

Chapter 7: Flood Response Information and Activities

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7. Flood Response Information and Activities

This chapter provides a summary of emergency management activities across the Upper Rio Grande Region, addressing the preparedness, response, and recovery phases of flood emergencies. Information was gathered based on agency coordination, survey responses, and hazard mitigation planning documents. Survey responses were obtained from the RFP stakeholder survey discussed in *Chapter 10 (“Public Participation and Plan Adoption”)*, through which stakeholders and participants were asked to share the emergency response measures that their jurisdiction currently uses or plans to implement for flood events.

Chapter 8 (“Administrative, Regulatory, and Legislative Recommendations”) included in this Flood Plan offers recommendations by the URGRFPG for consideration by the Texas Legislature, TWDB, TCEQ, other water planning regions and all stakeholders and participants in Texas’ regional and state flood planning efforts which propose new recommendations that could potentially be incorporated as a flood response activity.

7.1 Flood Emergency Management Overview

Emergency management, as defined by FEMA, addresses disasters as recurring events with four phases: Mitigation, Preparedness, Response, and Recovery. Definitions and examples of each phase are listed in the TWDB *Technical Guidelines for Regional Flood Planning* document, as shown in **Table 7.1** below.

Table 7.1 Flood Emergency Management Phases

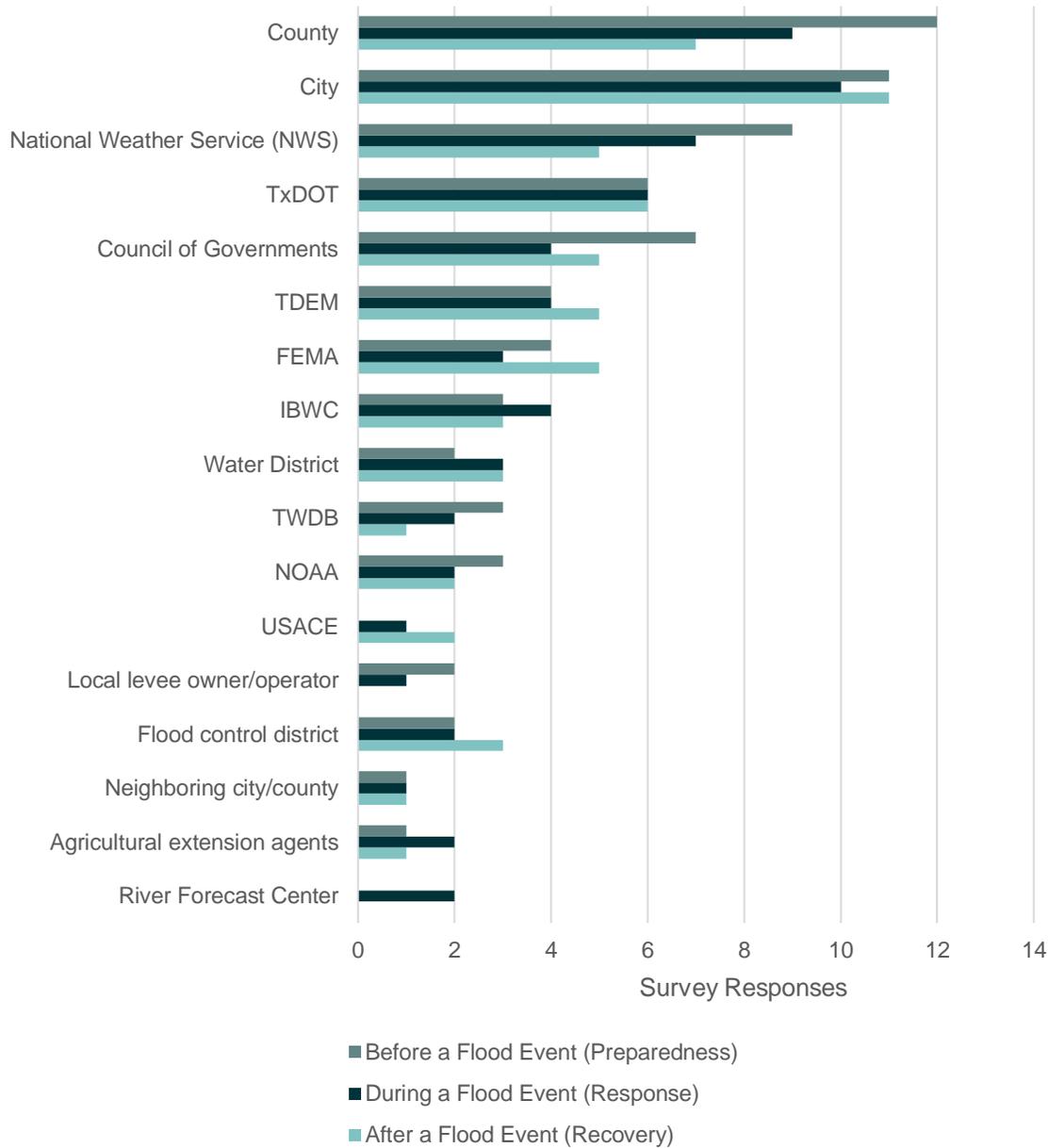
Phase	General Definition	Example Activities (not an exhaustive list)
Flood mitigation	“The implementation of actions, including both structural and non-structural solutions, to reduce flood risk to protect against the loss of life and property.” (Title 31 Texas Administrative Code §361.10(k))	See <i>Technical Guidelines for Regional Flood Planning</i> Section 3.2(2-3) examples of structural and non-structural Flood Mitigation Projects.
Flood preparedness	Actions, aside from mitigation, that are taken before flood events to prepare for flood response activities	Developing emergency management and evacuation plans, preparing staging areas, and building flood early warning systems
Flood response	Actions taken during and in the immediate aftermath of a flood event	Conducting evacuations, providing shelters, closing flooded roads, and operating flood warning systems
Flood recovery	Actions taken after a flood event involving repairs or other actions necessary to return to pre-event conditions	Repairs to damaged infrastructure, storm event debris removal

