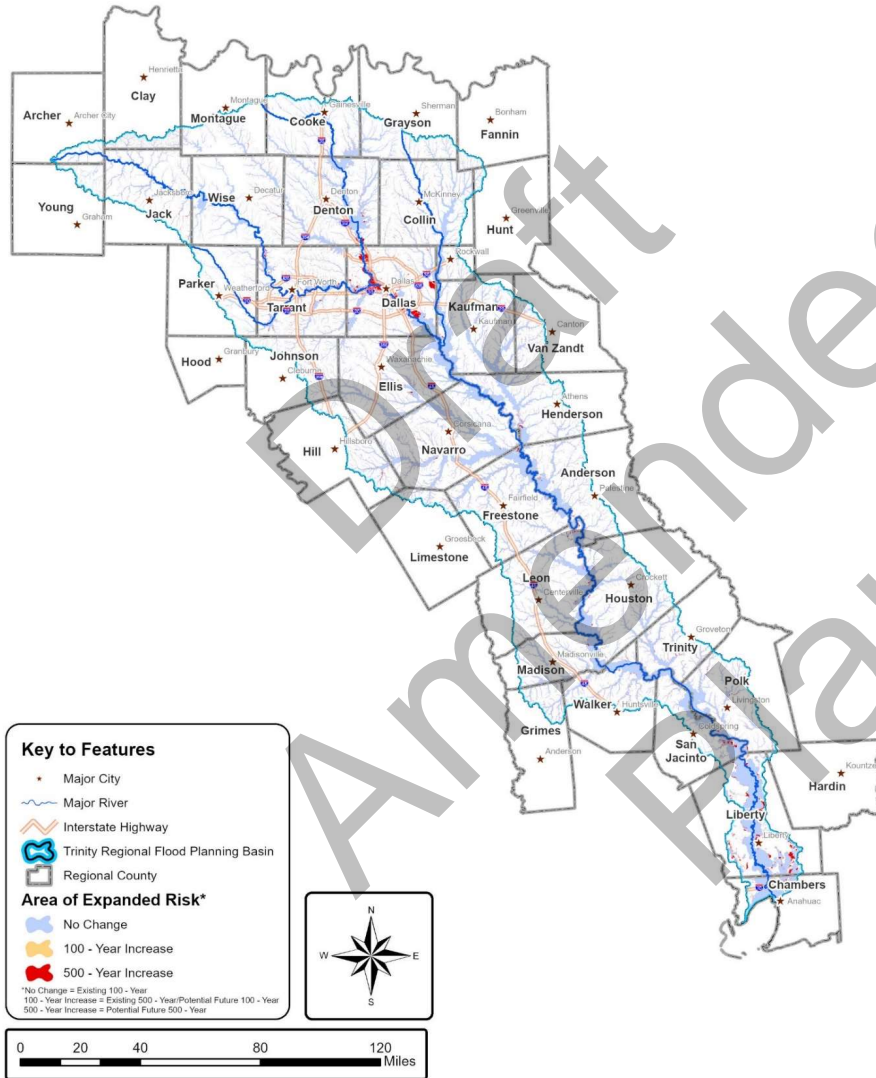
1. Estimating the number of buildings, critical facilities, infrastructure systems, population, and agriculture potentially exposed to flooding by overlaying the future conditions floodplain quilt developed for the Trinity Basin.
2. Estimating additional exposure and vulnerability by identifying areas of existing and known flood hazard and future flood hazard areas where development might occur within the next 30 years if the current land development practices in the Trinity Region continue.

Overall, it is anticipated that 29 percent more structures and 25 percent more people may potentially be impacted by potential future flood risk conditions than existing flood risk conditions.

Identification and Selection of Recommended Floodplain Management and Flood Mitigation Actions

To address the identified flood risks, the Trinity RFPG team developed potential actions to reduce flood risk. Those actions included FMEs, FMPs, and FMSs. FME actions are those that are typically classified as “studies”, such as watershed mapping, modeling and watershed studies that provide potential alternatives to mitigate flood concerns. FMEs also include preliminary engineering reports that more clearly define the proposed action and to determine its viability. FMPs are structural or non-structural projects to mitigate flood risk. The FMS category is intended to capture other types of solutions, such as ordinances, flood early warning systems, buyouts, and more.

Figure ES.3: Trinity Region Potential Expanded Risk between Existing and Future Conditions
Flood Hazard



The Trinity RFPG established a Technical Subcommittee to review the lists of potentially feasible floodplain management or flood mitigation actions and recommend actions that should be considered for inclusion in the regional flood plan to the full Trinity RFPG. The subcommittee met multiple times over several months and evaluated each potential action.

