





## Introduction

This emergency management section of the report addresses the City's ability to prevent and respond to natural and man-made disasters. This is an essential function of a healthy city and is critical in ensuring the safety and vitality of the community and its residents. This section of the Plan directly impacts the "safe" vision theme of the community. Additionally, the "collaborative" vision theme is directly affected as effective emergency management will require the cooperation of all entities throughout the City. The Plan's impact on the other vision themes of the Comprehensive Plan may be viewed in Figure 1.

## Objectives

1. Want to control risk and minimize exposure from natural and man-made risks uniformly throughout the community
2. Want sufficient, reliable, and qualified natural/man-made disaster preparation/planning and response service capacity to meet current and future demand uniformly throughout the City

	DIRECT	INDIRECT
PROSPEROUS		•
EFFICIENT		•
FUNCTIONING		•
SAFE	•	
TALENTED		
HEALTHY		•
LIVABLE		•
VIBRANT		•
ENGAGED		•
COLLABORATIVE	•	
EQUITABLE		•
SUSTAINABLE		•

Figure 1. Vision Themes Related to the Emergency Management Plan

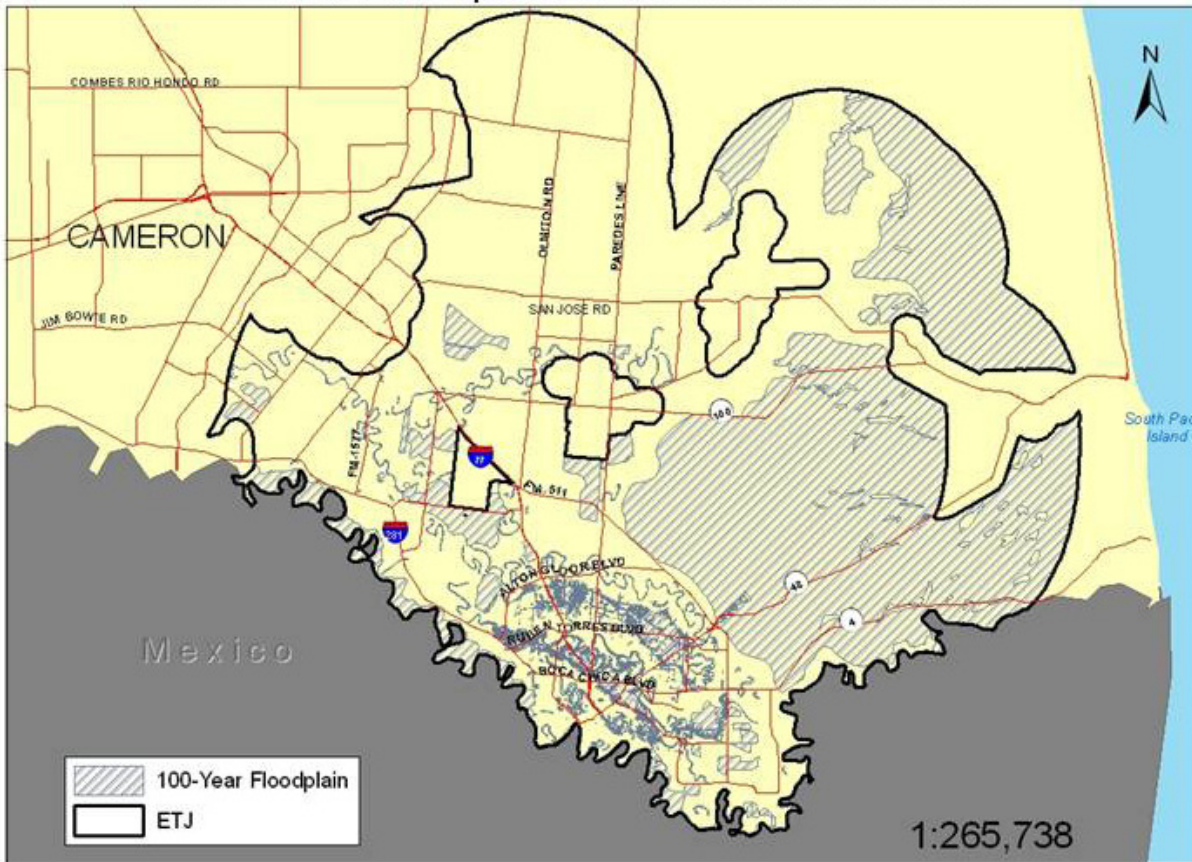


Figure 2. 100-Year Floodplain in the Brownsville ETJ.