Flood mitigation is the primary focus of the regional flood planning process with the outcome of identifying and recommending FMEs, FMSs, and FMPs by the RFPG. As discussed in *Chapter 5 (“Evaluation and Recommendation of Flood Solutions”)*, several FMSs and FMPs were also recommended pertaining to flood preparedness, such as the installation of early warning systems and automatic low water crossing road closure gates. The remainder of this chapter

focuses on existing regional activities related to the latter three phases of flood emergency management – preparedness, response, and recovery.

The figure below provides a visual summary on the responses received from the entities regarding the coordination happening before, during and after flood events, which correspond to the preparedness, response, and recovery activities, respectively.

Figure 7.1 Entity Coordination Before, During, and After Flood Event



7.2 Relevant Planning Documents

Chapter 1 Section 1.9 and Appendix 1D of the RFP include a summary of existing planning documents pertaining to the Region 14 flood plan. Several of these documents are relevant to flood preparedness activities, including:

- Rio Grande Council of Governments (RGCOG) Multi-Action Hazard Mitigation Planning (Counties of Brewster, Ector, El Paso, Hudspeth, Jeff Davis, and Presidio)
- El Paso County Hazard Mitigation Action Plan
- City of El Paso High Hazard Dams Emergency Action Plan (EAP)
- Elephant Butte & Caballo Dams EAP
- Federal Flood Assessment Conference Recommendations and Proceedings
- Emergency Action Plan, City of El Paso High Hazard Dams

7.3 Flood Preparedness Activities

Flood emergency preparedness activities include the development of emergency management and action plans, hazard mitigation plans, and the building of flood early warning and alert systems, flood gages, or automatic low water crossings.

Several Emergency Action Plans (EAPs) have been developed for dams throughout the region including the City of El Paso High Hazard Dams EAP (2008), the Red Bluff Dam EAP (2021), and the Elephant Butte & Caballo Dams EAP (2018).

In addition, Hazard Mitigation Plans (HMPs) have been developed for the Counties of Brewster, Ector, El Paso, Hudspeth, Jeff Davis, and Presidio. These HMPs, while primarily mitigation-focused, encourage interregional coordination with key flood planning stakeholders and assist with flood preparedness by reducing emergency response demands during a flood.

In addition to these planning documents, El Paso currently utilizes a flood early warning system based on early warnings provided by a dedicated meteorologist with coordination between EPWater, EPCWID1, and the operators of Caballo Dam in New Mexico. To manage flows along the Rio Grande, the UIBWC has a Water Accounting Division to oversee flow data and assist with reservoir operation criteria during flood events. The U.S. Army Corps of Engineers (USACE) informs communities of the risks of living behind levees by maintaining levee information in the National Levee Database, performing Levee Risk Screening, and communicating the results to sponsors and owners of levee systems as well as the community.