The screening process removed any potential FMEs, FMPs, and or FMSs that did not support a Trinity RFPG goal. If a potential action had already been completed or was no longer a priority for the affected entity/entities, then the potential action was removed from further consideration. Each potential action required a sponsor with an interest in implementing the action. A sponsor could be a city, county, political jurisdiction with flood-related authority or responsibility, or anyone else with an interest in pursuing a specific floodplain management or flood mitigation action.

[For this amended plan, the RFPG solicited new FMPs, FMEs and FMSs for consideration between November 2022 and January 2023. Potential actions assigned to the appropriate category based on the information received. To allow interested sponsors the opportunity for at least on FMP to be included in the plan, the RFPG established a tiering system for FMPs based on the data received. The requests for inclusion were summarized in a work order process that the RFPG approved at its February 2023 meeting.](#)

Selection of Floodplain Management Evaluations

The RFPG analyzed each potential FME following a clearly defined process that included sponsor outreach (when appropriate), likelihood of study/analysis resulting in FMPs in future planning cycles, and development of cost estimates. The RFPG considered potential FMEs submitted by local jurisdictions and others, as well as those prepared by the RFPG team to address areas of greatest need. The RFPG team populated the **TWDB-Required Table 12** and considered these details before making its recommendation to include the FME in this plan.

Selection of Flood Mitigation Projects and Floodplain Management Strategies

Ideally, recommended FMPs and FMSs would address the 1% annual chance storm event. However, some actions cannot attain that level of service for a variety of reasons, such as site constraints, environmental impacts, or cost. The RFPG allowed FMPs and FMSs to be considered for recommendation if the level of service was improved but the 1% annual chance storm event threshold could not be achieved.

FMP and FMS evaluations required a “No Negative Impact” determination for the action to be recommended in the plan. No negative impact means that the project or strategy will not increase flood risk of surrounding properties. In short, the recommended action cannot increase the water surface elevation or flood level above the current elevation on neighboring

properties. In situations where an increase appears to be unavoidable, mitigation measures may be incorporated to alleviate such impacts.

Benefits and cost estimates were prepared for each potential FMP or FMS, when appropriate. That information was used to develop Benefit-Cost Ratios (BCRs) to determine if the benefits of the proposed action exceeded the cost of the action. Because the BCRs were developed using regional data, the Trinity Region decided to recommend FMPs and FMSs despite the results of the benefit-cost analysis. The sponsor for a particular FMP or FMS will be responsible for developing a more detailed BCR using local data according to the requirements established for a particular funding source.

The RFPG team populated the **TWDB-Required Table 13** for potentially feasible FMPs and **TWDB-Required Table 14** for potentially feasible FMSs and considered these details before making a recommendation to include the FMP or FMS in this plan. In situations where TWDB-required information was lacking for a potential project or strategy to be considered for recommendation, then the potential FMP or FMS was reclassified as a recommended FMEs, pending receipt of additional information from the sponsor.

The Technical Subcommittee recommended 507342 FMEs, 567 FMPs, and 1386 FMSs to the Trinity RFPG that were ultimately adopted for inclusion in this plan.

Table ES.2 provides a summary of the types and counts of potential and recommended FMEs. **Table ES.2** provides a summary of the types and counts of potential and recommended FMPs includes information on each of the recommended FMPs. **Table ES.4** summarizes the types and counts of potential and recommended FMSs.

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Ultimately, the Trinity RFPG agreed with the subcommittee’s recommendations and approved the recommended actions at the April and June 2022 Trinity RFPG meetings. The additional flood mitigation actions included in the Trinity Amended Regional Flood Plan were approved during the June 2023 Trinity RFPG meeting.

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Cost of the Recommended Plan

Following the selection of recommended actions to mitigate flood risk, the Trinity RFPG team initiated an email survey to potential sponsors regarding the recommended actions for the entity in the final plan. A one-page summary was developed for each recommended action and sent to the potential sponsor. The Trinity RFPG inquired whether the sponsor agreed with the information presented and confirmed the potential sponsor’s continued interest in the action. For those actions that were of interest to the sponsors, the Trinity RFPG inquired how the entity might fund the action - such as with grants, loans, stormwater utility fees, general budget, or some other means.

This amended plan includes a simplified version of the Financing Survey whereby the RFPG sent an individualized email to each sponsor with the list of actions and an inquiry as to how the sponsor might pay for each action. In the event a potential sponsor did not respond, the RFPG assumed that there was a continued need for action and would require funding assistance for 90 percent of the action’s cost. Overall, the estimated cost to implement the recommended FMEs, FMPs, and FMSs in this plan is \$1,071.6 billion.