## Gaps / Key Issues

1. A significant portion of Brownsville’s ETJ is located within both 100-year floodplain and hurricane risk zone boundaries. This makes the City susceptible to large-scale flooding due to rainfall and storm surge, as well as wind damage from hurricanes.

The proximity of the City of Brownsville to the Gulf Coast and the Rio Grande River, combined with low elevations, flat slopes, and poorly draining soils, makes large-scale regional flooding from extreme rainfall and/or hurricane events a serious concern throughout the majority of the City. It is estimated that approximately 41% of the ETJ area is within the 100-year floodplain (Figure 2). Furthermore, portions of that area are currently developed and includes key areas like the airport, the fire/EMS station at 1855 Capt. Donald Foust,

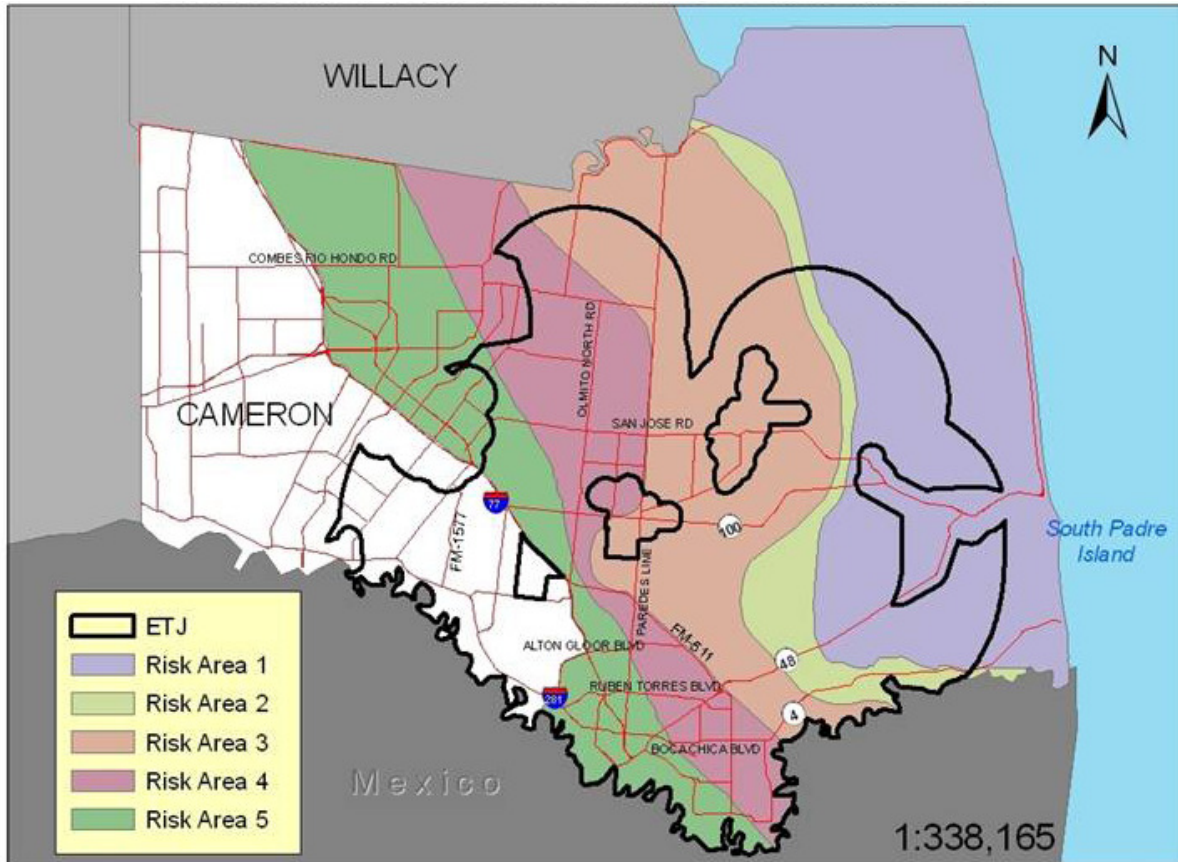


Figure 3. Hurricane Risk Areas in the Brownsville ETJ.