Chapter 5 (“Evaluation and Recommendation of Flood Solutions”) of this RFP includes six recommended FMPs to develop or improve flood early warning systems for the City/County of El Paso and the Cities of Pecos, Alpine, Presidio, Fort Stockton, and Marfa. A general FMS is also recommended for the entire region to prioritize, fund, and develop new flood gages (rainfall and/or stream gages) to support flood warning system improvements. Lastly, an FMP is

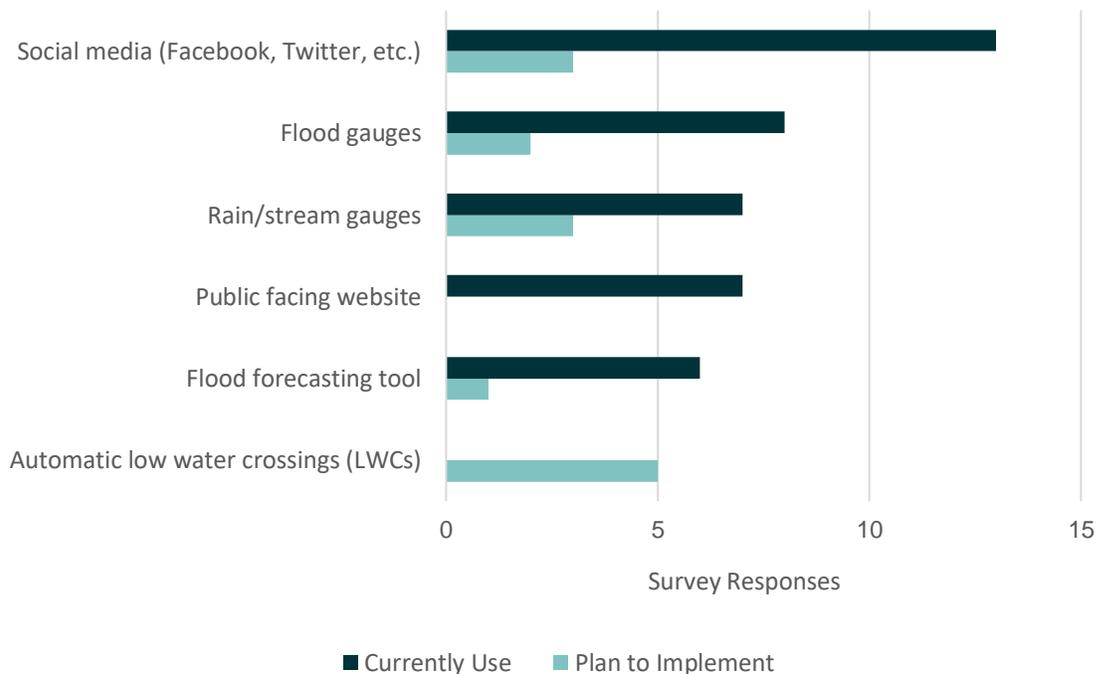
recommended to install automatic low water crossing gates along Alamito Creek in Marfa, including the installation of a monitoring and early detection gage.

A summary of region-specific flood preparedness activities reported through the RFP stakeholder survey is provided in **Figure 7.2**. The majority of the respondents currently use social media as a measure to prepare for flood events, whereas the largest preparedness measure planned to be implemented by respondents is to implement automatic low water crossings.

Communication between entities across the region is essential before, during, and after storm events. While many counties have a Reverse 9-1-1 emergency text system for county residents to receive flood warning messages, there is interest in advancing communication and cooperation across the region to improve the safety of residents of the region and improve the accessibility of emergency response during storm events.

In the City of El Paso, residents at risk of flooding are offered the resource of free sandbags to fortify their properties from flooding when storm events are anticipated for the city. While this is a temporary solution to their need for infrastructure improvements, it has served as a tangible community education activity. Public understanding of flood risk is an important component of increasing the resiliency of the community from the risks of flood related injuries.

Figure 7.2 Flood Preparedness Measures Used by Survey Respondents



Additional information is provided below regarding the National Weather Service (NWS), National Oceanic and Atmospheric Administration (NOAA), and the El Paso County Hazard Mitigation Plan.