Table ES.2: Summary of Flood Mitigation Evaluations

FME Type	FME Description	# of Potential FMEs Identified	# of FMEs Recommended	Total Cost of Recommended FMEs
Watershed Planning	Flood Mapping Updates, Drainage Master Plans, H&H Modeling, Dam and Levee Failure Analysis	160	156	\$89,981,000
Project Planning	Feasibility Assessments and Preliminary Engineering Studies (alternative analysis and up to 30% design)	334	324	\$118,171,000
Preparedness	Studies on Flood Preparedness	5	5	\$3,150,000
Other	Dam Studies	22	22	\$9,260,000
Total		521	507	\$220,562,000

Table ES.3: Summary of Recommended Flood Mitigation Projects

<u>FMP Type</u>	<u>FMP Description</u>	<u># of Potential FMPs Identified</u>	<u># of FMPs Recommended</u>	<u>Total Cost of Recommended FMPs</u>
<u>Infrastructure</u>	<u>Improvements to stormwater infrastructure including channels, ditches, ponds, stormwater pipes, etc.</u>	<u>46</u>	<u>33</u>	<u>\$468,864,000</u>
<u>Storm Drain Improvements</u>	<u>Improvements exclusively to underground urban stormwater infrastructure</u>	<u>14</u>	<u>11</u>	<u>\$38,631,000</u>
<u>Regional Detention Facilities</u>	<u>Runoff control and management via detention facilities</u>	<u>5</u>	<u>4</u>	<u>\$138,099,000</u>
<u>Property or Easement Acquisition</u>	<u>Acquisition of properties located in the floodplain</u>	<u>3</u>	<u>3</u>	<u>\$48,279,000</u>
<u>Dam Improvements, Maintenance and Repair</u>	<u>Dam upgrades to meet TCEQ dam safety requirements</u>	<u>2</u>	<u>2</u>	<u>\$5,565,000</u>
<u>Flood Early Warning Systems</u>	<u>Installation of safety improvements at hazardous stream crossings</u>	<u>2</u>	<u>2</u>	<u>\$640,000</u>
<u>Low Water Crossing or Bridge Improvement</u>	<u>Low water crossing replaced by a bridge crossing</u>	<u>1</u>	<u>1</u>	<u>\$3,319,000</u>
<u>Total</u>		<u>73</u>	<u>56</u>	<u>\$783,397,000</u>

Table ES.4: Summary of Flood Mitigation Strategies

<u>FMS Type</u>	<u>FMS Description</u>	<u># of Potential FMSs Identified</u>	<u># of FMSs Recommended</u>	<u>Total Cost of Recommended FMSs</u>
<u>Education and Outreach</u>	<u>Turn Around, Don't Drown Campaigns; NFIP Education; Flood Education; Dam Safety Education; Floodplain Regulatory Awareness</u>	<u>22</u>	<u>19</u>	<u>\$975,000</u>
<u>Flood Measurement and Warning</u>	<u>Flood Warning Systems; Rain/Stream Gauges and Weather Stations; Low Water Crossings (LWCs)</u>	<u>20</u>	<u>20</u>	<u>\$5,300,000</u>
<u>Property Acquisition and Structural Elevation</u>	<u>Acquire High Risk and Repetitive Loss Properties; Acquire and Preserve Open Spaces</u>	<u>20</u>	<u>20</u>	<u>\$181,545,000</u>
<u>Regulatory and Guidance</u>	<u>City Floodplain Ordinance Creation/Updates; Zoning Regulations; Land Use Programs; Open Space Regulations</u>	<u>62</u>	<u>59</u>	<u>\$86,600,000</u>
<u>Infrastructure Projects</u>	<u>Hazardous Roadway Overtopping Mitigation Program; Citywide Drainage Improvements; Flood-Proofing facilities</u>	<u>5</u>	<u>5</u>	<u>\$430,000,00</u>
<u>Floodproofing</u>	<u>Floodproofing Critical Facilities; Elevating Electrical and Mechanical Equipment; Roof Straps; Storm Shutters; Impact Resistant Windows/Doors; Surge Protection</u>	<u>2</u>	<u>2</u>	<u>\$30,500,000</u>
<u>Other</u>	<u>Debris Clearing Maintenance; Channel Maintenance and Erosion Control; Dam Inspections; Levee Inspections; City</u>	<u>14</u>	<u>13</u>	<u>\$10,489,000</u>

FMS Type	FMS Description	# of Potential FMSs Identified	# of FMSs Recommended	Total Cost of Recommended FMSs
	<u>Parks; Green Infrastructure; Open Space Programs; Nature-Based Solution Planning Studies</u>			
	Total	145	138	\$745,405,000

Public Participation and Outreach

In its inaugural regional flood planning effort, the Trinity RFPG developed a website and an extensive public outreach plan. The website was used to provide information on the planning effort, such as meeting notices, meeting materials, and the posting of draft chapters. Multiple data collection efforts and surveys were accessible through the website. In addition, MailChimp and Twitter were used to notify interested parties about upcoming meetings, surveys, and other Trinity RFPG-related activities.