Zone	Area Within ETJ (Sq Miles)	% of ETJ Area
Risk Area 1	98	19
Risk Area 2	41	8
Risk Area 3	145	27
Risk Area 4	107	20
Risk Area 5	65	12
<b>Total</b>	<b>456</b>	<b>86</b>
<b>Total Area of ETJ</b>	<b>530</b>	<b>100</b>

Figure 4. Hurricane Risk Area Land Percentages.

and primary roadways. This presents a serious threat to the safety of the community and could cause major issues in terms of post-flooding disaster evacuation efforts.

In addition to a large portion of the City being located within the 100-year floodplain, Brownsville is also largely within a Hurricane Risk Zone. The hurricane risk area map displayed in Figure 3 illustrates the likely extent of impact for a given intensity hurricane. For example, the purple area within Risk Area 1 illustrates the likely area of impact that a category 1 hurricane would have on the Brownsville ETJ. Figure 4 shows the percent ETJ area within each respective Risk Area. It may be noted that for a Category 5 hurricane, an overwhelming 86% of the City's ETJ lies within a Risk Area.

2. The current anticipated demand for emergency evacuation assistance exceeds the City's capacity.

Due to the fact that a large area of the City's ETJ is within both a 100-year floodplain and a Hurricane Risk Area, mass evacuation is an event that the City needs be prepared to handle. Current estimates of the City's capacity to evacuate those residents needing assistance for a major hurricane are approximately 20-33%. This range is based on the number of people that are estimated to require assistance during evacuation due to medical restrictions or lack of transportation versus the City's capacity in terms of personnel, high profile vehicles, rescue boats, and other relevant equipment needs.

3. There is currently a lack of backup power to operate critical infrastructure and municipal buildings during power outages caused by a natural and/or man-made emergency.

Currently, there is no backup power supply for the majority of lift stations throughout the City and for municipal buildings. This could potentially become problematic during post-disaster/recovery operations and could limit the City's ability to respond to and manage emergency response. This also poses a health concern due to the possibility of lift stations backing up.

4. Brownsville currently has only two evacuation routes out of the City and congestion is increased by border traffic.

Due to the geographic location of the City, with the Gulf of Mexico lying east of the City, Mexico to the west/southwest, and coastal regions to the north, evacuation from the City is limited to the northwest. Currently, there are only two continuous roadways leading out of the City in this direction: US 77/83 (six lanes), continuing on to US 83, and Highway (Hwy) 281 (two lanes). While US 77/83 and US 83 are both well-maintained freeways with no stop lights or intersections with small roadways, Hwy 281 is an older road in need of maintenance and/or resurfacing. Hwy 281 passes through several small towns and intersections which make evacuation along this roadway much slower. Furthermore, this roadway parallels the Rio Grande River and could be subject to flooding if the water elevation of the River rises above the banks. Further complications include the amount of traffic from the border that causes additional strain on the roadway system, as well as on personnel assisting with evacuation.



## Strategic Initiatives

The Emergency Management Plan presented below consists of both capital improvement projects (CIP) and programmatic elements. The Plan seeks to complement the City's existing emergency management and response plan and identify strategies that would help City staff provide better, more effective, and sustainable services for mitigation, response, and recovery from both natural and man-made disasters. The CIP and programmatic strategies presented address the two major objectives discussed at the beginning of this section.

1. Invest in additional emergency equipment and personnel.

This strategy involves the purchase of emergency evacuation and response equipment that would better enable the City to respond to natural

and/or man-made disasters. Equipment needs include: generators for lift stations and municipal buildings, storm shutters for municipal buildings, rescue boats, and additional high profile vehicles. Purchasing of specific items should be evaluated by the emergency management subcommittee of the task force, in conjunction with the emergency manager, to ensure that the most critical and effective investments are given priority. While the cost of investing in additional emergency response equipment and personnel will vary depending on specific priorities and equipment models, it is estimated that a budget of approximately \$500,000 - \$750,000 will be required.

2. Limit and/or put special restrictions on development within the 100-year floodplain and hazardous material transport corridors.