National Weather Service (NWS) and NOAA

The NWS is currently in the process of implementing Flood Early Warning System (FEWS) flood forecast system, called the Community Hydrologic Prediction System (CHPS). NOAA/NWS RFCs are emphasizing development of improved streamflow routing with the use of dynamic, unsteady streamflow routing, including near real-time event-based flood inundation mapping, within CHPS. This is a more reliable and accurate way to understand the behavior of flood patterns to anticipate when these will occur.

NOAA Flood Safety Awareness Safety & Preparedness

The NOAA’s page includes information about safety awareness and preparedness. Good preparation and knowing what to do in a flood will increase people’s safety and chances of survival. It can also help minimize potential flood damage and accelerate recovery efforts. The Flood Safety Brochure offers information to public on what to do before, during, and after a flood.

El Paso County Hazard Mitigation Action Plan

The El Paso County Hazard Mitigation Action Plan identifies several flood hazards throughout the county and has developed mitigation actions. These actions are listed in Table XXXX below and provide additional information related to the county’s flood preparedness goals and current activities.

Table 7.2 El Paso County Hazard Mitigation Plan – Major Actions

Type	Action
Dam Failure	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.
Dam Failure	Acquire and install generators with hard wired quick connections at all critical facilities.
Dam Failure	Harden/retrofit critical facilities to hazard-resistant levels.
Dam Failure	Create a map of inundation for the County operated Dams.
Dam Failure	Create an alert system for residents notifying them of potential dam failure.

Type	Action
Dam Failure	Implement the recommendations of the El Paso City / County EAP regarding dam safety.
Dam Failure	Enhance the area-wide Emergency Notification System (Everbridge).
Dam Failure	Install and update EZInet at the 911 Communication Center. It will allow for the organization upgrade from Enhanced 911 (E911) to Next Generation 911 (NG911).
Dam Failure	Develop alternative evacuation routes/plans and designate emergency thoroughfares, particularly in areas with limited capacity. Educate citizens on evacuation routes and procedures.
Dam Failure	Distribute NOAA bulletins.
Flood, Dam Failure	Inspect and implement building requirements for critical infrastructure buildings to be protected from natural hazards. Harden/retrofit critical facilities to hazard-resistant levels.
Flood, Dam Failure	Create an evacuation plan in case of dam failure or flooding condition
Flood, Dam Failure	Acquire/relocate new public buildings to be out of high hazard areas.
Flood	Create a comprehensive map with identified hazards and potential alert zones.
Flood	Inspect, monitor, and educate owners of arroyos (drywashes) to prevent illegal dumping, remove overgrown vegetation and re-establish flow paths within private property.
Flood	Update 2010 Storm Water Master Plan.
Flood	Implement/construct projects identified by storm water master plan.
Flood	Upgrade alert systems and notification to the public at low water crossings.
Flood	Improve current programs for clearing debris from drains, culverts, and ponds by purchasing new equipment.
Flood	Increase drainage capacity, add stormwater detention and/or retention basins as deemed necessary to reduce flood risk.

Type	Action
Flood	Reduce urbanized flooding conditions by creating channels and upgrading pump stations to remove standing water.
Flood	Require that electric utility lines be buried when new roads are constructed or reconstructed.
Flood	Adopt and enforce ordinance that meet minimum Federal and state requirements to comply with NFIP.
Flood	Stabilize arroyos in steep locations and that show signs of erosion with native vegetation.
Flood	Acquire and demolish repetitive loss properties. Acquire high risk vacant land and maintain as open space.
Flood	Excavate stormwater detention basins to increase capacity.
Flood	Increase capacity for conveyance of stormwater away from areas of ponding.
Flood	Update Flood Damage Prevention Ordinances when new FIRMs are adopted (new preliminary FIRMS are currently under review).
Flood	Adopt and implement a routine tree trimming program that clears tree limbs near power lines and/or hanging in right-of-way; Remove dead trees from right-of way and drainage systems on a scheduled basis.
Flood	Acquire and install generators with hard wired quick connections at all critical facilities.
Flood	Maintain certification in the National Weather Service Storm Ready Program
Flood	Remove dead trees from right-of way and drainage systems on a scheduled basis. Maintain Ponding area for proper drainage.
Flood	Educate community on the dangers of low water crossings through the installation of warning signs and promotion of "Turn Around, Don't Drown" Program.
Flood	Undertake a comprehensive drainage study for the Socorro/San Antonio St. area
Flood	Upgrade stormwater system in high-risk areas throughout the city.