Most of the Trinity RFPG meetings were held in a hybrid fashion, allowing planning group members and the public to participate virtually. The physical meeting location moved around the region to encourage local, in-person participation.

The series of open houses hosted by the Trinity RFPG team was held in late August 2022 to present the Draft Trinity Flood Plan and to answer basic questions about the flood planning effort. The official public hearing in September 2022 provided entities and the public with the opportunity to submit oral and/or written comments on the Draft Trinity Regional Flood Plan. Written comments were also accepted 30 days prior to and 30 days following the public hearing. These comments were addressed and included as an appendix in the Final Trinity Regional Flood Plan submitted to the TWDB in January 2023.

Immediately after the Trinity RFPG voted to approve the 2023 Region 3 Trinity Regional Flood Plan, the RFPG began soliciting potential FMEs, FMPs and FMSs for consideration in this amended plan through emails and the website. Follow-up phone calls and meetings were scheduled upon request by multiple sponsors. The RFPG continued to meet every other month. The draft amended plan was posted to the RFPG website for public review and comment 14 days in advance and following the June 29, 2023 RFPG meeting at which time the Trinity RFPG (ACTION TAKEN) this amended plan for submittal to the TWDB and the public. Appendix L provides an index listing the revisions to this amended plan.

Texas Administrative Code Guiding Principles and Required Statements

In accordance with Title 31 Texas Administrative Code (TAC) §361.20, the draft and final Trinity Regional Flood Plans conformed with the guidance principles established in Title 31 TAC §362.3. A table of the 39 regional flood planning principles and where they are addressed in this plan is provided in **Chapter 10**. In addition, TAC §361.20 requires the regional flood plan to not negatively affect a neighboring area. The Trinity RFPG performed a No Negative Impact assessment for each potentially feasible FMP and FMS. Those that had or appeared to have a potential negative impact were either reclassified as FMEs for further evaluation or were removed from further consideration and not included as recommended FMPs or FMSs in the Draft or Final Trinity Regional Flood Plan.

The draft and final Trinity Regional Flood Plans and this amended plan were developed in accordance with the TWDB's scope of work and Technical Guidance documents. Specific requirements are discussed in **Chapters 1** through **10**, the appendices, and/or included in the TWDB-required tables or GIS schema.

Statements Regarding Texas Open Meetings Act and Public Information Act Requirements

The Trinity RFPG posted meeting notices and meeting materials in accordance with the Texas Open Meetings Act. Meeting notices were posted on the Trinity RFPG website at www.trinityrfg.org and with the Secretary of State. Prior to the Trinity RFPG website development, the meetings were posted on the TWDB's website and with the Secretary of State.

The Trinity RFPG is subject to the Public Information Act and is required to fulfill requests for information that are not protected by another law. As such, the Trinity RFPG team encouraged entities to only provide information to the planning process that the entity deemed as publicly available information. ~~As of December~~In 2022, the Trinity RFPG received one public request for information through the TWDB. The RFPG team responded that the requested GIS data associated with the draft regional plan was being revised and was not readily available. Per TWDB's instructions, The the RFPG team will provided the revised-draft GIS files with the following disclaimer, "The attached information, including data and models, are planning-level information submitted by the Regional Flood Planning Groups. This data has not been reviewed or approved by the TWDB. The recipient is responsible for confirming the accuracy of the data provided." when they become available.

The team received and responded to all general comments and questions regarding the regional flood planning process and meetings. includes A summary of the questions and

comments received as of June 2022, prior to posting of the draft plan for public review and comment is provided in **Appendix I**. The transcript of the September 2022 Public Hearing where members of the public had an opportunity to provide in-person oral or written comments on the draft plan is provided in **Appendix J**. No comments were received at that Public Hearing. Detailed public and TWDB comments received outside of the Public Hearing and RFPG's responses to each specifically regarding the draft plan are provided in **Appendix K**. **Appendix I also includes general comments and questions received between June 2022 and June 2023.**

Draft
Amended
Plan