Development within the floodplain and hazardous material transport corridors throughout the City

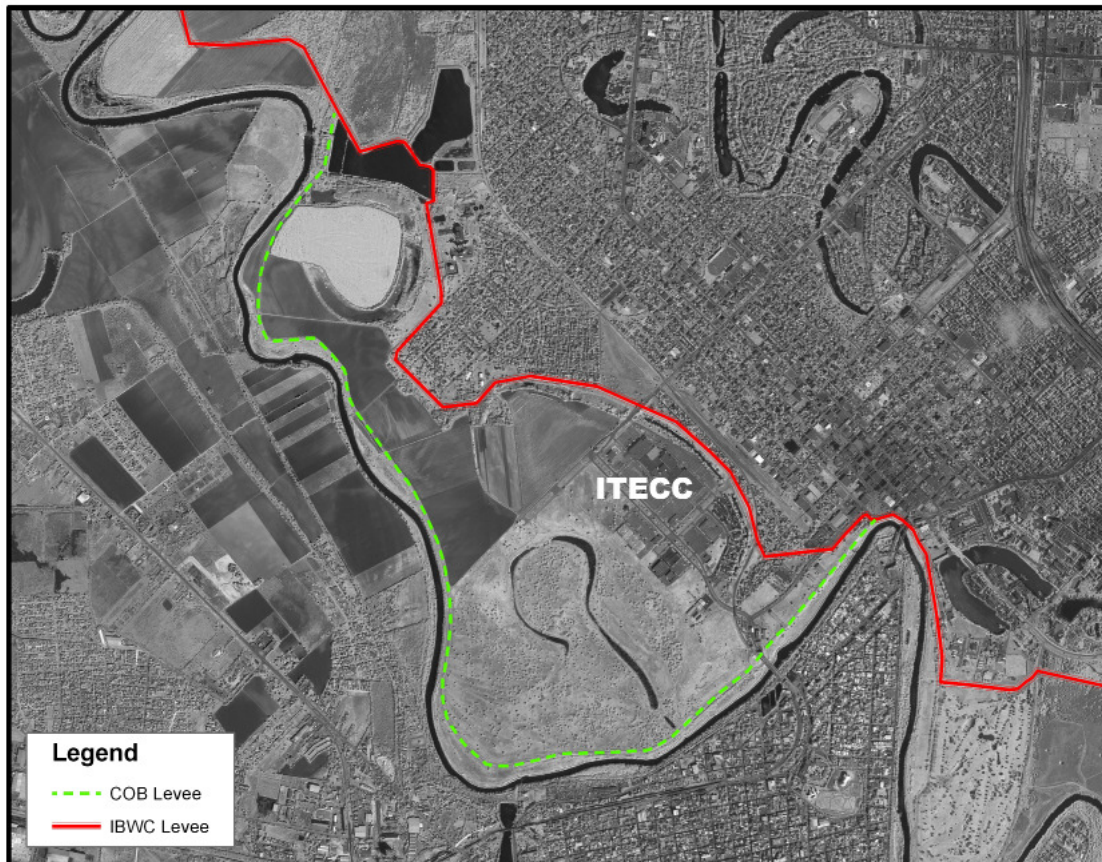


Figure 5. Levee System within Brownsville.

is a threat to human health and safety, as well as an economic threat. This strategy would limit all future residential, commercial, and industrial development within the 100-year floodplain. The region within the large floodplain areas should instead be limited to public facilities, such as parks and/or multi-use detention ponds as described in the Future Land Use Plan. Furthermore, all residential development should be constructed within a safe distance of any hazardous material transport corridor.

3. Improve the City levee and coordinate with IBWC to certify and abandon existing IBWC levee that isolates the ITECC portion of UTB/TSC from the rest of the City.

Since Hurricane Katrina ravaged the Louisiana coast in 2005, there has been much discussion of the integrity of the levees in Brownsville and the rest of the Rio Grande Valley. While levee improvements and maintenance come with high price tags, the integrity of our levee system is of extreme importance and needs to be addressed. Another issue in regard to the Federal Border Wall is the matter of the existing IBWC flood levee's placement north of UTB/TSC's ITECC. By improving and certifying the City / Amigoland levee (Figure 5) with IBWC, the City levee could replace the current IBWC levee. This would provide protection to the ITECC campus in cases of rising flood stage in the Rio Grande from storms and/or hurricanes. The City levee would tie into the existing IBWC levee at the Veteran's bridge on the southeastern end and near the Water Treatment Plant at the northwestern end. The entire length of levee that would require improvement is approximately 3.4 miles.

This project would link to the downtown Riverside development project discussed in the Downtown Section of the report. While the cost of this project could vary contingent on the specific requirements of IBWC to certify the levee and the existing condition/stability of the levee, it is estimated that the cost would be approximately \$50 million.