Type	Action
Flood	Construct regional pond in a portion of 1445 San Antonio St. Implement drainage improvements such as drainage inlets, approximately 740-ft of 30-inch reinforced concrete pipe (RCP) storm sewer system, pavement replacement, perimeter fencing, and an access driveway. The capacity of this public regional pond is 11.54 Ac-ft, which completely retains the total expected storm water flow of 10.4-Ac-ft from a 100-year storm event.
Flood	Update Flood Damage Prevention Ordinances when new FIRMs are adopted (new preliminary FIRMS are currently under review).
Flood	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.
Flood	Incorporate higher standards for hazard resistance in local application of the building code.
Flood	Implement a flood awareness program by providing FEMA/NFIP materials to mortgage lenders, real estate agents and insurance agents and place them in local libraries.
Flood	Adopt regulations to limit amount of impervious cover in conjunction with new development.
Flood	Incorporate requirements to ensure stormwater infrastructure is added to all roadway projects.
Flood	Increase drainage capacity; add stormwater detention and/or retention basins as deemed necessary to reduce flood risk.
Flood	Add requirement to Building Permit application that applicant signify whether the location is part of a Special Flood Hazard Area.
Flood	Require that electric utility lines be buried when new roads are constructed or reconstructed.
Flood	Improve stormwater drainage through enhanced maintenance.
Flood	Trim or prune trees along roadways to prevent interference with power lines during high winds.

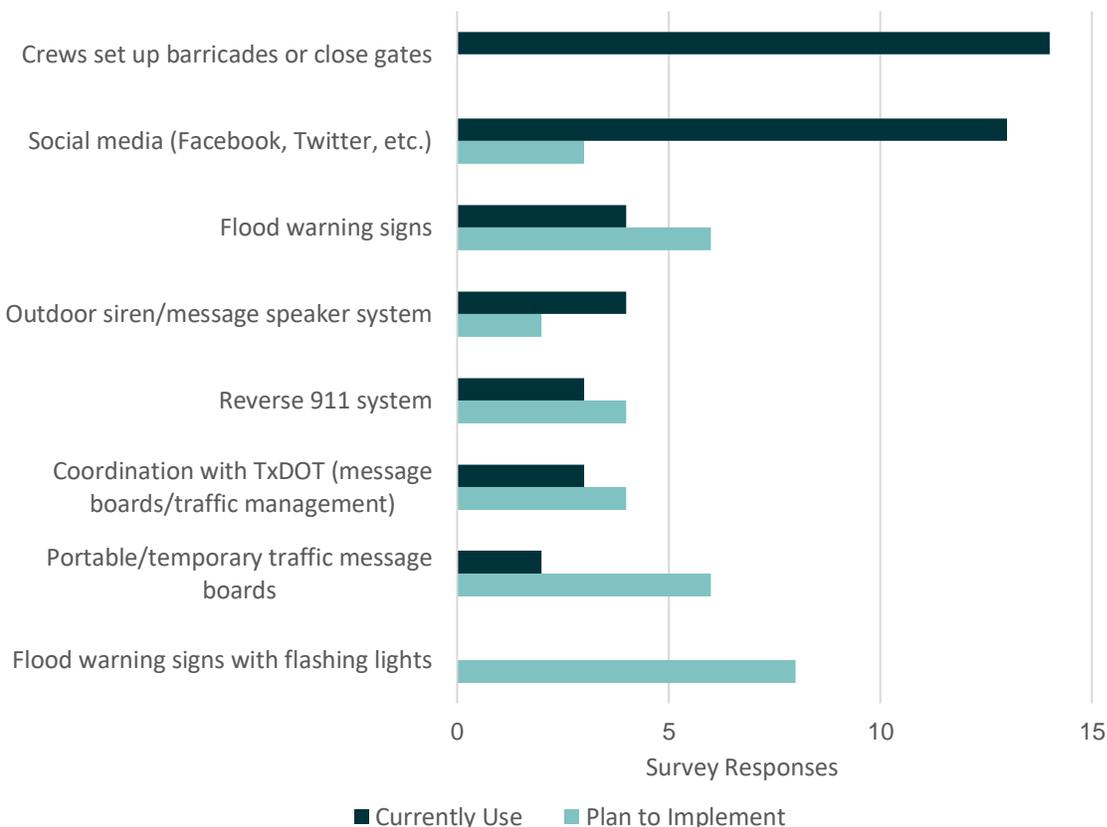
7.4 Flood Response Activities

In response to flooding emergencies, several communities in the region reported using a public alert or alarm system to broadcast alarms via an outdoor siren or send notifications via text messaging, website, or social media. Based on information provided through the RFP stakeholder survey, the City of Pyote uses a public alert system, Crockett County utilizes alarms and texting notifications, City of Sonora uses the Nixle Alert system, and the Town of Horizon uses a flood warning system through notifications on the City website and social media.

Cities and counties coordinate with the Texas Department of Transportation (TxDOT) on road closures and traffic message boards. Emergency managers rely on publicly available information from the National Oceanic and Atmospheric Administration (NOAA), the National Weather Service (NWS), and the United States Geologic Survey (USGS). The Bureau of Reclamation El Paso Field Division (EPFD) works with offices and divisions from New Mexico to regulate releases from the Elephant Butte and Caballo Dams to minimize flows during a flood event.

A summary of region-specific flood response activities reported through the RFP stakeholder survey is provided in **Figure 7.3**.

Figure 7.3 Flood Response Measures Used by Survey Respondents



7.5 Flood Recovery Activities

Flood recovery activities most often include debris removal from culvert entrances and bridges by cities, counties, and TxDOT. Due to the region's arid landscape, sedimentation from arroyos is a common issue after floods, especially in El Paso where arroyos from the Franklin Mountains frequently deposit sediment impacting downstream culverts, roadways, agricultural land, and irrigation system infrastructure. In the event of significant flood damages, flood damage assessment and recovery efforts are supported with assistance and resources by FEMA Region VI and the Texas Division of Emergency Management (TDEM) Region 4. The roles of each of these agencies are described in further detail below.

FEMA National Disaster Recovery Framework

The National Disaster Recovery Framework (NDRF) enables effective recovery support to disaster-impacted states, tribes, territorial and local jurisdictions. The primary value of the NDRF is its emphasis on preparing for recovery in advance of disaster. It is always in effect, and elements can be implemented at any time. They focus on the following factors that can help ensure a more effective recovery process:

- Comprehensive Scope
- Effective Decision-Making and Coordination
- Integration of Community Recovery Planning Processes
- Well-Managed Recovery
- Proactive Community Engagement, Public Participation, and Public Awareness,
- Effective Financial and Program Management
- Organizational Flexibility
- Resilient Rebuilding
- Health Integration

The FEMA Region VI Mitigation Division's role includes the following items:

- To assist the local governing bodies in recording and assessing the location and extent of damages from the extreme weather event in the declared disaster area(s).
- To provide recommendations for actions to take following a storm event. As part of their recommendations as part of recent Federal Flood Assessment Conference Recommendations and Proceedings (documented in Chapter 1 Appendix Table 1D), FEMA Region VI's assessment team made the following recommendations:
 - That horizontal vertical control data be gathered and compiled for identified high water mark locations
 - That a flood inundation map or a map indicating the areas that received flood damage be developed
 - That areas that received severe flooding damage, and especially areas that are experiencing growth and development and/or re-development, be studied using technical hydrology and hydraulic floodplain analysis to determine appropriate velocities, potential flooding problem locations and flooding depths

- That flood frequencies be determined by damage center location or drainage basin for approximately 10 locations, based on the most intense storm of that area

Texas Division of Emergency Management (TDEM)

The Texas Division of Emergency Management (TDEM) coordinates the state emergency management program, which ensures the state and its local governments respond to and recover from emergencies and disasters and implement plans and programs to help prevent or lessen the impact of emergencies and disasters. TDEM implements programs to increase public awareness about threats and hazards, coordinates emergency planning, provides an extensive array of specialized training for emergency responders and local officials, and administers disaster recovery and hazard mitigation programs in the State of Texas. Some of the response and short term activities provided are as follows:

- EOC support upon request
- Assist EMC with short/long-term recovery needs
- DSO development assistance
- Debris management guidance
- Disaster finance guidance
- Procurement and contract guidance
- LTRG, COAD and VOAD engagement
- Volunteer and donations management support
- Mass Care (evacuation/sheltering)
- Road assessment and repair prioritization assistance
- Damage assessments (rapid/self-reporting survey)
- Facilitate collection of damage data through multiple platforms
- Facilitate transfer of damage data to TDEM Recovery Coordinators to streamline potential Joint Preliminary Damage Assessments with federal partners post-disaster