4. Develop a public awareness/education program that emphasizes self-preparation for disasters.

One of the biggest challenges with emergency management is informing the public of what is happening and how to respond. A public awareness and education program would serve to inform the public on standard precautions to be taken during emergency situations, what to expect during evacuation, when evacuation should occur, etc. The program should include the creation and dissemination of informational pamphlets and development of Community Emergency Response Teams (CERT). The development of a CERT involves recruiting members of the community and educating them about disaster preparedness and basic disaster response skills. These teams will then be equipped to provide information on preparedness and evacuation procedures to other community members and possibly assist with basic response and recovery functions. The steps required to start a program include:

- Identify the goals of the CERT program that will be initiated and assess the resources available to conduct the program.
- Gain approval from City officials to use CERT as a means to prepare citizens during a disaster.
- Identify and recruit potential participants, including community groups, business and industry workers, and local government workers.
- Train CERT instructor cadre.
- Conduct CERT sessions.
- Conduct refresher training and exercises with CERTs.

External funding sources that could be investigated for the project include FEMA or the Federal "Safe Schools" program if the CERT is created within a school district. While these funds are often available for starting a program, maintenance of the program will typically require a permanent source of funding. Additionally, funding sources and/or in-kind donations could be solicited from corporations, businesses, and service organizations. More information about initiating a program can be found on:

<http://www.citizencorps.gov>.



## 5. Improve drainage at the airport.

In addition to being located in Hurricane Risk Area 4, the Brownsville airport is also within the 100-year floodplain and has been repeatedly flooded during previous major rainfall events. Flood damages have cost the City in the past and will continue to incur costs in the future. Flooding of the airport also weakens the City's ability to respond to emergencies and creates an impediment to recovery activities after an event. Specific drainage capital improvement projects at the airport are included in the Drainage Plan of this report and are estimated to cost approximately \$6 - \$6.75 million.

## 6. Update evacuation/emergency management study.

To help the City better prepare for emergency response and recovery activities, it is imperative that the City have an accurate assessment of how many people will need assistance during evacuation events, how many people the City will have the ability to evacuate within a reasonable amount of time, and the adequacy of available personnel, equipment, and evacuation routes and shelters. One of the specific items that should be investigated is the adequacy of the number of highway lanes available during evacuation and possible improvements of Military Highway (Hwy 281) on the west side of Brownsville to improve the evacuation capacity of that roadway.

## 7. Develop and invest in a warning/monitoring system for predictable natural disasters.

This strategy would implement technological advancements for real-time monitoring of water elevations in drainage systems throughout the City. The system would use rainfall gauges, rainfall radar data, flow gauges, predicted flood stages based on hydrologic/hydraulic computer model output, and cameras that would allow for remote visual inspection of water levels. These would all be linked through a server to allow for remote inspection of predicted and existing rainfall, flow, and water surface levels to facilitate effective planning and preparation. The system could be used in conjunction with or linked to the

Brownsville Irrigation Districts SCADA system to facilitate decision-making regarding when and if water levels in reservoirs should be lowered prior to a rainfall event. The system would also allow for decision making with regards to evacuations, based on predicted storm stage relative to bank heights. The cost of implementation will vary depending on the number of rain gauges and stream gauges added to the system, and the need or desire for expansion of the SCADA system, but it is anticipated to cost from \$400,000 - \$600,000.

## 8. Create a mechanism for people to dispose of toxic household materials at the dump (or some other designated location) before incoming hurricanes to minimize exposure to hazardous materials/polluted floodwaters after a flooding event.

Another major problem revealed during Hurricane Katrina in 2005 was the significant health and safety hazard posed by the mixing of hazardous household/commercial waste during flood events. During the flooding event, this waste spilled/leaked into the flood waters and created a significant safety risk for those stranded in floodwaters and those involved with recovery activities. The concept of this strategy is to provide a means for people to properly dispose of potentially hazardous material that they may be storing in their homes/offices prior to a hurricane/major rainfall event. In order for this strategy to be effective, it should be paired with an education and outreach effort.

## Implementation

The overall implementation of the emergency management strategies will be initiated by the appropriate division of the Task Force, including the City's emergency manager and representation from an elected City official. Efforts should be coordinated with other Public Safety offices (Fire/EMS) as well as the City Fleet administrator, Public Works, CCDD1, Brownsville Irrigation District, and any other local entity that may or should be involved with emergency planning efforts and have similar equipment needs.



